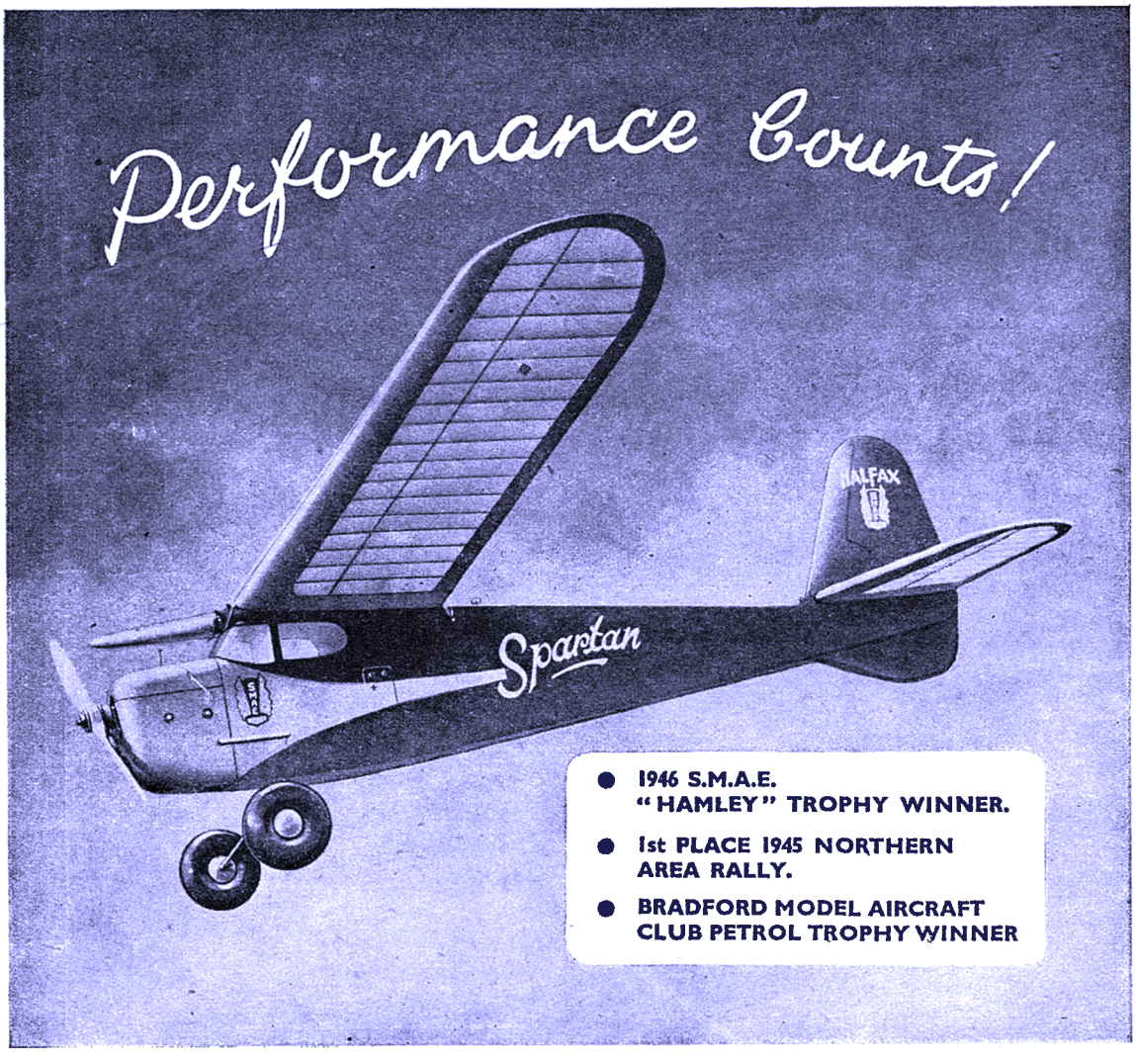
FEB
1947

# AEROMODELLER

1/3

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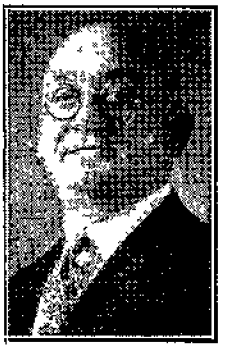

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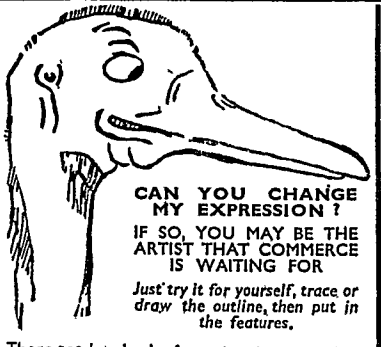

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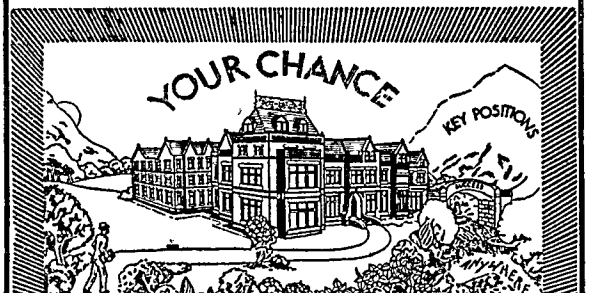


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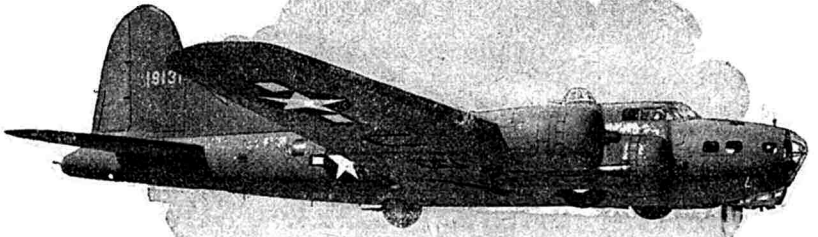

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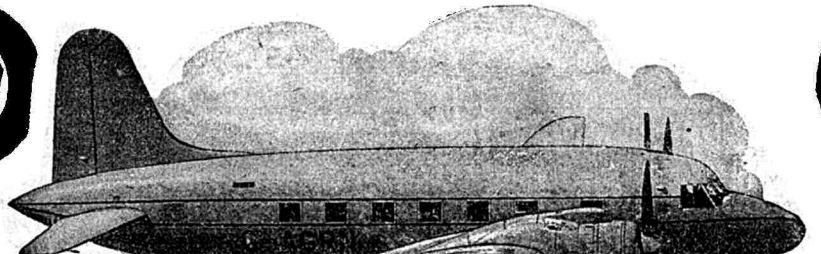

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The AEROMODELLER
INCORPORATING "THE MODEL AEROPLANE CONSTRUCTOR"

ESTABLISHED 1935

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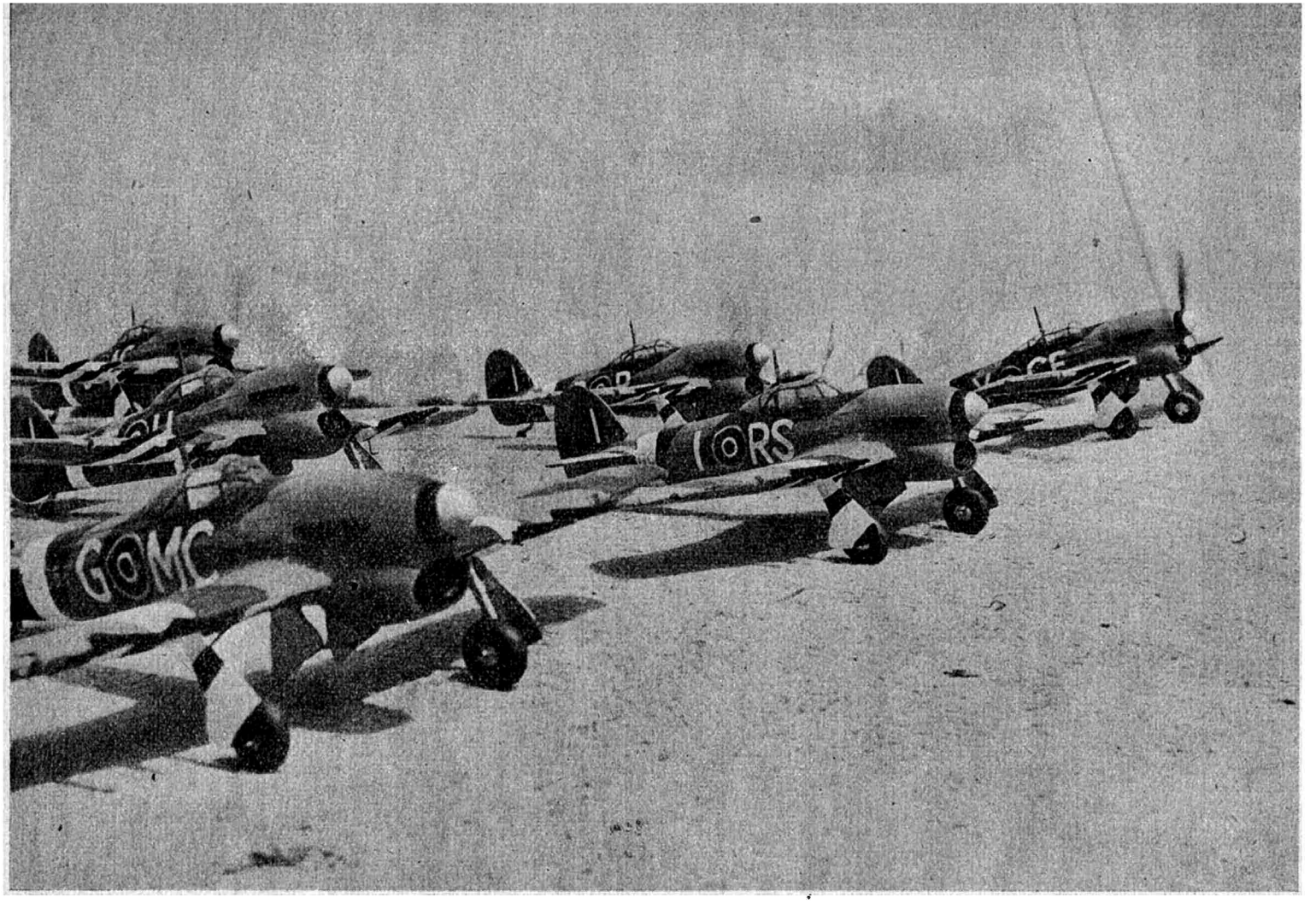
# Contents




" TIFFIES " ON PARADE.

A group of mass-produced flying scale Typhoons, built and superbly photographed by G. Massey Collier, whose methods are described elsewhere in this issue.

# EDITORIAL

## ORGANISED MODEL FLYING

NOW that readers have had time to digest and meditate upon the survey of model flying clubs that appeared in our December issue, we feel that further reference to the subject would be timely. Careful study of the survey brings out, in our view, two outstanding points. One of these points is the amazing increase in the number of clubs in the past three years, notwithstanding the pre-occupation of potential members with the demands of the Forces and Civil Defence, and more recently the business of post-war resettlement. This is a most happy contrast with the position in World War I, when everything in the aeromodelling line folded up completely, and the delays and pangs of re-birth had to be endured in the succeeding years.

Throughout World War II a surprisingly vigorous Movement was maintained, and it is most gratifying to find that in 1943, with the war still on, there were no fewer than 185 clubs functioning and that by October, 1946, this number had increased by 80 per cent. to 333. Credit for the maintenance of vigorous activity throughout the war years must, we feel, be shared largely by the S.M.A.E. and ourselves. Early in the war the S.M.A.E. adopted a "Continuity" policy that aimed at maintaining at the least a skeleton organisation in being should conditions prove so disturbed as to prevent ordinary activities. To be quite frank, we do not feel that this policy was maintained as wholeheartedly as it might have been, particularly in the matter of petrol models, but it certainly did count for a great deal. We of the AEROMODELLER can also claim credit for having given a vigorous lead to regions which the S.M.A.E. does not touch, and maintained publication on what has been accepted on all hands as a really high level despite innumerable wartime difficulties. All this serves to emphasise the ever-increasing popularity of aeromodelling.

The second outstanding item in the club survey is the disquieting fact that despite the increase in the number of clubs, 47 per cent. of them remain content, apparently to paddle their own canoe instead of linking up with a national organisation, and that out of the estimated figure of 500,000 aeromodellers in the country (omitting large groups such as the A.T.C., which are not concerned entirely with modelling), only 9,313 belong to a club. Aeromodelling, we know, is a very individualistic hobby, and it is admittedly none too easy to get people to band together and work as teams. It requires, in fact, the utmost breadth of vision and friendly understanding of other people's tastes and viewpoints, to win their support in substantial numbers, and it is in this connection that the S.M.A.E. in our view still falls short in carrying out its claim to "govern" the movement under mandate from the Royal Aero Club. The S.M.A.E. has tended to attract to its extensive ranks people who see things primarily, if not entirely, from the national and international competition point of view (pot-hunting to use the vernacular), and who legislate accordingly, leaving many people with different views scorned or at least unprovided for.

It was largely this mental limitation that led to the formation of what some people persistently regarded as a rival national organisation rather than as a complementary group. We refer, of course, to the A.B.A. We of the AEROMODELLER felt that this new group's viewpoint merited a hearing, and Mr. Russell felt that some financial support was called for, not necessarily because we saw eye to eye with it on every point, but because as a responsible and unbiassed national magazine we regarded it as a duty to defend the group's right to be heard and to act in accordance with its views.

This attitude on the part of Mr. Russell and the AEROMODELLER has been the subject of considerable misunderstanding and mis-representation. The support given to A.B.A. as a matter of fact, was no more than had been accorded to S.M.A.E. in its less spacious days, and it was because and only because of the unscrupulous attacks made by certain people on the A.B.A. at its commencement that we took up the cudgels so vigorously on its behalf. There were no lacking those who regarded the formation of a second national organisation as unwarranted, unwise, and even ethically indefensible, but that the move was justified is, we suggest, clearly shown by the A.B.A.'s remarkable progress. Within two years of its formation, it had attracted half as many clubs as had been drawn into the S.M.A.E. orbit in many years, and it had reached a point where it could dispense with any form of sponsoring, and, relying solely on subscriptions, stand on level terms with the S.M.A.E. despite the profits which the latter is able to draw from sales of its magazine since the link-up with a well-known publishing house, and from participation in that firm's popular annual modelling exhibition. The position with regard to A.B.A. so far as we are concerned, is now that Mr. Russell has resigned from the treasureship and from the Council, and the whole organisation is in the capable hands of Mr. B. A. Germany as Chairman with Mrs. Keywood as the efficient secretary and with convenient headquarters at Leicester.

The point we wish to make in putting forward the above observations is that little justification as there was for the suggestion freely made some time ago that we of the AEROMODELLER were pro-A.B.A. and anti-S.M.A.E., there is still less justification to-day. As far as we are concerned the S.M.A.E. and the A.B.A. are two great national organisations of aeromodellers whose merits and dignities we are not disposed to argue about. The facts that matter are that the two groups exist and that they are functioning and doubtless will continue to do so. What we are concerned about is how they function. We feel that the A.B.A. with its broader basis and desire to cater for a wider range of interests, has given a lead in the matter of attracting the hitherto unattracted modeller, as the figures to which we have referred testify.

This matters a great deal. We want many more of the 500,000 modellers in the country to link up with others, and many more clubs to link up with one national organisation or the other, for their own good and the well-being of the movement. That way lies progress, power to hold our own in any dispute with individuals, local authorities or other groups who through lack of airmindedness might prove obstructive, a quicker appreciation of modern technical developments and a keener enjoyment of our incomparable hobby.

But—and this is the crux of the whole matter—the

co-operation of those unattached modelling enthusiasts will not be won or held by organisations on any narrow sectional interest basis, and still less by a heavy insistance on status and dignity and mandates, and so forth. What is needed is a broad conception of what aeromodelling is and can become, and an enlightened policy based upon it. Let all would-be organisers and legislators think it over—and go to it.

## Art Insets

That the special section of the Christmas AEROMODELLER printed in full colour on white art paper met with widespread appreciation is indicated by the number of readers who took the trouble to write to us on the subject. Some of the writers, in fact, carried their expression of approval to the point of suggesting that every issue of the AEROMODELLER should contain such an inset.

We ourselves would go further and say that it would give us the greatest pleasure to print the whole of each issue, or at any rate the text pages, on white art, and as a matter of fact, we propose to do so as soon as it is practicable. Why it cannot be done at the present time can be explained quite simply. It is not a question of art paper being dearer than the paper we are using, although in fact it is, but that it is heavier, and that the supply of paper to periodicals which is still rationed is on a weight basis. It follows, therefore, that the larger the number of would-be readers the more necessary is it to use the thinnest paper possible to make supplies of the magazine go round—and this is a very large circulation indeed.

Many readers will be aware that there has recently been quite a useful increase in the paper ration, but it was a question of deciding how best to use this. After careful consideration the major portion of the increase was devoted to increasing the number of pages, and a small quantity was used for the art inset in the Christmas number which enabled us to print that section in full colour. This colour work is greatly superior to the grained tints that are the most we can achieve on the ordinary paper, and we felt that a taste so to speak, would be appropriate for the special double number.

We would like to assure readers that as soon as paper supplies are sufficiently increased, we certainly propose to use white art paper for every issue.

## What's in a Name?

A rose by any other name may smell as sweet as the Bard of Avon declared, but that names count for something too was brought home somewhat forcily to the Harborough Publishing Company by a recent experience. Some time ago a manuscript for a book was submitted by Jack Parham, who is not only an enthusiast for the outdoor life, but a keen amateur flier and an experienced aeromodeller. It was on the subject of how flight is secured, and dealt with this theme very clearly and entertainingly and in the uncommon manner of a comparison between birds and their human imitators. It was illustrated with some outstandingly good bird photographs and some crisp line drawings bringing out the author's points. We decided to publish, and—here is where trouble slipped in—in a mad moment we decided to title the book " Bird Flight for Bird Lovers."

The result was that the publication was enthusiastically received by bird fanciers and cold-shouldered by aeromodellers! We were glad enough for the bird fanciers to have some copies of this book but infinitely preferred them to go to the aeromodellers, for whom they were primarily intended! To this end, we have now re-bound the book with a new title, " The Beginner's Guide to Flying," much more appropriately related to the contents. The dust jacket has been reversed, its decorative bird design going inside and a new design featuring the Auster Autocrat aircraft on view in its place.

The book is in a light and very readable style and succeeds in getting the information over without mention of angles, decimals and graphs. Aeromodellers would enjoy reading of the expert aeronautical efforts of Stephen The Seagull, Kennie the Kestral, James Rook, how they go about their business and how similar situations are—or should be—dealt with by human imitations like Jessica Brown. The book sells at five shillings, and with its completely fresh approach to the problem of flight, is well worthy of a place on every aeromodeller's bookshelf.

## "Gen" Wanted

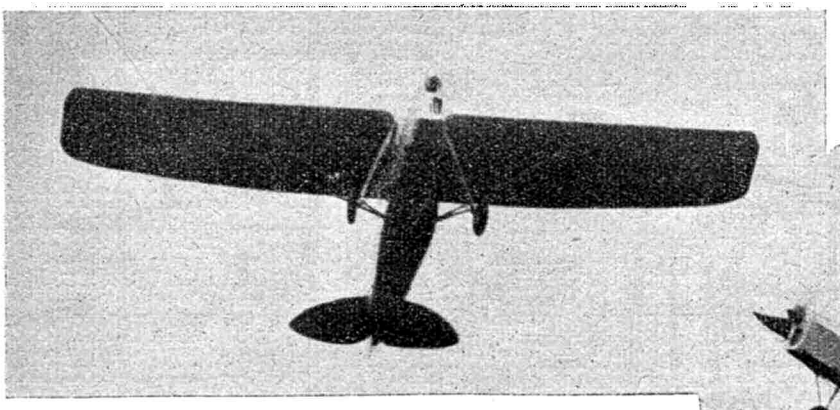
There can be few literary undertakings more exacting and of greater magnitude than the compilation of a comprehensive and accurate historical survey, and however well it is tackled almost inevitably there will be errors or omissions.

These observations are prompted by a letter we have received from Lt.-Col. C. E. Bowden, whose " History of Model Aircraft," published by Harborough some months ago, is delighting a host of old and new exponents of our hobby. No true artist is ever satisfied with his product and Col. Bowden is already looking ahead and thinking in terms of a new and better version. Meanwhile, he asks readers of the book who are in possession of historical facts not included in the book to forward them to him c/o the AEROMODELLER.

It may well be of course, that some of the facts sent in will not be suitable for use, or the volume of response may be so great as to make it impossible to use more than a small percentage. We trust readers will appreciate this, also that the senders must, perforce, rest content with no more tangible recognition than the satisfaction of having had a share in the improvement of an already excellent book on the history of aeromodelling. Col. Bowden's book, by the way, sells at 8/6 and with its wealth of technical and factual information is excellent value.

## Dorland Hall

As we go to press, the Third National Model Aircraft Exhibition at Dorland Hall is drawing to a close, and we can begin to draw some worthwhile conclusions. The outstanding feature has been the phenomenal attendance, which has exceeded considerably even that of last year. Various changes in the set up were made this time, and as in former years a careful study will be made of every aspect of the Exhibition to guide us in the future. Some of the points emerging are well worthy of comment and we propose to devote space to them in the March Editorial.



# A 30-inch SPAN DE HAVILLAND 80A

# PUSS MOTH

DESIGNED AND BUILT BY J · M · GREENLAND

THIS model is of the Puss Moth used by the Royal Air Force Flying Club at Hatfield before the war, and the full-size machine is depicted on our front cover this month by C. Rupert Moore. It carries the club's crest and rudder stripes and is built to the scale of 5/6 to one foot giving a wing span of 30 inches and flies with a scale tailplane.

**Fuselage.**

Build in the usual way with ⅛ in. square longerons and spacers. The top and bottom stringers are raised on blocks of balsa to the various depths shown on the plan. The window frames are of "T" section 1/32 in. sheet balsa, the celluloid being fitted on the inside, a separate piece being used for each panel. The undercarriage is mounted in brass tubing cemented firmly into the fuselage, the front legs are tensioned by two elastic bands tied round the bottom longerons.

**Wings.**

These are of straightforward construction. Pin the main spars to the plan and slot on the 1/16 in. sheet ribs, then add the leading and trailing edges and birch tips. The solid balsa fairing at the wing root is tapered to a point where it touches the cabin roof. Half of a press stud is soldered to a strip of tin which is pushed through the fairing and first rib, and then bent back and soldered. The struts must be carefully adjusted to give the correct amount of dihedral and sweepback as shown on the plan.

**Tail Unit.**

A symmetrical section is used, all ribs are cut from 1/16 in. sheet balsa. The ribs are fixed to the main spar and then the outline is added. The fin is cemented to the centre line of the tailplane and the whole unit is held to the fuselage by a rubber band.

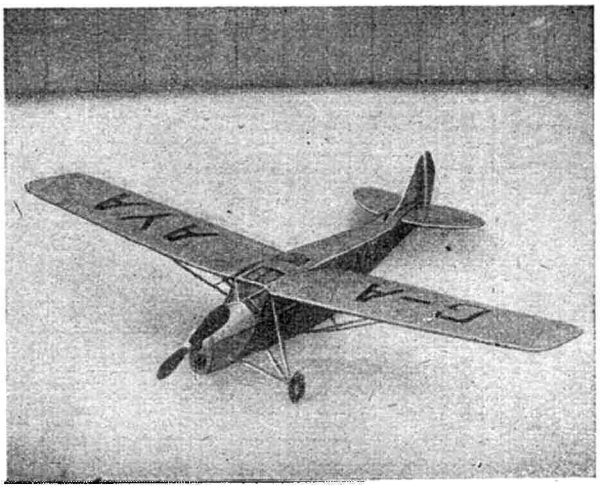
Cover the whole model with jap tissue and spray aluminium all over. The lettering is in black and the R.A.F. Flying Club crest is deep red with pale blue and dark blue.

**Flying.**

¼ oz. lead was put in the tail of the original model to get the c.g. in the correct place. The glide is very flat and fast and the model flies in a nose-down attitude, like the real machine. The average duration on 300 turns is 20 seconds.

Full-size detailed drawings (see ⅓ scale reproduction overleaf) are available from Allen House, Newarke Street, Leicester, price 1/6 post free.

*Following our usual practice we present the model alongside its "big brother" and it compares well as readers can see. Note the airscrew on the model which is scale size.*



A 30" WING SPAN, RUBBER DRIVEN FLYING SCALE MODEL

# D.H. 80A. PUSS MOTH.

DESIGNED BY

J.M. GREENLAND.

1/6



ALL WOODS UNLESS OTHERWISE STATED ARE BALSA

1/16" SHEET CEMENTED ROUND NOSE TO THIS LINE FOR ENGINE COWLING

PRESS STUD SEWN TO LONGERON & 1/16 SHEET INSERT

1/16" SHEET

3/16"OD 1/8"ID PAPER TUBE FOR WING DOWEL NOTE SLOT FOR WING RETAINING HOOK

FRONT WINDOW FRAMES 1/32" SHEET 'T' SECTION

1/16" SQ

1/16" SHEET

1/16" SQ

PROP BLANK 9/16" X 13/16" X 6" HARDWOOD POWER 2 LOOPS OF 1/4" X 1/32" PER MOTOR

1/16" SHEET SHAPED TO FIT CONTOUR OF TAILPLANE

FIN MADE UP OF 1/16" SHEET

RIBS 1/16" X 5/32" SAND TO STREAMLINE SHAPE.

1/8" X 1/16" TAPER TO 1/16" SQ.

1/16" SQ

1/32" SHEET.

1/8" SQ.

1/8" SHEET.

FUSE WIRE.

18 SWG TAILSKID.

1/8" SQ

1/16" SQ

PAPER TUBE FOR WING STRUTS

TURNED ALUM" SPINNER TO SCREW ONTO PROP SHAFT

HOLES TO TAKE DRIVING PINS

16 SWG SCREWED PROP SHAFT

TIN DISC 16 SWG DRIVING PINS SOLDERED ON

BALL RACE

SCREWED BRASS BUSH

16 SWG MOTOR HOOKS WITH CUP WASHERS SOLDERED TO ENDS

RUBBER BAND ROUND LONGERON TO TAKE U/C LEG & ACTING AS SHOCK ABSORBER

BRASS TUBING THROUGH FUSELAGE TO TAKE U/C LEGS

1 1/4" DIA HARDWOOD WHEELS.

1/16" DIA BAMBOO TO ACT AS EXHAUST ON S'BOARD SIDE ONLY SECURED TO FUSELAGE BY PAPER TUBES CEMENTED TO SIDE LONGERON EXHAUST PASSES BETWEEN FRONT U/C LEGS & INTO ENGINE COWLING

1/8" DIA HOLES TO TAKE HARDWOOD DOWELS HOLES REINFORCED WITH CELLULOID

1/16" SHEET OUTLINE.

1/32" SHEET TOP & BOTTOM.

1/4" X 1/16" SPAR TAPERING TO 1/16" SQ

RIBS 1/4" X 1/16" SHEET SAND TO STREAMLINE SHAPE.

1/16" SHEET SEE SIDE VEIW.

CABIN HEATER S'BOARD SIDE ONLY

1/8" SQ. TOP ONLY

1/32" SHEET TOP ONLY

3/16" PLYWOOD NOSE PLUG CONTAINING 2 BRASS GEAR WHEELS EACH OF 11/16" DIA & 1 BRASS GEAR WHEEL OF 1/8" DIA NOSE PLUG SECURED TO NOSE BLOCK WITH 4 BRASS SCREWS

NOTE

ALL LONGERONS & CROSS STRUTS 1/8" SQ ALL DIAGONALS 1/16" X 1/8"

CELLULOID CABIN WINDOWS.

FORMER 'C' 1/16" SHEET.

FORMER 'D' 1/16 SHEET PASTE ON INSTRUMENT PANEL TRANSFER.

USE THIS PIECE WHEN CUT OUT OF FORMER 'A' AS TEMPLATE FOR NOSE PLUG.

FORMERS 'A & B' 1 OFF 1/32 PLY 1 OFF 1/8 BALSA.

FRONT VIEW OF NOSE BLOCK (WHITE PINE)

1/16" SQ TOP & BOTTOM STRINGERS SUPPORTED ON BLOCKS AS SHEWN IN SIDE & SECTION VIEWS

18 SWG U/C LEGS ACTUAL LENGTH & SHAPE OF LEGS SHEWN

SPRUCE FAIRING

PAPER FAIRING

SECTION A A

SECTION B B

A PIECE OF TIN IS PUSHED INTO FAIRING & BENT AS SHEWN IN SECTION 'B B' HALF OF PRESS STUD IS THEN SOLDERED TO TIN.

HOOK PUSHED INTO FAIRING & BOUND TO DOWEL DOWEL IS CEMENTED INTO RIBS & REINFORCED WITH 1/16" SHEET GUSSETS

1/8" SQ. L.E.

1/8" X 1/4" F.S.

PAPER TUBES TO TAKE WING STRUTS.

1/8" SQ

1/16" X 3/16" REAR SPAR

3/16" X 1/16" T.E.

1/16 SQ BIRCH

1/2 DIHEDRAL AT THIS RIB

1/16" SQ BRACE SUNK INTO BOTTOM OF RIBS

1/8" S'BACK

HOLE FOR AUXILIARY STRUT

REINFORCE WITH TISSUE

FRONT

5/32" X 3/32" SPRUCE WING STRUTS SAND TO STREAMLINE SHAPE

1/8" X 1/16" SPRUCE AUXILIARY WING STRUT SAND TO STREAMLINE SHAPE.

PAPER TUBE TO TAKE AUXILIARY WING STRUT.

REAR

20 SWG HOOKS BOUND & CEMENTED TO STRUTS

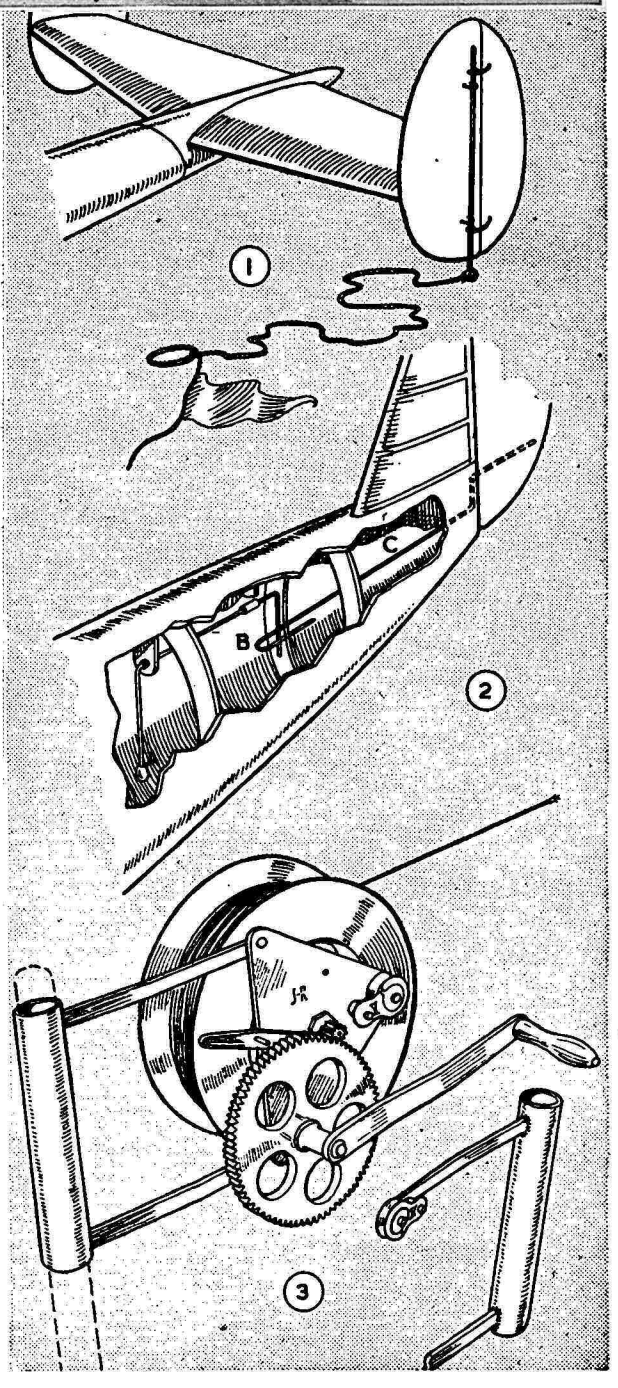
F.S.R.256


INKY pinky parlez vous to all of you, and in case you don't speak French, all that is an introduction to a new development in the glorious history of Gadget Review. Consus, like many of his countrymen, was busily engaged during part of last August in running around and carrying on peculiar conversations with puzzled foreigners at Eaton Bray. Despite his original line in *bon mots* and *faux pas* which made Esperanto sound like baby talk, he did manage to obtain a perfectly good diesel, and also pukka gen on some rather interesting items in the way of gadgets. Ergo, he takes this opportunity of dumping same upon his unsuspecting readers. In the way of really practical gadgets, our friends from across the water would seem to be quite as well equipped as ourselves.

First of all is one which frankly does not look very trustworthy, and if it had not been seen in operation on several occasions would still have been regarded with deep suspicion. It was fitted to a machine which aroused much interest and favourable comment, the sleek streamlined airfoil section fuselage sailplane of M. TANTET of France. The idea is very simple—a wire pin is fitted to an extension of the towline, and plugs into two wire eyes on the port fin and two control horns on the port rudder, which is spring loaded to starboard. It is used as an auto-rudder control—when the ring comes off the forward hook the wire pin drops out of the eyes and releases the rudder which then takes up its spring-loaded position and the model circles to the right.

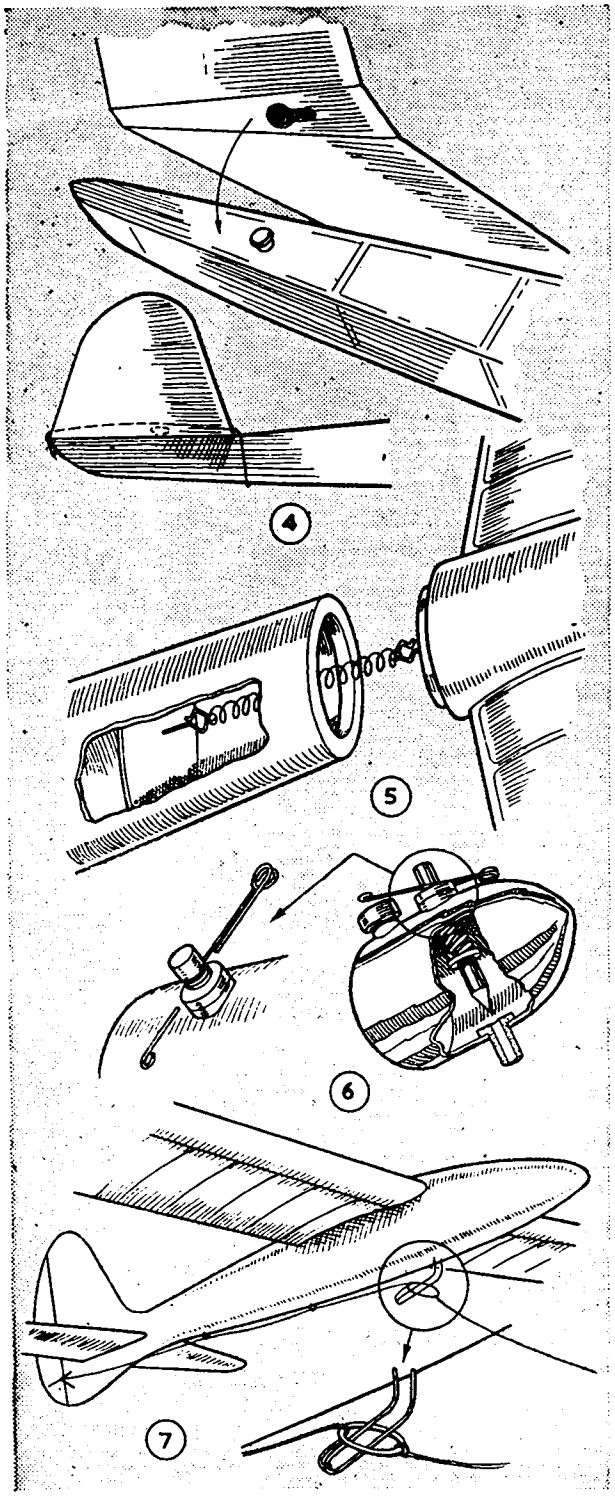
The reports of many authorities have led us to believe that there was no future in pendulum control. It is very interesting to find, therefore, that it was used quite successfully by M. JOOSTENS of Belgium, who had the scheme drawn in Fig. 2, fitted to one of his competition models. The tiny weight swings to left or right according to the attitude of the model, and the rudder corrects the movement accordingly. All the shafts and guides were made from thin piano wire, and apparently the secret of the whole business is the disposition of the weight.

Standardisation of orthodox mechanisms has many advantages to commend it, for apart from reduction in cost it means that no contestant need have any advantage in this way over his fellow competitors. Most of the French contestants were equipped with a standard winch (Fig. 3), which can be obtained for under a pound in their own country. It was a clever little apparatus with only one apparent drawback, the lack of a guiding stay which sometimes resulted in the line winding round the hub of the drum when winding in. Made almost entirely of fairly heavy dural, it was light in weight but strong enough to take the casual bashing of a communal machine without ill effect. A pawl prevented accidental mishandling of the line, a tweak being all that was necessary to release the model. A neat catch of the sewing machine type held the end of the line when wound



in and prevented it wandering and tangling. The handle was simply a piece of dural tube which could be mounted on a stake if so desired. The ratio of the gears was approximately eight to one, a much more handy figure than is usually found with winches in this country.

The smallest country in Europe is no whit behind the others except in size, and amongst many interesting devices originating from Monaco was this of M. AUBERTIN'S. The little stud is firmly fixed to the fuselage where the tailplane rests, and a keyhole shaped slot is cut in the planked undersurface of the tailplane to fit over the stud. The tailplane is placed in position and then pushed gently backwards, thus locking it. A rubber band is then placed over it to prevent any swing to left or right. When the model strikes anything with considerable force, the tailplane slides forward, disengages, and comes off. Consus permits himself a slight criticism, for it seems to him that the chances of the tailplane receiving a hard knock before it has a chance to slide forward are very considerable, and rather than undergo the resulting wrench-off, he would put the slot the other way round. Still, perhaps it's only his models!




The good old weak link principle crops up again to good purpose and in a newer form in a model we have already mentioned, the cream sailplane of M. TANTET of France. A nasty landing holds no fears for this modeller, even a tailslide should it occur doing nothing more than dislodging the tail unit. This plugs into the rear fuselage in the manner shown, being retained by the simple spring-loading device against movement until the tailplane comes into contact with some obstacle. The spring is wound from light gauge piano wire, and is held into the rear fuselage by an 18 s.w.g. hook fixing into a strong ply solid bulkhead. It would be quite possible to use rubber bands as the retainer if these are preferred to the spring. This system also solves a problem of transport in a useful manner, for the tailplane is now easily detachable with no extra bulk.

The question "Who makes the most famous diesel engines?" might not deserve the easy reply that at once jumps to the lips. Micron, of course, is the firm, but the man behind the design is our very good friend CLAUDE BONNIER, and it is to him that the credit must go for the simple, practical, but ingenious cut-out fitted to the Micron and illustrated in Fig. 6. It works in the only really positive way, by cutting off the fuel. Monkeying with the air supply is often very successful, but is always accompanied by an element of uncertainty. In this case, the fuel supply is entirely cut off by a spring-loaded plunger needle which fits into the fuel outlet from the tank, situated at the bottom as the engine is gravity fed. The top of the plunger projects from the top of the tank, through a metal collar. To this metal collar is fixed on the side nearest the engine one arm of a thin steel wire "safety-pin" spring, the other arm of which, terminating in an eye, rests in a shallow groove cut in one side of the plunger. The tension of the spring holds the arm in place when the plunger is pulled up, and the plunger is retained there until the time when a servo device such as a clockwork or airdraulic timer exerts tension on the arm by means of a piece of cotton or similar attachment to the eye. This pulls the arm out of the groove and allows the plunger to move under the tension of its spring and effectively seal off the fuel.

Only room for one more gadget, and this is a variation on the auto-rudder control scheme already described. This was fitted to an elegant sailplane designed by Dr. MILLET of France, and really makes more appeal to Consus than the previous idea. Working once again on the principle of a wire pin being pulled out when the towline releases, the pin is this time nearer to being in line with the towline, and a reluctant pin is less likely to have such disastrous results. The pin, of course, fits into two wire eyes, one on the fin and the other on the rudder, which is spring-loaded.

# CONIC LOFTING

BY S · J · SMITH STUD. R. Ae. S.

## A MATHEMATICAL METHOD OF REDUCING PARASITE DRAG

THE average aeromodeller will appreciate the advantages to be gained by the mathematical layout of model outlines, frames, etc. For large models the technique of " fairing in lines by eye " is totally inadequate.

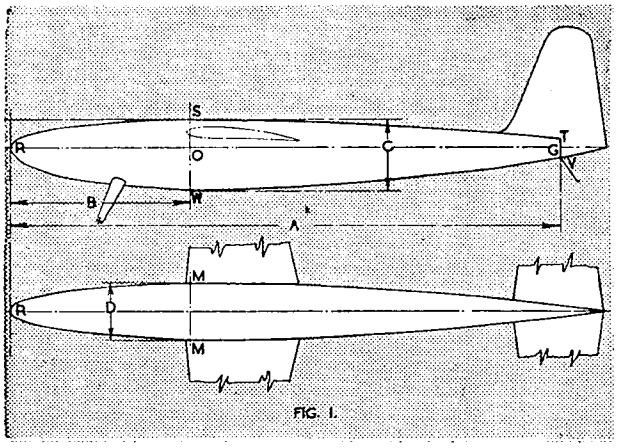


FIG. 1.

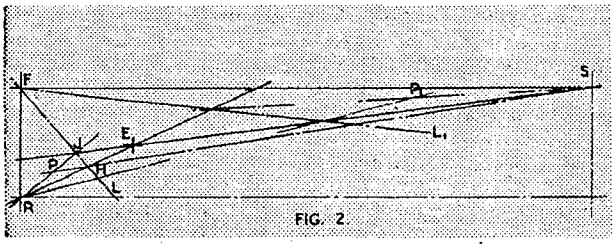


FIG. 2.

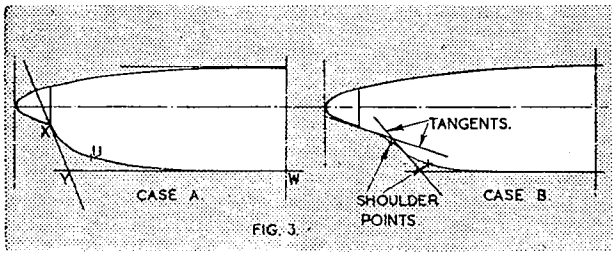


FIG. 3.

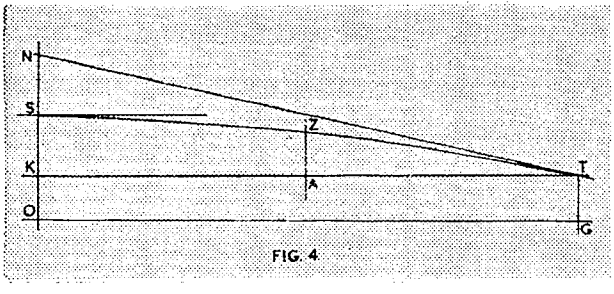


FIG. 4.

An example of the application of conic lofting to fuselage layout is outlined below.

Fig. 1 illustrates the side elevation and plan view of streamlined fuselage. The first step in the accurate production of such a drawing is the plotting of the length, maximum width, and depth, *e.g.* dimensions A, B, C and D. If a sternpost is required it too should be laid out at this stage (as, for example, points T and V).

Curves RS, RW, RM, etc., can now be attempted. The method of constructing such a curve RS, for example, is shown in Fig. 2. The tangents to the points R and S are drawn to intersect at F. Any point E is selected through which the curve is required to pass. This point is called a shoulder point. Lines SE and RE are drawn and produced. Now any line FL through F is drawn. This line is called a Pascal line. The intersections of this line with RE, SE are marked. (Points H and J respectively.)

RJ and SH are drawn and produced. Their intersection gives point P, a point on the required curve. More points on the curve can be obtained by using more Pascal lines, *e.g.* FL giving point P, etc.

When sufficient points have been obtained the curve can be readily drawn in.

For those aeromodellers who prefer an airscrew spinner to a nose block, Fig. 3 illustrates alternative methods of obtaining the lower nose lines.

In case (*a*) a symmetrical spinner is drawn. From the point X a suitable tangent XY is added. When the shoulder point is chosen the curve XUW is obtained with the standard construction detailed above.

In case (*b*) a double curve is shown necessitating two extra slopes or tangents and two extra shoulder points.

It may be noticed that (*a*) bears a resemblance to the nacelle line of the Spitfire, while (*b*) is similar to that of the Mustang. For the rear fuselage an excellent curve is obtained by using part of a parabola.

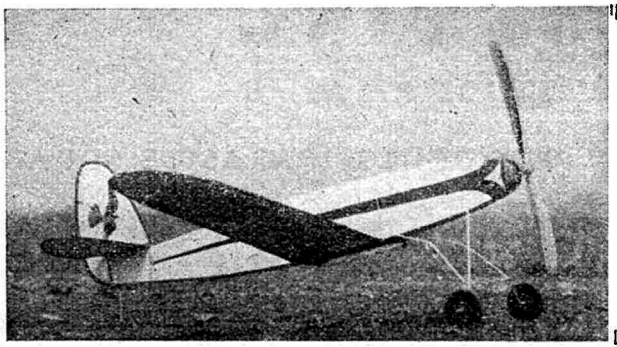
The method for the construction of the curve ST is as follows (see Fig. 4). For reasons of clarity SO and TG have been increased in length.

Draw TK parallel to the datum OG. Mark off SN equal to SK. Then TN is a tangent to the required curve at T. Bisect KT, erect a perpendicular and mark off AZ equal to $\frac{3}{4}$ of SK. Then Z is the shoulder point and the curve SZT can be obtained as before.

It will be appreciated that providing 3 points and slopes on two of the points are given, the curve can be drawn irrespective of the angle between the tangents.

Although only the aspect of fuselage layout has been examined, the foregoing methods are equally suited to the layout of wings, tail-units, formers, etc.

It is interesting to note that the North American Aviation Incorporated claimed that their Mustang fighter had the lowest drag coefficient of all operational aircraft, in view of the fact that all the curves on this machine were of the "second degree" type (which is the name of the curves described above).



# MAINLY FOR BEGINNERS

BY M · R · KNIGHT

*The writer's "AVIS" beginner's low-wing showing the typical exaggerations mentioned in this month's article.*

MIXING with the enthusiastic crowd that thronged Dorland Hall on the opening day of the Third National Model Aircraft Exhibition, I overheard a remark that will serve as a starting point for what I have to say this month. The speaker had his youngster with him and they had been looking at some rubber-driven models of freelance design. Drawing attention to a case of small replicas of full-size aeroplanes such as the Spitfire, Tempest, etc., father remarked, "these will interest you most: they're like the real ones."

It was a very significant remark, for it raises a fundamental issue that confronts every newcomer to our hobby, and on his reactions to which largely depends his aeromodelling future. Despite the fact that a *model* aeroplane succeeded in flying before a *full-size* man-carrying aeroplane did so, it is the latter that people generally are more familiar with, and that they therefore take as a criterion of what a model aeroplane should look like. Thus, when they first feel the urge to build and fly a model, they are often struck most unfavourably by the fact that most designs look strangely unlike any full-size type that they have encountered. True, these models that fly so well have the customary "ingredients," a wing, a tail, a body or fuselage, a propeller, and an undercarriage, yet somehow they look unpleasantly different. The difference, in fact, is that between a photograph and a cartoon. The model is a full-scale aeroplane in miniature, but with "exaggerations" like those in a cartoon. Beginning at the front end of a model the first exaggeration is the propeller, which looks uncommonly large for so small an aircraft, the next is the undercarriage, which looks very tall and stilt-like; and the third is the position of the wing, which seems a very long way back along the body, giving the model some resemblance to a wild duck. The model will almost certainly have another exaggeration about the wing. Looking at a full-size aeroplane from the front, you'll notice that the wings instead of being horizontal are bent upwards from centre to tips, forming what is known as the dihedral angle. With the full-size aeroplane this angle will be quite small, but with the model it will be much more pronounced.

Final exaggeration will be the uncommonly large size of the horizontal and vertical surfaces that form the tail. The total effect of this series of exaggerations is such that the newcomer to our hobby must often wonder what the heck the model designer was up to and frequently he turns to the so-called "flying scale models" which are seen more nowadays than they used to be, only to discover that apart from the extra structural complication of these types they are less simple to fly than the freelance designs and rarely fly anything like as well.

The reason for this disappointing state of affairs is not that the designer of what I will term the "cartoon" type of model was woefully unobservant of the real shape of full-size aeroplanes, but that he was aiming to produce a model with simple flying characteristics and good performance. Why should this necessitate the exaggerations referred to? Because there are certain vital differences between a model and a full-scale aeroplane that inevitably make themselves felt!

The first and most obvious difference, when you come to think of it is, in the case of a model, the absence of a pilot to manipulate the controls in the air and so counter the capsizing propensities of wind and air pockets. This forces the model designer to endow his machine with self-righting powers, and it is this necessity that accounts for the generous dihedral angle of the wings, and the large tail. How this works out will be explained later.

Second vital difference between the model and the full-size machine is in the use of a skein of rubber strip in place of a petrol motor. The weight of the rubber is distributed along almost the entire length of the fuselage instead of being concentrated in the nose as in the case of the petrol motor. This accounts for the greater distance of the model's wing from the nose, for the wing has to be mounted over the point of balance of the fuselage to enable the machine to fly. The rubber skein has to be twisted and allowed to unwind to drive the propeller, and unfortunately the number of "turns" that it will take without bursting is somewhat limited. To obtain a reasonable duration of flight we need to slow up the propeller while still deriving from it enough power to fly the machine, and it is to achieve this that the model's propeller is given a large diameter and wide blades. This, in its turn forces the model designer to use a tall undercarriage to prevent the propeller hitting the ground. Finally, the power of the rubber motor varies throughout the flight, and this, again, makes self-righting qualities in the model very necessary.

Over and above all this, when you go out to fly your nice new model, you'll probably soon gain a blinding glimpse of the obvious fact that the model designer cannot scale down the gusts of wind to a figure more in keeping with the size of the model. The upsetting possibilities, therefore, especially in our delightful English climate, are relatively greater in the case of a model than in that of the full-scale aeroplane, once again pointing to the need for self-righting qualities.

Thus it will be seen that the model designer's problem is not a particularly easy one, and he only complicates it and sacrifices flying performance if he insists on scaling down a full-size design instead of choosing shapes and proportions that lend themselves better to the job of securing flight without a pilot and with a skein of rubber for a motor. It will also be apparent that a newcomer will obtain quicker and better and therefore more encouraging results if he tackles a simple freelance type of model at first, and leaves scale modelling, if his tastes

lie that way, until he knows what he is about, and has sufficient building and flying experience to afford a reasonable opportunity of obtaining good results.

Incidentally, the writer has for years specialised in a " compromise " type of model in which, while no full-size design is copied, the model looks more like the " real thing " than the out and out high performance model and yet has a worthwhile flying performance. Such a class of model is somewhat handicapped in competitions for the obvious reasons that it cannot be entered in scale-model competitions, and can hardly be expected to beat specialised duration models, but it makes a very satisfactory job for pure pleasure flying.

One hopes that the perusal of the foregoing will have strengthened the beginner's decision to tackle a really suitable model for his first attempts at building. Meanwhile, while it is a-building he would be well advised to assimilate a little basic theory of flying. A little, incidentally, is exactly what I mean, for I feel that many text-books swamp the novice with theory and succeed only in confusing him. I want to try and avoid that, and I propose therefore, not to hand out theory in the quantity needed to enable the reader to design a model (that can come later), but merely sufficient to enable him to fly a model consistently well instead of cracking it up.

By way of approach let us take a closer look at a typical beginner's model. The very simplest form will consist of a fuselage with four flat sides, and a wing with its front and rear edges (leading edge and trailing edge to use the correct terms) parallel, resting on top of the fuselage, and a tail unit comprising an oblong horizontal tailplane and resting on its centre a vertical fin (or rudder, as it may be described alternatively).

With the wing resting on the fuselage, the model is described as a high-wing monoplane, and this is probably the most popular arrangement in almost every class of freelance design. Alternatively, the wing could rest against the bottom of the fuselage, making the model a low-wing monoplane. This is an arrangement that I personally favour for most purposes, including beginner's designs, but more about that anon. My own Klemlet design is a low-wing.

What I certainly do not recommend for beginners because of the greater structural complication, are the other remaining wing placings—the mid-wing monoplane (with its wing divided into left and right halves each joining the fuselage about half-way up the sides), the low-mid, which has the wing slightly lower, the shoulder-wing (the bird-like arrangement much favoured for international contest models) and the " parasol " with its wing held above the fuselage by struts or a specially shaped pylon. Still less would I recommend beginners to tackle a biplane, and even less a triplane.

Coming back to our simple high-wing job (or low-wing, if you prefer) one finds the wing made all in one piece (instead of being divided into left and right halves) and coupled to the fuselage with rubber bands or strip in order to absorb more or less harmlessly the occasional bashing due to faulty adjustment, collision with obstructions or heavy landings with the wind behind, which cannot be avoided in the absence of a pilot.

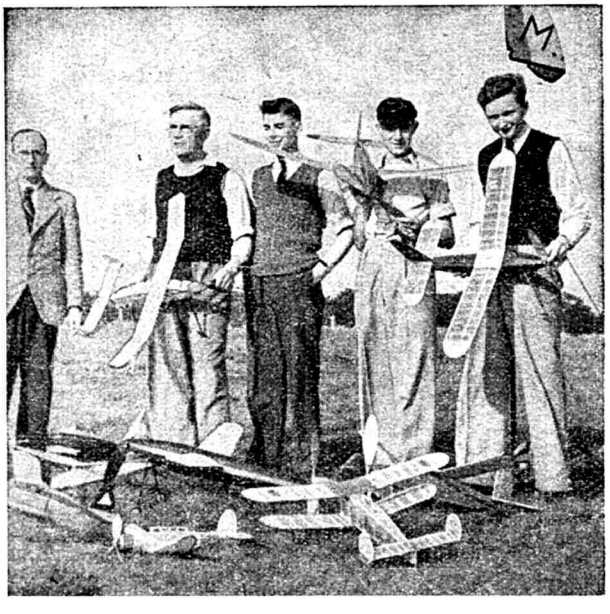
At the front end of the model will be a propeller almost invariably, in the case of a beginner's model, with two blades. Through its centre or " boss " is a wire shaft which also passes through a shaped wooden nose-block which is free to tumble out of its seating in the front of the fuselage when it receives a hard knock. The propeller shaft ends in a hook, and from this stretches the skein of rubber strip which turns the propeller and is anchored at its rear end to a removable wood or bone peg stretching across the interior of the fuselage.

Beneath the fuselage, somewhat to the rear of the nose-block will be the undercarriage, which is almost invariably removable from the fuselage to enable the model to be packed more easily for transporting to the flying. Under the rear end of the fuselage will be a wire or bamboo skid or a small tailwheel. On top of the rear part of the fuselage and coupled to it flexibly, as in the case of the wing, will be a smaller edition of the wing, though probably without any dihedral, termed the tailplane. Though in some cases it can contribute to the total of lifting force that sustain the machine, it is really a stabilising agent. Above it is another stabilising agent, the vertical fin.

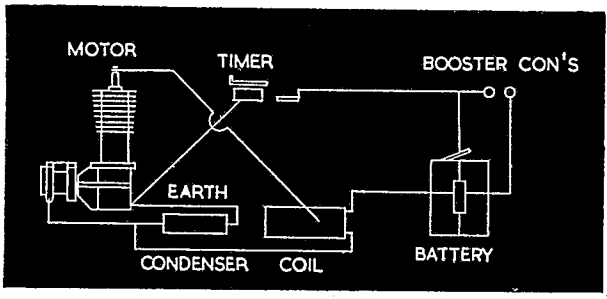
In full-size aeroplanes, the vertical stabilising surface consists of a rigid forward portion described as the fin, and hinged to its rear edge a movable portion termed the rudder, this part helping to steer the machine. Model practice in view of the absence of a pilot to do any steering, is to make a fin and rudder a single unit, with a hinged panel let in, in the case of certain models, for the purpose of varying the adjustment before flight. This simple unit used on models is described by some as the fin, and by others as the rudder.

Before going on to make a closer examination of the various components of our simple conventional type of model, perhaps it would be as well, in view of my remarks about rubber " motors " and their limitations, to explain briefly why this form of propulsion is so popular. There are several reasons, as a matter of fact. The first is that for years there was no really satisfactory alternative and so rubber got away to a good start. There were no reliable miniature petrol motors, as there are to-day—one or two people had had a certain amount of success with a steam engine, and there was also the compressed air type of motor, which never really caught on, and never, as far as the writer can recall, succeeded in climbing a model to a decent height. Second reason for the popularity of rubber is its simplicity and convenience

(*Continued on page* 184)

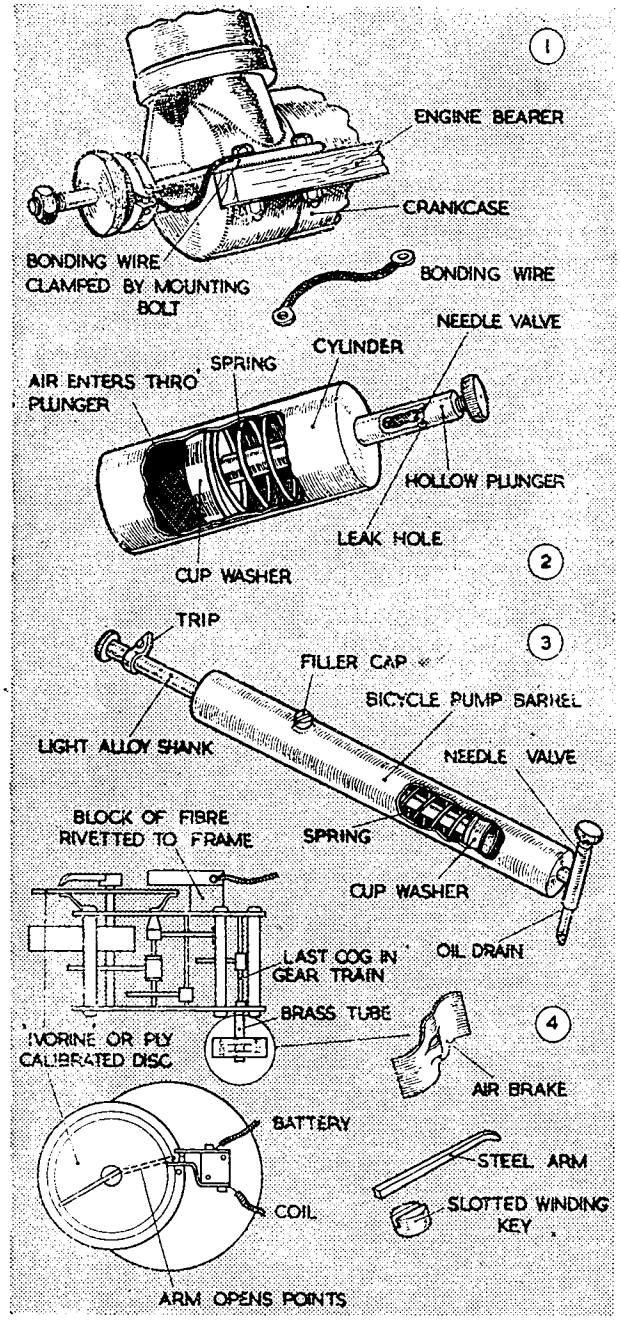


*Pupils from an L.C.C. Evening Institute on the flying-field. The writer is just in the picture on the extreme left. On the ground a " Wakefield " model, a scale Blackburn Skuda and a biplane.*




# BASIC POWER MODELLING Pt. II

BY G · W · W · HARRIS




WHEN the contact breaker has been reassembled hold the engine in such a position that the points can be clearly seen whilst the crankshaft is rotated. Turn the engine over slowly (with the sparking plug removed) and follow the action of the moving point. It should break away from the fixed point cleanly and evenly, not first one side, then the other as is sometimes the case. Note whether there is a tendency for the spring blade to twist as it is being lifted by the cam, for if it does it means that the blade is of too light a gauge or that the base of the slipper portion needs stoning to remove roughness or signs of wear. Again, the spring may be fatigued—if this is suspected replace a once. When the points are separated check whether there is any tendency for them to partially close again before their time. This may sound absurd, but I have more than once found this snag existing—obviously, if it does occur there must be some irregularity about the cam's surface; there may, for instance, be a locating grub screw sunk below the surface of the cam, or, again, some cams are pressed out of sheet steel, and as a result are sometimes distorted or burred. When fully separated, the points should be ·012 in. to ·015 in. apart. Many engine manufacturers specify a gap which they have found to be best suited to their own products, in which case it should be adhered to.

In case of doubt, ·012 in. is a safe figure. It is of course equally important to see that the points close squarely and smartly; there must be no hesitation. Not all the faults mentioned will apply to every type of contact breaker, but after reading this the novice will be better prepared to deal with adjustments and snags.

Before leaving this subject I am reminded, after glancing at one of my own engines, of another tip I may well pass on. Briefly it is this: Oil which creeps from the main bearing, besides finding its way to the contact points, often in a seemingly miraculous manner seeps between the crankcase body and the contact breaker sleeve, thus breaking down the necessary electrical contact between these two components. After experiencing this trouble I fitted a flexible bonding wire as shown in Fig. 1. This will ensure a positive connection at all times.

## Timers.

Of the various types of timers evolved during the last twelve years for petrol planes, two types have held their own to-day are supreme, one is spring-driven and the other works on the air-leak principle. Of the latter type there have been several variations put on the market at different times. Fig. 2 shows diagramatically the working principle. This type of timer is apt to be effected by temperature and wear. Further, to function at all well it must be made with great care and accuracy. It is not really worth spending the time required to make this

type of timer, for unless you are a first-class mechanic the results are likely to be disappointing. They can be obtained quite cheaply even to-day.

The first timer I ever used was back in 1934. I made it in the first place for operating a camera attached to a large kite and have since used it for dethermalisers (see Fig. 3). It could be made to function from 10 seconds up to 30 minutes. For best results I used 1 part engine oil to 3 parts paraffin.

For accuracy of operation undoubtedly the spring-driven timer is to be preferred. In those grand days before the war it was possible to buy small 2s. 11d. clocks and convert them into timers; there are several ways of making these conversions, and for the benefit of those who may want a timer badly here is one method :—

First of all scrounge a small clock motor and remove from it the escapement balance wheel and the little "jigger" that operates it. Next remove the last cog of the gear train and solder over the spindle a length of light gauge brass tube (see Fig. 4). Drill a clearance hole in the bearing plate for the brass tube and refit the cog, seeing that the brass tube runs true and freely. From a strip of very thin brass or tin cut out an airbreak, as shown in Fig. 5, and solder to the now extended spindle. Now modify the winding key as shown. It is possible to remove quite a lot of weight from the unit by cutting away portions of the brass frames. When you have lightened the motor, and it is running smoothly to your satisfaction, it can be installed on a mounting board as shown and then calibrated. To calibrate, first of all give the winding key two or three complete turns, marking off a zero and fitting the stop. Now give the key another complete turn, and with the aid of a stop watch and a pencil mark every 5 seconds wherever the pointer indicates. Several check runs should be made before marking more permanently. *Oil bearings sparingly with sewing machine oil before attempting calibrating timer.*

Now for the switch for the timer to operate. It is essential that the contact arm is as stiff as the power of the winding arm will allow, otherwise the contact may not be positive when the engine is running. It is desirable, if you can find them, to fit silver or platinum contact points, suitable points such as those fitted in good quality door bells can often be found amongst old electrical junk. Do not fit this timer where it can collect dust. A good scheme is to make up a dust cover simply by glueing a small paper bag over the unit before installing it.

**Sparking Plugs.**

The modern miniature sparking plug gives very little trouble; for this reason there is but little we can say about it.

The gap is set correctly by the makers, but should you drop a plug this may be upset: ·01 in. is the usual setting. A gap too large will cause mis-firing and make starting-up difficult.

To adjust the gap, bend the off-set electrode very gently with a small pair of pointed pliers: don't touch the central electrode.

Cleaning should be confined as much as possible to washing out with petrol.

Gentle sandblasting is permissible, once in a while; as a last recource only on the porcelain types. It does not follow that because a plug sparks correctly when removed from the engine it will do so when refitted. The pressure in the cylinder may cause the spark to jump anywhere but at the points. It is important to bear this possibility in mind when in trouble.

Those who anticipate a lot of petrol model flying and engine experiments would do well to consider making themselves a sparking plug pressure testing machine on the lines of the one shown in Fig. 5A. It is the only way you can be sure. This test is carried out on all full size aero engine spark plugs. After a plug has been cleaned and the gap adjusted it is subjected to a pressure test, the pressure being usually about 120 lbs. per sq in. Any plug failing to spark reliably at the points is rejected.

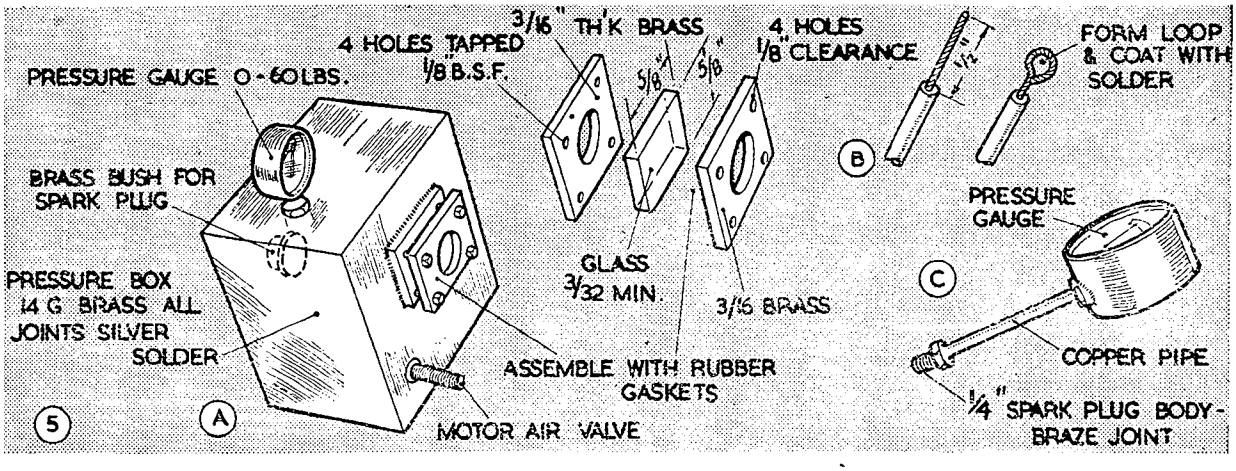
Another piece of workshop test apparatus for the enthusiast is shown in Fig. 5C. This simple instrument will readily show the cylinder pressure and the rate of the piston leakage.

To the engine designer and experimenter it can be a very useful instrument, but only experience can prove its real value.

**Installing the Ignition System.**

Now that we know something about the components of an electrical induction coil system we should be able to connect up these items with confidence and due appreciation for each component as it is installed on the aircraft. We will suppose the engine is already fitted on the model and it remains for us to fit the coil, condenser and timer and wire up (*see heading diagram*).

Start with the condenser. This we know should be fitted as near to the C.B. points as it will conveniently go. Clamp it down firmly—if it is not supplied with a fixing



clip make one from a strip of fibre, smearing cement under the clip.

It is important that the coil *should not be fitted within 2 ins.* of the engine unit—neither may it be strapped down with a metal clip. Failure to observe these rules may impair the efficiency of the coil to a considerable degree. Some coils are provided with fixing lugs for wood-screws (not nails), others have no provision whatever, and to make matters worse often have terminals placed in vulnerable positions. When fixing lugs are not provided and where it is convenient I advocate lashing the coil down on to a shaped wood block with thread or strong rubber bands, but do not use rubber bands unless they are accessible for renewal.

Fit the timer in a handy place such as just aft of the main plane trailing edge. You will no doubt have to consider the C.G. of the model when determining a home for this component, likewise the battery stowage position. I am inclined to give the timer priority of position, as it is usually possible to balance matters without inconvenience by moving the battery stowage, allowing a travel of several inches.

The booster connection points should be given careful consideration. Generally they are located with the timer or close to the engine. A lot depends on the size and type of your model, so your guess may be as good as mine.

### Wiring.

There are several rules to observe when wiring up ignition systems which, if carried out, will help considerably to ensure freedom from unnecessary trouble. It is a fact that the coil, condenser and sparking plug gives less trouble than the contact breaker and wiring. So check these points carefully :—

(A) For the high tension cable, *i.e.* coil to plug, use copper multi-strand heavy rubber-covered wire. Keep short and clear of metal, petrol and oil.

B. All other wiring should be insulated copper multi-strand wire such as the brightly-coloured electric bell wire now on the market. Do not use single strand wire.

C. Keep all wires as short as possible.

D. If the coil and condenser are fitted with tags only, solder the wires before installing.

E. If the coil is fitted with screw terminals do not hope that the nuts will remain tight, but apply a spot of thick shellac on the thread above each nut. It is not advisable to tighten these terminals with any tools.

F. Fig. 5B shows how to make up a sound and simple cable end.

Finally, study the practical circuit diagram until you feel certain you understand it. This will save you embarrassment on the flying field.

### Batteries.

So much has been written in the past on the subject of batteries, I have hesitated to make any reference to them here. However, on considering the matter I feel that this series will hardly be complete without a few general observations based on personal experience.

With all the aforementioned facts concerning the ignition system considered, it has been the writer's experience that at least most coils function well under flying conditions on 3-volt dry batteries (Ever Ready No. 800 or Drydex No. N.60). These batteries, by the way, are rather heavy (6 ozs.), but will give you at least twelve flights in succession with motor runs averaging 40 secs. The smaller cells (Ever Ready) of 1·5 volts each, will also give very satisfactory results in small models when connected in series, but need more frequent replacement for positive results.

(*To be continued.*)

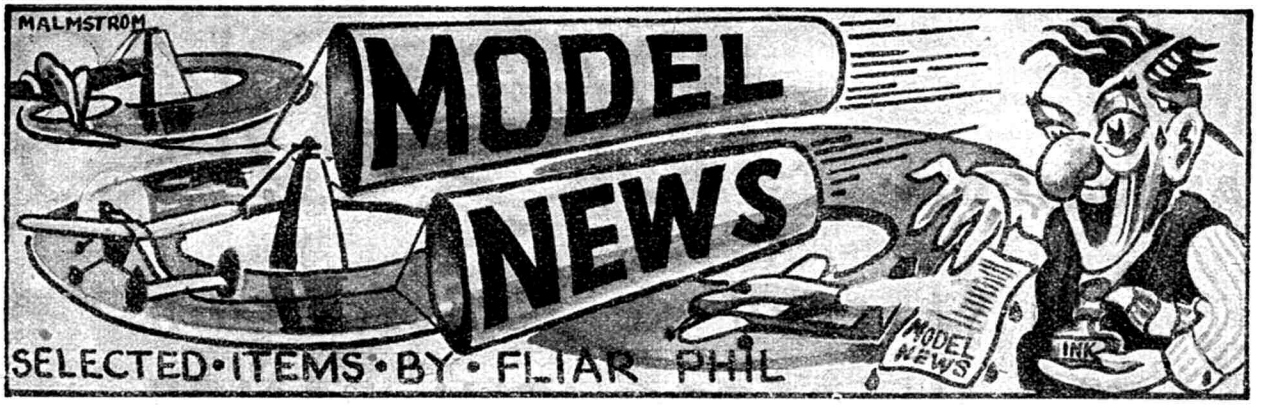
## Mainly for Beginners (*cont. from page* 181)

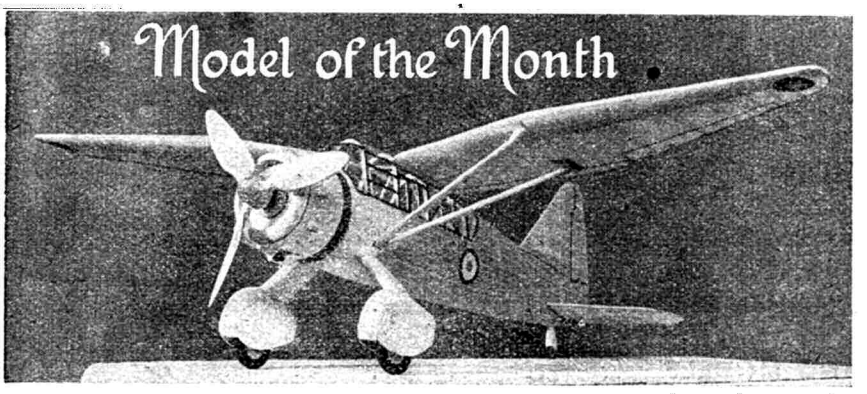
of use, enabling a new " motor " to be made up and fitted in a matter of minutes. Thirdly, the cost is extremely low, even to-day, and finally, rubber packs a bigger punch for its weight than any other form of propulsion other than perhaps the still very experimental jet motor. In short, the advantages of rubber far outweigh its disadvantages (of which more in due course !) and it can still give the modern miniature petrol motor a good run for the money.

Having thus digressed, let us now proceed to our examination of model components, beginning with the " wing," " wings," " mainplane " or " mainplanes," all of which terms are interchangeable. It is the mainplane from which an aeroplane takes its name, and let it be said straight away that the aeroplane is badly mis-named. The word " plane " signifies a flat surface, and no aeroplane wing answers to that description, though very fast flying wings may come near it. But a plane or flat surface does, in a sense, represent the starting point of flight by a heavier than air machine. Such flight probably began with men's discovery that a flat surface meeting the air at a small angle will generate lifting power. Turn a street corner on a windy day while carrying a large table top and you'll discover it for yourself ! Such a large flat surface, suitably inclined to the air and pushed through it, becomes, in effect, an aeroplane wing. Maybe some very early wings were flat like that. But it was very soon found that such a lifting surface suffers from a very serious defect—the " drag " or resistance to forward motion set up by it can easily equal or exceed the lifting power. The reason for this is very clearly set out in Mr. Rushbrooke's " A.B.C. of Model Aircraft Construction " in the chapter headed " Why it flies." Briefly it is that the air meeting the leading edge divides, part going beneath the flat surface and part passing over the leading edge and immediately parting company with the surface thereby leaving an area of partial vacuum which spoils the lift and may even destroy it completely and cause the machine to take a header for Mother Earth.

However, by the simple expedient of thickening the lifting surface and giving its upper face a curvature, or " camber " as it is called, with the deepest part of the resulting wing usually about one-third of the way back from the leading edge, the air flowing over the wing can be persuaded more or less to follow the curvature of the upper face, with the result that the lift thus generated by suction effect is very much greater than that generated by reaction from the air deflected beneath the wing.

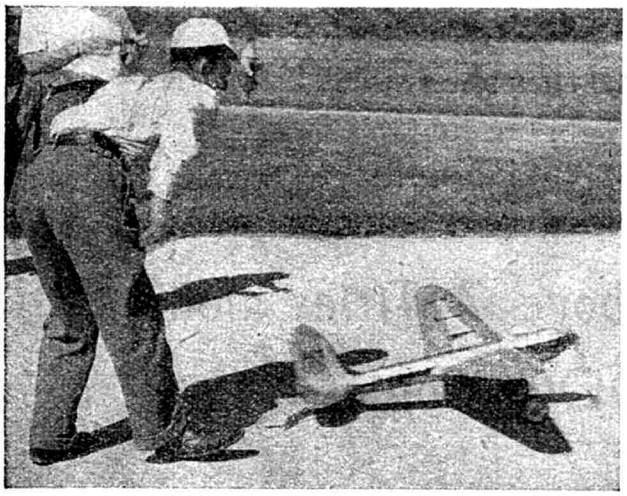
Precisely what form of curvature is given to the surfaces of the wing depends on whether the designer is primarily concerned to obtain speed, weight lifting ability, a flat glide, a high degree of stability, or extreme duration of flight. There are many possible variations of what is termed the wing-section, aerofoil section or airfoil section (an aerofoil or airfoil being a lifting surface) concerning which all I need say at the moment is that the desired section is given to the model's wing by means of its wooden ribs. Study this shape on your working drawings, and seek to reproduce it accurately. Don't attempt to vary it until you know a good bit about wing sections.

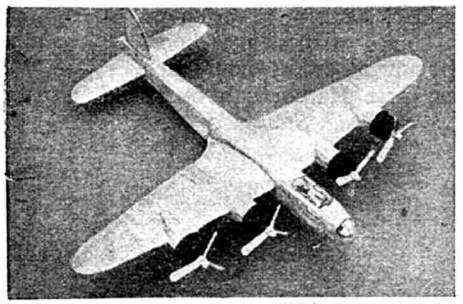



FLIAR PHIL, kept alive only by prolonged gargling with anti-freeze, carefully wipes the accumulated dust of the weeks at Dorland Hall from his battered pencil, and commences with a word of advice to young men—and all others who send him photos.

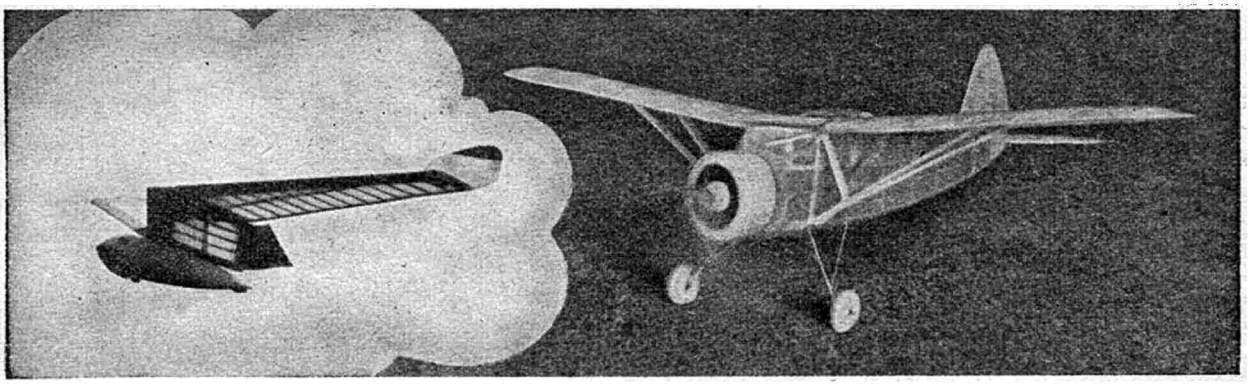
There is a right and wrong way to do most things; here is the gen on the right way to send photos to this or any other publication. For first preference, send a 6 in. by 4 in. (half plate) enlargement *and* the negative (in the case of this journal the negative and a good contact print is sufficient). If for any reason the negative cannot be forwarded, send an enlargement—again preferably half-plate size. Most important of all, the prints must be black and white, not sepia, and *on glossy paper.* If the photo is by a professional check this point, as unless the photographer has been warned, it may be printed upon the matt surface art paper used for portrait work, and will lose much clarity and detail when made into a block for printing. Make sure, whatever the subject, that the photo is really of that subject! If that all sounds a little cryptic, you would get the meaning if you could only see some of the many photos received during the year, labelled "Here is my latest model . . ." which afford an excellent local view but little else. In all fairness, there is often a little speck somewhere in the sky, but that could be anything from dust on the negative to an overlooked barrage balloon, or a seagull practising Stuka tactics, to spots in front of the eyes. The readers, the rest of the readers, do like to read a description and see the facts for themselves, not imagine them, so do keep the subject as large as possible. Next point, write your name and address on the back of each print, with a brief description of the model, e.g. "28 in. span duration model," or "1/72nd scale Spitfire." Full details should be typed or written clearly on a piece of paper which must then be lightly affixed to the back of the photo by means of a thin layer of photo paste along the top or one side only, so that can be removed if desired. Don't be afraid to give plenty of information—too much is just the right amount. The salient features and the most interesting details can be picked out when it gets here, without coming across the old trouble that occurs with a short caption—only one or two details which are never the most interesting anyway! So when you next send in a shot of that "latest model," give plenty of gen, please, and your old pal Fliar Phil will allow a happy smile to flicker over his miserable countenance.



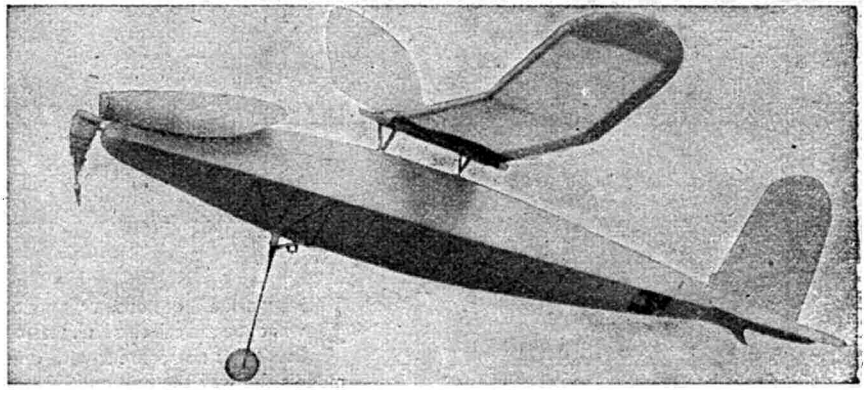


To business and our Model of the Month. In all probability more first-class flying scale models have been replicas of the Lysander than of any other machine. Amongst flying scale enthusiasts the Lizzie seems to remain a staunch favourite, and this outstanding replica is a shining example of fine construction and careful covering. A. Robson of the Hawick M.A.C. built the machine from Howard Boys' famous A.P.S. design, and we look forward to receiving some action pictures in the future. Here's hoping, with such a beautiful model, they may all be Happy Landings!

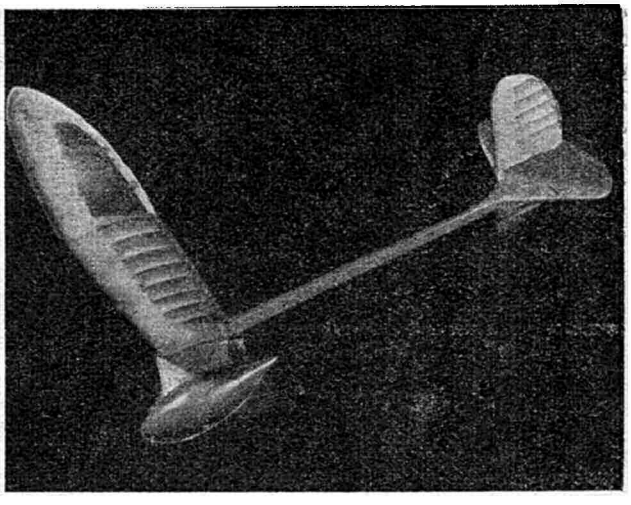
Very few have been the successful models driven by compressed air in this



country, and nowadays general interest in this form of propulsion seems to have practically died out. It is interesting, therefore, to see that even amidst a plenitude of diesels, experiments are still progressing on the Continent where enthusiasts of the unorthodox are even more plentiful than in this country. Second photo on the left shows an Italian compressed air machine powered by a five-cylinder engine taking off in a contest for such models. Fliar Phil knows that there are one or two old hands still interested in this country. How about hearing from them ?



Congratulations to young reader Samuel Dick of Aberfel, who has successfully built and flown the 40 in. span Stirling shown in Photo 3, at the age of fifteen. The model is rubber powered, the motors being set at an acute angle from the nacelles to the interior of the fuselage. Sam took four months to build the model in his spare time, and writes that his best flight so far has been around forty yards, which is not at all bad. Still better flights to come, Sam !

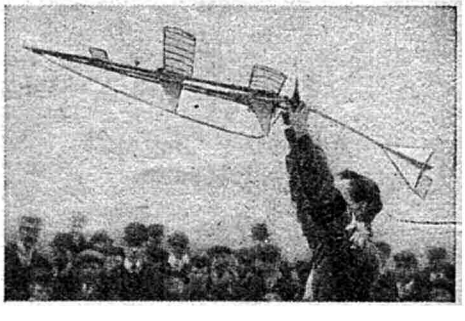


Top left, Photo 4, is a view of an 80 in. span tailless glider designed and built by R. F. Connor of Heston, a previous winner of the Handley Page Trophy. The model, which is pleasantly conceived, weighs 23 ounces and is experimentally fitted with double reflexed flaps to achieve really good longitudinal stability. The gull wing design is there for more than looks, too, as it enables the C.G. to be kept low and helps to prevent yawing on the line. The photo is the work of F. A. Finch.

This month it is a flying scale modeller's beanfeast with yet another example in Photo 5, top right. J. G. Grant, President of the Montrose M.A.C., is the builder, and the model is a 29½ in. span Fairchild Argus. The photo was taken by K. Hay.

Another young reader, D. B. Laws of Westcliff-on-Sea, turned out the excellent Dusty VIII illustrated in Photo 6, on the right. Fliar Phil is sorry he had to remove the builder from the photo, but it really was necessary in order to get it in.

Down one to Photo 7 which is of an original glider design by R. Conner of Bow. It is a relic of the past unfortunately, as this model met its end on a windy day at Epsom last year. Span was 5 ft. and the aspect ratio 14·5, writes Mr. Conner. However, Fliar Phil ventures to question the latter figure as the photo makes it hard to see how it can be much more than 10. Perhaps it's the arithmetic at fault. Anyway, a second version is under construction with suitable modifications. Better luck *this* time !

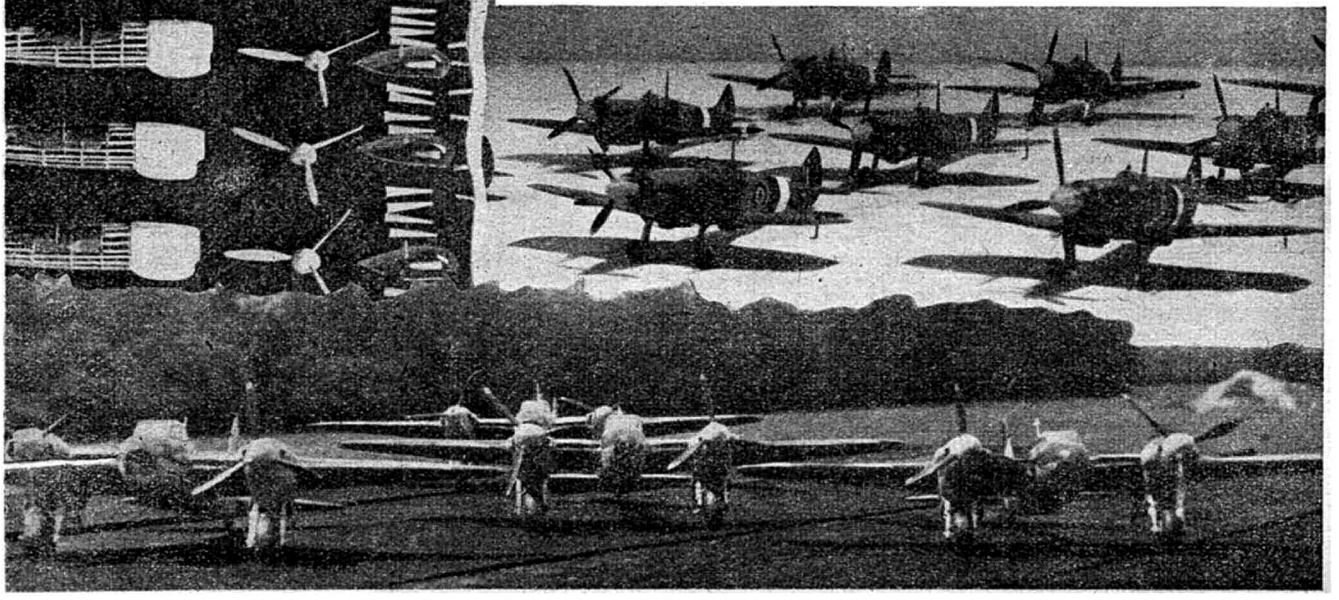


Last on our list this month is another of our ventures into time—a historic photo dug up, or perhaps I should say out, for you by R. Fear of Smethwick, Staffs. What would you class it as—a tail first, head first ? Whether the gent in question is in an official capacity is not stated ; the armband might mean mourning, a pessimistic attitude fully justified, however, by the relative positions of empennage and launcher's head !

Fliar Phil drops his pencil and rushes off to pick the first snowdrop, softly ploughing its way up through the mud at Eaton Bray . . . .

# MASS PRODUCTION BY MASSEY-COLLIER!


IT'S a "pride" of lions, a "gaggle" of geese—Fliar Phil wants to know what you can call this? G. Massey-Collier, of the Camera Dept., Denham Studios is not content with one model at a time. He likes to see his models the way the real ones are, in-in-well, whatever that may be. As a result he turns out prodigious quantities of each type of model, finally giving them away to clamouring friends whose initials appear as the squadron letters. Six flying-scale Typhoons, and an assortment of 1/72nd solids including six Beaufighters, eight Mosquitos and nine Spitfire XIIs, make up the collection at the time of writing. Cunning photography and realistic models make a pleasing combination, and Mr. Massey-Collier wins laurels for his efforts shown on this page. Note particularly the clever use of the wind to achieve genuine rotation of the Typhoon's props. That's a master touch! And what is Mr. Massey-Collier doing now? Apart from a model tank production line, and taking photos, he has gone all conservative and is solemnly building one, repeat, just one, petrol model!!



# Readers' . . . . . Letters

*The Editor does not hold himself responsible for the views expressed by correspondents. The names and addresses of the writers, not necessarily for publication, must in all cases accompany letters*

DEAR SIR,

I read with great interest the admirable 1946 Club Survey by "Clubman," published in the December issue of the AEROMODELLER. This survey is, I think, the best thing of its kind that has so far been attempted and I congratulate Clubman on the result of his efforts. The figures which he gives are very illuminating, and should serve as a useful guide to those of us interested in the organisation of the hobby.

I would like to draw your attention to two points of the article. The 16·8 per cent. of the known clubs affiliated to the A.B.A. I believe does not include a further 10 clubs which have affiliated, bringing our percentage to about 20. I would point out to you that this has been achieved in two years.

I cannot quite agree with the statement—only 6,000 under National guidance out of a potential 200,000. In the first place the six thousand affiliated people in the Club movement are not the only people under National guidance. We in the A.B.A. who do not belong to the Club movement are under National guidance and other organisations have their individual membership apart from the Club system. Although these numbers would not bring us anywhere near 200,000, they would make an appreciable difference to the figure.

Then there is the fact that the large organisations such as the Air Rangers, the B.O.P., Flying League and the A.T.C. are also under National guidance. The first two are mentioned in the article, and while I agree that it was policy to omit them from the figures of Clubs, they do increase the 6,000 figure by a considerable amount.

B.A. Germany. CHAIRMAN, A.B.A.

DEAR SIR,

Having been away at college this fall, your October issue caught up with me rather belatedly. Mr. Laidlaw-Dickson's article on ornithopters was extremely interesting to me, and it should encourage a great deal of experiment in this neglected field of modelling. However, I should like to bring up a point in connection with the definition of an ornithopter. The birds secure not only their propulsion but also their lift from flapping wings, and it seems logical that a true ornithopter model should do the same. Some of the designs pictured in the article are only semi-ornithopters to my viewpoint; for instance, Mr. Lippisch's model shown on page 669, while a very successful flier, is actually about 60 per cent. glider and 40 per cent ornithopter—a sailplane with an oscillating vane for a propeller. Obviously a craft of this type could pick up thermals easily and turn in long flights. My latest ornithopter is not entirely devoid of the fixed lift section to which I object, having about 15 per cent. of its wing area in the form of a cambered panel between the flappers. I am working towards its complete elimination without loss of duration. Since setting a new American record of 43·8 seconds in September, this design has been flown in calmer weather and with better rubber and has reached 1 : 20 without thermals.

This model is simple and inexpensive to construct, and has inherent stability and efficiency to the degree that the average modeller should be able to obtain flights of 30 to 45 seconds consistently.

Missouri, U.S.A. PARNELL SCHOENKY.

DEAR SIR,

In the Christmas AEROMODELLER a member of the Luton Club stated that he had trouble with his diesel engine when his 'plane was climbing into a cold wind. I think this is due to the ether liquefying when cooled and compressed. The wind has cooled the fuel in the cylinder and then liquefied on the compression stroke and naturally the engine would not fire when the fuel was in a liquefied state.

Yours truly,

Leeds, 8. B. TURNER.

*The answer to this problem is to cowl in "diesel" engines. Several enthusiasts have confirmed an improved performance from enclosed engines.* (ED.)

DEAR SIR,

I have just come in from flying my A.W. 10 tailless (illustrated at foot of page) and thought you might like to have some additional information on how it behaved.

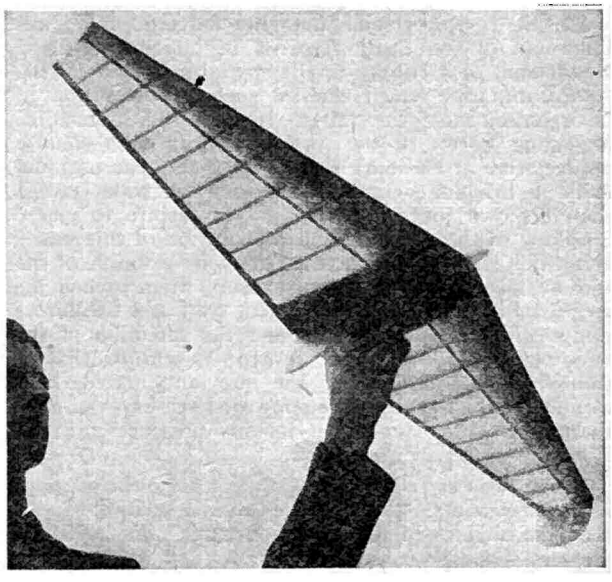
A recent issue of the AEROMODELLER described the A.W. 10 tailless glider, and in case readers are contemplating building one, may I give them some idea of what to expect. Tailless models at any time are more difficult to trim and fly than the ordinary fuselage type of model, and the A.W. 10 proves no exception. But you have in it a model of great promise. It is simple in both design and construction, but this in no way detracts from its efficiency.

There are, however, many constructional points which I think could be improved upon. First, to cover a leading edge of such size, 1/64 in. sheet is useless. It sags, and droops worse than tissue. 1/16 in. sheet would do fine, and would lessen the amount of weight needed in the nose. Single covering of tissue leaves the surface too weak to stand torsion splits. Either double cover, or silk.

Tip fins should never be firmly stuck on. Either lightly glue, or hold them on with loose dowels, better still press studs if you can fix them on firmly.

The wing structure is quite strong enough, but for the centre ribs, which I think should be covered with sheet to stop the tissue pulling the ribs away from the base rib on the fuselage. Another thing, ⅛ in. dowels are hopeless, even with 3/16 in. dowels my own model's wings have quite a lot of play. A longer nose moment would enable less weight to be used, and I suggest a form of skid or shock absorber here. I have found that a better glide is obtained if the model is trimmed slightly nose heavy; I say glide, it isn't exactly a glide. It just soars like a bird, and upon meeting a gust of wind climbs away with complete stability. A long skimming motion follows every hand-launch with a slow climbing turn to follow, but be very careful of warps, and bad trimming of the nose weight, as this longitudinal stability is an extremely delicate thing. Anyway, you build one, the plans are worth the money (this isn't flannel either!) and I am sure with even a few of the small amendments I have suggested you will have an extremely efficient soarer—not glider.

Southampton. P. T. GUILMANT.



# DORLAND HALL 1946

By D. J. LAIDLAW-DICKSON

BRITAIN'S Third National Model Aircraft Exhibition was opened on Thursday, 12th December, by Lord Henderson, Additional Member of the Air Council, in the absence of the Rt. Hon. Philip Noel-Baker, M.A., M.P., the Air Secretary, who was unable to perform the ceremony in view of pressing Ministerial duties. In his speech, Lord Henderson laid great emphasis on the wide interest displayed in model aeronautics, and congratulated the organisers on attracting so talented an entry to the contests. He felt that an immense amount of good was done by these annual exhibitions, and that the publicity resulting was of considerable benefit not only to the aeromodelling movement, but to all branches of aviation. He made his speech the occasion for an important announcement regarding the future entry of cadets to the Air Force.

Mr. E. T. Robertson, Managing Director and Vice-Chairman of the *Daily Express*, in introducing Lord Henderson, paid tribute to the specialised talent of the AEROMODELLER, which enabled such an exhibition to be organised each year. Mr. D. A. Russell, M.I.Mech.E., Managing Editor of the AEROMODELLER, was equally appreciative of the part played by that great national daily in bringing aeromodelling to a far wider public than his own journals could, as yet, aspire to reach. Speaking of the planning and preparation of this year's exhibition, Mr. Russell gave an amusing example of the thoroughness that went into every item, when he recalled the spectacle of workmen, staff and exhibitors jumping on the false floor under the direction of the architect and the district surveyor to ensure that it would support crowds of the size anticipated. He wound up the opening ceremony with an expression of thanks to Lord Henderson for his presence and the Air Ministry for their support.

The crowds attending the exhibition from the moment its doors were open to the public leaves no possible doubt that the alliance of the AEROMODELLER and the *Daily Express*—each pre-eminent in its own sphere—has done much to attract a new influx of future enthusiasts to aeromodelling and bring its virtues before a far wider public than ever before.

## The Exhibition as a Whole.

While it may have seemed impossible to so ring the changes in an exhibition within the fixed confines of Dorland Hall, Mr. John Lansdell, F.R.S.A., who was again responsible for the layout, achieved the theoretically impossible feat of increasing the floor area by nearly one-third. This involved the erection of an immense false floor, built up on cunningly concealed steel scaffolding, and the installation of an additional staircase. In the whole history of the hall this is the first time that such a false floor has been erected, though we understand that a number of future events will be following this courageous example. This innovation enabled a whole section to be devoted to the display of models in flight, which have proved an irresistible attraction to visitors of all ages. At times the carefully thought out arrangements for the circulation of visitors have been brought to naught by the enthusiasm of visitors to see the models go round again. As might be expected, it proved no light task to keep all the aircraft in constant service, and a skilled " ground crew " was hard at work servicing spare machines at all hours of the day and night in order that there should be no empty runways.

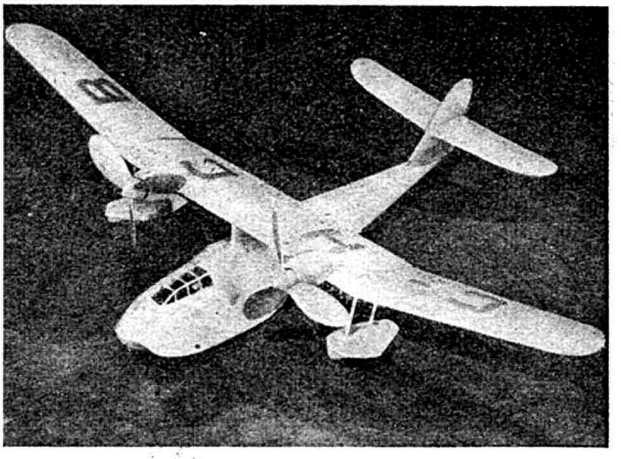
This year visitors have been quick to note that emphasis is everywhere laid on quality rather than quantity. In the past, as many models as possible had been crammed into the show cases, for it was felt that this was the aeromodellers' own show where, irrespective of prizes, they would like to see their models. This was an excellent idea so long as it remained a friendly, informal affair, but the hobby has grown to such large proportions now that aeromodellers must be careful just what they should show to the general public, seeing model aircraft, perhaps, for the first time. Therefore, at the risk of a few heartburnings, a very

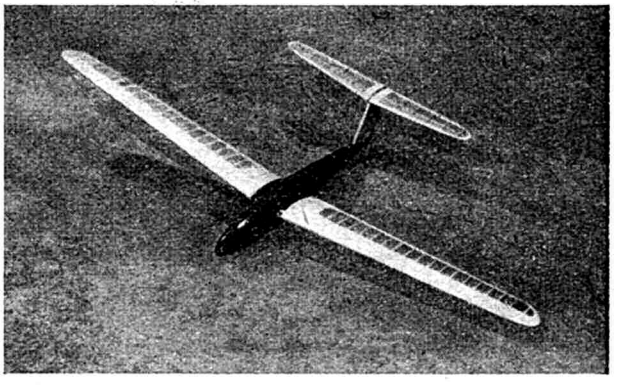
rigorous selection committee chose only the really outstanding models, and laid them out to the best advantage. Last year the uninformed comment was: "Aren't there a lot of them!" This year it pays the sincere compliment: "Aren't they marvellous!." Models which made the grade were all prizewinners, or so near to the prize list as to merit high commendation. Each and every entrant whose model was on show can say with pride that he was an exhibitor at Dorland Hall, and in so saying will convey no mean impression of his skill.

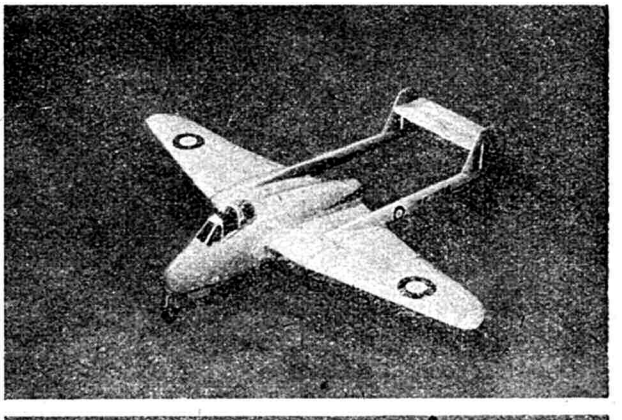
To those whose models remained, alas, below in "the dungeon," we would express our thanks for entering, and our commiseration that there was not room to hang many more really beautiful models sent in. We hope they will compete again next year, when, perhaps, it will be possible to show a wider range. There is no doubt that many models which would have taken prizes last year failed even to pass the selection committee on this occasion. The outstanding advance in quality was amongst the flying models, particularly in the junior classes. On several occasions it was necessary to check back on the entry forms to make quite sure that the entrant was in fact a junior, so high was the quality of workmanship and original design. The solid and non-flying entries were, as expected, less strong in numbers than before, while flying models were correspondingly increased, to give a total entry more than half as large again as in previous years. Bulk for bulk, there were many hundreds of square feet more of wing area assembled, which made the reception staff's work more arduous than usual. Reception and collection arrangements were, however, well able to cope with this, and it is hoped that fewer than one per cent. of models will have suffered damage in transit or handling.

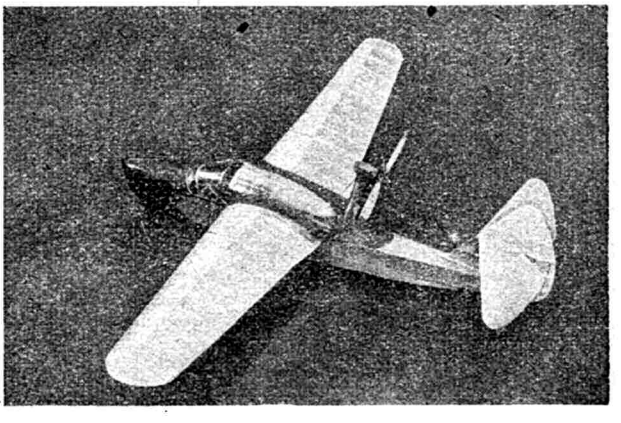
A welcome sign was the large number of entries in the tailless competition, which was numerically the fourth largest in size, while the experimental class and free-lance petrol engine sections were strong in quality. A further post-war year has brought a great increase in interest in power modelling, so that large numbers of petrol and diesel-engined models were noted. In spite of smaller numbers, the quality of solid work was higher than before, which seems to suggest that a hard core of true enthusiasts are keeping the flame burning, and with the variety of materials now available, only those who really want to devote their main interest to solids are being recruited to their ranks.

Under the direction of Sqdn. Ldr. Peter Hunt, the Eaton Bray Research Department produced a number of outstanding models that flew many miles each day above their elevated runways. There is considerable difference of opinion as to which model proved the most popular. The issue lay between the D.H. Vampire, driven by a real air-jet, and equipped with fully retracting undercarriage, and the standard Dorland, fitted with floats, which was catapult-launched from the flying basin. Perhaps, with traditional British fondness for anything associated with water, the Dorland won the day, for, added to its usual polished performance, was the risk each time of a spectacular "prang." These prangs were a quite unrehearsed part of the spectacle, for model catapult launch has all the uncertainty of the full-sized prototype, which

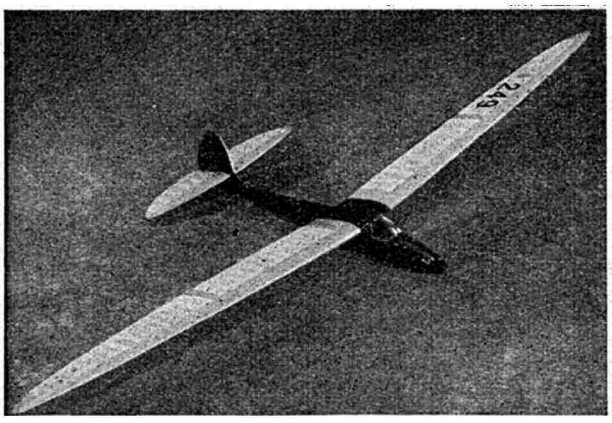


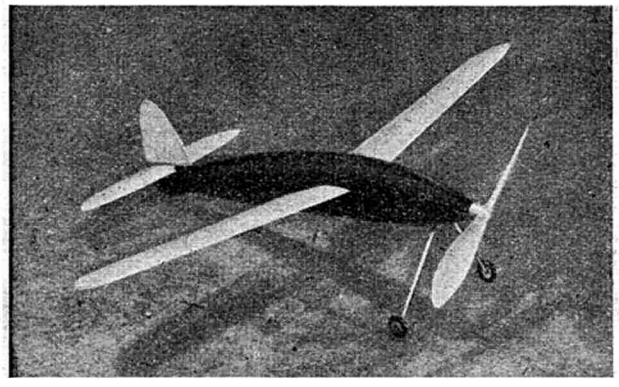


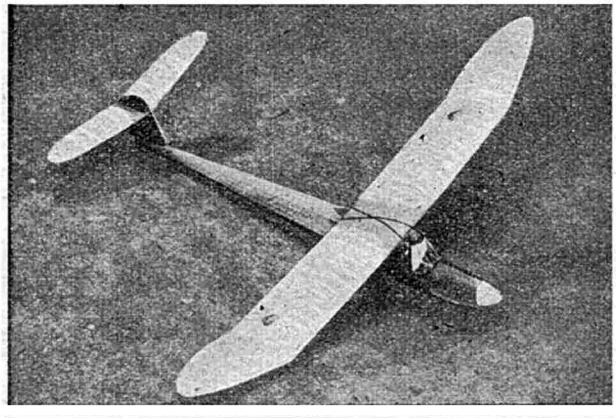


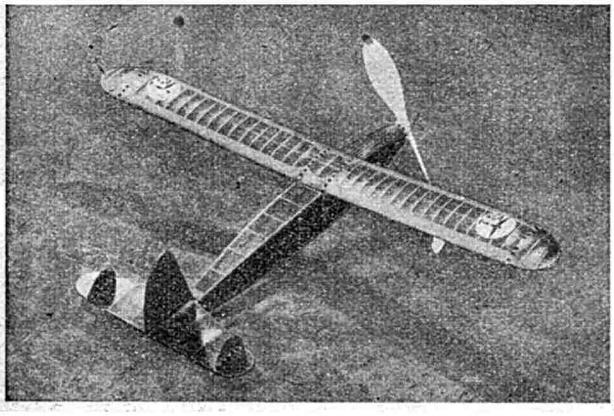


*From top to bottom models are as follows :—*
*H. C. Baines' "Sundaleena";*
*L. E. Sharp's 46 in. span streamlined sailplane,*
*A. J. Cockles' rocket propelled Vampire; and*
*A. Webb's Spencer Larsen amphibian.*









added a little more to the interest and a lot more to the worries of the service personnel.

The Vickers Viking, now in its third thousand miles, showed its paces as gracefully as ever, while Jackdaw and Dorland, as modified for electric r.t.p., made a great appeal to enthusiasts, as being very suitable trainers for their own initial efforts in that direction.

An extensive trade section was kept busy all day supplying the needs of aeromodellers who only once a year have this opportunity of selecting their kits and accessories from the leading figures in the industry, gathered under one roof, and staffed by aeromodeller-proprietors who have done so much in the past to make model aeronautics what it is today. In addition to old friends there were a number of newcomers to the model aircraft industry making their first bow to a critical audience. We hope their début will be attended by a volume of future business and the beginnings of many lasting friendships.

### Amongst the Prizewinners.

The advance posting of prize tickets on models made the visitors' task much easier than before in agreeing with the judges' verdict—or otherwise. With so many splendid models it was no easy task to make a final choice, but we have every confidence that the majority shared our views on the prize allocations. No one, we are sure, will quarrel with the magnificent 7 ft. span Mercury IV petrol-engined high-wing model that secured Senior Champion Trophy. This model is the work of R. H. "Mick" Smith of Wolverhampton, who, it will be remembered, has so often been the subject of AEROMODELLER appeals for last known address! Mick built Marks I and II while serving with the R.A.F. in Rhodesia, and was able to get some good flying time in while, in this country, we were still grounded during the ban. Marks III and IV were built in England, and have been flown in contests during the past season. A cursory glance is hardly enough to do justice to this model—finish can be seen and appreciated, it is true, but much of the detail layout must be missed.

The small cabin door actually opens, and is used to handle the working controls fixed in the cockpit, which comprise choke, throttle and ignition levers, the former being push-pull knobs and the ignition adjusted on a quadrant. Readers will be pleased to learn that plans of this interesting machine will shortly be appearing in AEROMODELLER Plans Service, and should be ready in time for many examples to be flying in the 1947 Power Meetings. Power unit fitted by Mick is a Forster 99, but any other motor of equivalent power would serve the purpose, or, of course, a 5 c.c. diesel.

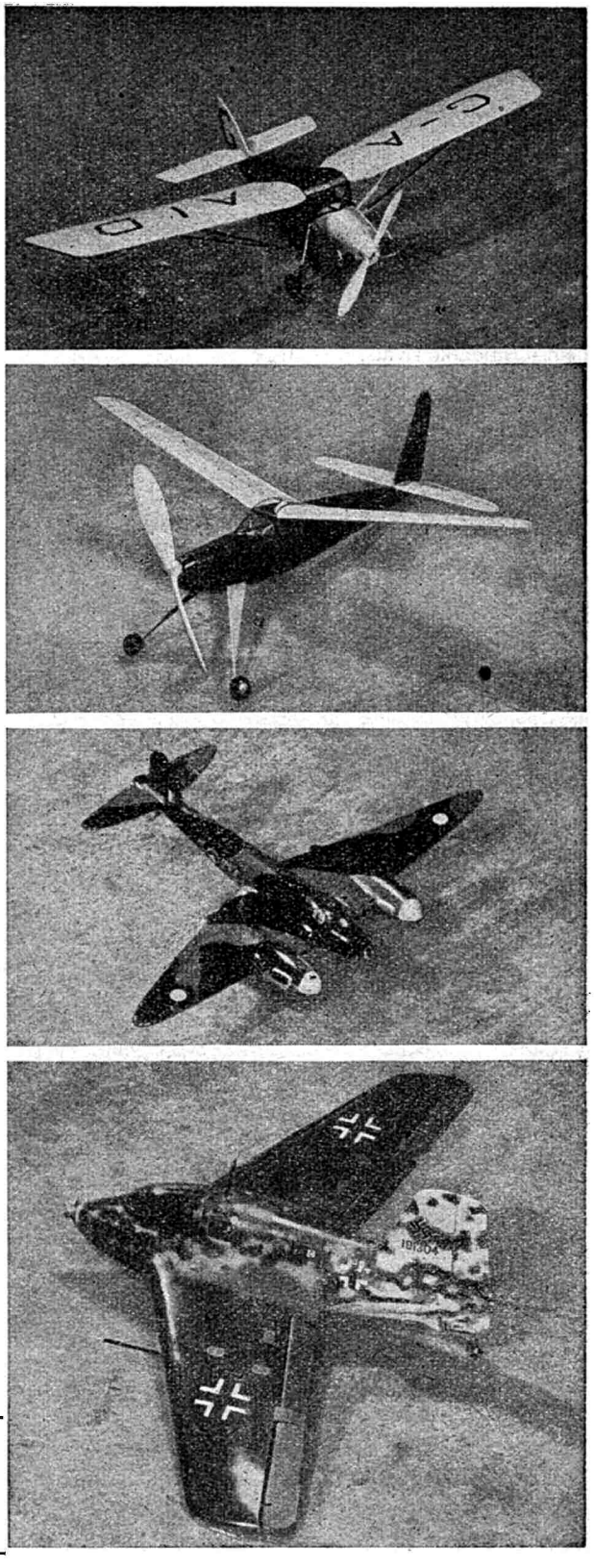
Raymond Jessop, of Addlestone, Surrey, took the Junior Champion Trophy with his Wakefield model, "Thermal King." This own design by a junior is exceptional, not only for its finish, but equally for its conception. It embodies a streamlined fuselage, with single-wheel undercarriage, elliptical wings and the usual folding propeller. Retraction of the mono-wheel is effected by a built-in timer which slowly withdraws it after a predetermined time. This obviates the old bogey

*From top to bottom again we have :—*
*K. S. Raczak's 249 "Olympic" sailplane ;*
*C. R. Clarke's "Dolphin II" Wakefield model ;*
*R. Porter's "Bill White" sailplane and*
*B. Wildman's semi-streamlined Duration model.*

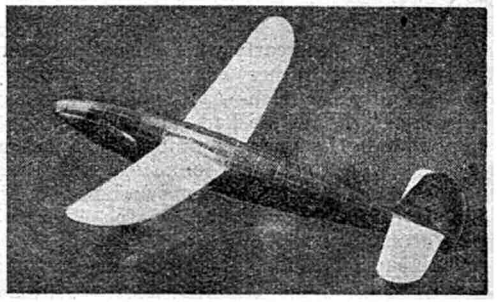
of retracting undercarts which usually perform on the take-off board rather than in the air. Raymond apologised for the finish—as if apology were necessary !—and explained that he had spent so long in the design stage that he had hardly time to complete the model for the exhibition. We look forward to some more notable models from this young designer, and hope to be able to offer plans of his winning Wakefield in the near future.

Next came the display of winning Dorland models. The Dorland Model Building Contest, introduced for the first time this year, produced so hearty a response that an annual Dorland design will be produced and the trophies awarded annually. The three national winners in both Senior and Junior Classes were on display, and demonstrated the variety of possible treatments that can render beautiful a standard airframe shape. The two schools of thought were exemplified by the winners, who relied on decoration in pleasing colour schemes, and those who scorned such embellishments and scored with sheer perfection of covering and highly-polished wood surfaces. It is always possible to cover minor imperfections with a liberal brush of coloured dope; in selecting winners this was taken into consideration, and only perfect colour schemes could qualify. The " plain finish school " were content with white tissue and banana oil on the woodwork. Here every blemish would have shown, and careless marks have spoiled the finish. We can only compare the models with flowers, where no one can make rules to separate the merits of, say, a snow-white lily and a flaming orchid. In the face of strong competition Mr. G. Graham, of Newcastle-on-Tyne, took the Senior Trophy, while D. C. Morris was a worthy winner in the Junior Section. Qualifying times are of interest, the highest recorded area winner's figure being A. F. Freeman, of Gillingham, with 89 secs., followed by W. H. Sharman, of Scunthorpe, Lincs, with 80 secs., while a junior area winner and National Junior third, K. J. A. Strowlger, of Rayleigh, Essex, clocked 78 secs. Others were evidently careful of their models and put up figures only a few seconds in excess of the qualifying times. All Dorland builders will, however, have an opportunity at Eaton Bray, next summer, of proving that their models can beat the National winners on the flying field !

Class winners in the Non-flying Classes showed a pleasing variety of type, and demonstrated the growing interest in the less usual prototype as well as the latest aircraft in production. In the 1/72nd scale and under, G. C. Parry took Senior Prize with a D.H. Hornet, while in the Junior Section, D. Ixer-Pitfield won with his Hall P.H.3, and also took third prize in the same class with a Short 200 Canton Une. George Temple's Messerschmitt 163B was a finely detailed winner in the over 1/72nd Senior Class, and well in the short list for Champion. Junior Prize in this class was taken by a girl—Miss Ann Evans, of Foxhall, near Ipswich. We congratulate the fair sex on breaking into yet another masculine stronghold. Her D.H. Mosquito was a delightful example of careful work. We hope many



*At the top we have :—*
*V. Hillman's A.B.C. Robin ;*
*C. W. Bastin's CB.2 Duration model;*
*Miss A. Evans' D. H Mosquito, and*
*L. G. Temple's Messerschmitt 163B.*



"Mercury IV," the Senior Championship winner and "Thermal King," Junior Championship winner.

more girls will be encouraged by this to take up a hobby at which their feminine delicacy of touch should make them formidable rivals.

The Rubber Duration entries were many in number and Bernard Wildman is to be congratulated on his winning semi-streamlined model, as must Colin Bastin, the Junior Class winner, for his own design C.B.2. The Wakefield Class fell to C. R. Clarke with Dolphin II, one of the most elegant streamlined models we have seen for a long time. Sheer fine workmanship made its place unassailable. We have already spoken of Raymond Jessop's winner in the Junior Class. It is noteworthy that Sgt. W. A. Dean, whose successes on the flying field will be recalled, took third prizes in the two duration classes with "Competitor" and "Contestor." We understand that these two models, and yet another, were all made in his R.A.F. spare time over three weeks. Bill Dean must be a fast worker, or the R.A.F. more liberal in spare time than we have heard!

The quality of the Flying Scale entries was another surprise. Year after year these models seem the Cinderellas of the flying field and we had grown accustomed to small numbers and only moderate workmanship. However, we were pleased to find them every bit as good as the Duration classes, and very hard to separate into the winners. A. J. Cockle's rocket-propelled D.H. Vampire possessed the high finish we should expect from this Northampton enthusiast. We were glad to see Mr. L. W. Hastings, of Morden, again entering the competition field with his second prize winner—a grand rubber-driven Gloucester Gladiator. V. Hillman's Junior winner—an A.B.C. Robin—bore out our contention that this machine is one of the most suitable for scale model enthusiasts.

The grouping of both flying-boats and seaplanes under the heading of Waterplanes produced a preponderance of flying-boats, for which we take some part of the credit by virtue of the recent series of articles in the AEROMODELLER Harry Baines, of New Cross, well-known Blackheath M.A.C. clubman, took a deserved first place with his "Sundaleena" flying-boat, a twin-engined, bevel-gear, rubber-driven model, finished in the attractive Sunderland white enamel. We resisted an impulse to carry out flotation tests on the Dorland basin, but have hopes of seeing it airborne in the New Year. A Spencer Larsen Amphibian by A. Webb, of Eltham, S.E.9, was an ambitious Junior winner—and is quite the best example of this aircraft we have seen since Mr. Towner's original. Fred Patey, another last year's winner, took third place in the Senior class with his "Seasprite" flying-boat. Only seaplane winner was J. E. Wingate, of Battersea, who took the Junior second with a delicate 24 in. span duration type that looked full of flying.

Division of the Sailplane Class according to size made the judges' task rather simpler. Winner was J. E. Sharp, of Feltham, closely followed by F. Humphris, of Witney, with a "Tarpon," and a miniature "Ventura" from K. A. Landon, of Watford. A "Bill White" sailplane by R. Porter, of London, won the Junior class, and was an excellent example of junior craftsmanship.

The Open Sailplane Class fell to a scale model sailplane —a 249 Olympic—by K. S. Raczak, of Nottingham, with Geof. Dunmore's previous winner, Socrates, in second place.

The popular Evander came third, built by Kenneth Banks, of Morden. A special was awarded to Mrs. Eves for her well-finished high aspect ratio Zeus, another A.P.S. favourite, of which several examples were entered.

Squadron Leader Hunt makes adjustments to the Dorland Floatplane in the seaplane pond at Dorland Hall.

★ ★ ★ ★ ★ ★

# The Prizewinners

*On the left is R. H. Smith, Senior Championship Winner, and on the right Mr. D. A. Russell presents the Trophy to the Junior Champion, Raymond Jessop.*

★ ★ ★ ★ ★ ★

**COMPETITION No. 2A.—NON-FLYING MODELS 1/72nd SCALE AND UNDER** (*SENIOR*).
(1) G. C. Parry, 62, Chandos Avenue, Whetstone, N.20. (D.H. Hornet.)
(2) D. W. Jackson, 120, Grove Lane, London, S.E.5. (Avro Tudor II.)
(3) R. E. Piercy, 9, Waddon Close, Waddon Road, Croydon, Surrey. (Handley Page O/400.)

**COMPETITION No. 2B.—NON-FLYING MODELS 1/72nd SCALE AND UNDER** (JUNIOR).
(1) Dennis Ixer-Pitfield (age 16), 8, Drayton Way, Kenton Road, Kenton, Middlesex. (Hall P.H.3.)
(2) Roger Stevens (age 15), 38, St. John's Road, Slough, Bucks. (Vickers Viking.)
(3) Dennis Ixer-Pitfield (age 16), 8, Drayton Way, Kenton Road, Kenton, Middlesex. (Short 200 Canton Une.)

**COMPETITION No. 2C.—NON-FLYING MODELS ABOVE 1/72nd SCALE** (*SENIOR*).
(1) L. George Temple, East Mersea, Colchester, Essex. (Messerschmitt 163B.)
(2) Maurice Crisp, 39, Elmcroft Avenue, Sidcup, Kent. (S.E.5.)
(3) Bruce V. Manders, 3, Lansdowne Crescent, Worcester. (D.H.2.)

**COMPETITION No. 2D.—NON-FLYING MODELS ABOVE 1/72nd SCALE** (*JUNIOR*).
(1) Miss Ann P. Evans (age 16), Foxhall Place, Foxhall, Near Ipswich. (D.H. Mosquito.)
(2) Dennis Bryant (age 15), 7, Darfield Road, Brockley, S.E.4. (Albatros D.V.)
(3) C. Travis Sutton (age 14), "Winrush," Heathray, E. Horsley, Surrey. (Rolls-Royce Derwent I Jet Unit.)

**COMPETITION No. 3A.—RUBBER DURATION MODELS TO ANY SCALE** (*SENIOR*).
(1) Bernard R. Wildman, 76, Huxley Road, Edmonton, N.18. (Semi-streamlined Duration.)
(2) L. P. Mackenzie, 30, Victoria Terrace, Dunfermline, Fife. (28 in. Shoulder Wing.)
(3) Sgt. W. A. Dean (R.A.F.), 249, Melfort Road, Thornton Heath, Surrey ("Competitor.")

**COMPETITION No. 3B.—RUBBER DURATION MODELS TO ANY SCALE** (*JUNIOR*).
(1) Colin H. W. Bastin (age 15), 21, Testcombe Road, Gosport, Hants. (C.B.2.)
(2) John R. Thimidis (age 15), 12, Avon Road, Brockley, S.E.4. (Wakefield.)
(3) Dennis G. Hazell (age 15), 12, Ashenden Road, Guildford, Surrey. (Duration.)

**COMPETITION No. 3C.—"WAKEFIELD FORMULA" RUBBER DURATION** (*SENIOR*).
(1) C. R. Clarke, 29, Handside Lane, Welwyn Garden City, Herts. (Dolphin II.)
(2) Derek F. Proctor, 17, Esher Avenue, North Cheam, Surrey. (Wakefield.)
(3) Sgt. W. A. Dean (R.A.F.), 249, Melfort Road, Thornton Heath, Surrey. ("Contestor.")

**COMPETITION No. 3D.—"WAKEFIELD FORMULA" RUBBER DURATION** (*JUNIOR*).
(1) Raymond Jessop (age 16), 2, Burleigh Park Road, Addlestone, Surrey. ("Thermal King.") JUNIOR CHAMPION.
(2) Alec Clark (age 16), 10, Elsley Road, Lavender Hill, S.W.11. (Wakefield.)
(3) John R. Warren (age 16), 17, Queen's Road, Enfield, Middlesex. (Wakefield.)

**COMPETITION No. 4A.—FLYING SCALE MODELS** (*SENIOR*).
(1) A. J. Cockle, 9, St. Michael's Avenue, Northampton. (Rocket-propelled D.H. Vampire.)
(2) L. W. Hastings, 58, Wandle Road, Morden, Surrey. (Gloster Gladiator.)
(3) B. L. J. Neal, 73, Eastmead Avenue, Greenford, Middlesex. (Miles Kestrel Trainer.)

**COMPETITION No. 4B.—FLYING SCALE MODELS** (*JUNIOR*).
(1) V. Hillman (age 13), 34, Ewell Road, Long Ditton, Surrey. (A.B.C. Robin.)
(2) John Larsen (age 15), 12, Norfolk Avenue, London, N.13. (Moth Minor.)
(3) Victor Milsom (age 13), 84, Forest Hill Road, East Dulwich, S.E.2. (Waco Harrian.)

**COMPETITION No. 5A.—WATER PLANES** (*SENIOR*).
(1) H. C. Baines, 5, Gellatly Road, New Cross, S.E.14. ("Sundaleena.")
(2) F. N. Chiffey, 57, Maple Road, Dartford, Kent. (Flying Boat.)
(3) Fred H. Patey, 22, Diamond Road, Bitterne Park, Southampton. ("Seasprite" Flying Boat.)

**COMPETITION No. 5B.—WATER PLANES** (*JUNIOR*).
(1) A. Webb (age 15), 22, Green Lane, Eltham, S.E.9. (Spencer Larsen Amphibian.)
(2) J. E. Wingate (age 14½), 176, Queenstown Road, Battersea, S.W.8. (24 in. span Seaplane.)
(3) Tony E. Winter (age 15), 2, Arnold Road, Gravesend, Kent. ("Seagull Mk. I" Flying-boat.)

**COMPETITION No. 6A.—SAILPLANES UP TO AND INCLUDING 48-in. SPAN** (*SENIOR*).
(1) L. E. Sharp, 50, Harlington Road East, Feltham, Middlesex. (46-in. span.)
(2) F. W. Humphris, 90, The Crofts, Witney, Oxon. (45-in. span "Tarpoon.")
(3) K. A. Landon, 11, Chester Road, Watford, Herts. ("Ventura.")

**COMPETITION No. 6B.—SAILPLANES UP TO AND INCLUDING 48-in. SPAN** (*JUNIOR*).
(1) R. Porter (age 16), 70, Abbey Road, London, N.W.8. ("Bill White" Sailplane.)
(2) P. A. Rusling (age 15), 132, Burnt Ash Hill, Lee, S.E.12. (46-in. span Sailplane.)
(3) J. K. King (age 16), 23, Overhill Drive, Withdean, Brighton, 6, Sussex. (Semi-scale "Horsa.")
Special: M. J. Butcher (age 14), 72, Rotunda Road, Eastbourne, Sussex.

**COMPETITION No. 6C.—SAILPLANES OVER 48-in. SPAN** (*OPEN CLASS*).
(1) K. S. Raczak, 13, Addison Street, Nottingham. ("249 Olympic" Sailplane.)
(2) Geoffrey E. Dunmore, 22, Kingsway Road, Leicester. ("Socrates" 7-ft. Sailplane.)
(3) Kenneth E. Banks, 73, Churston Drive, Morden, Surrey. ("Evander" 66-in. Sailplane.)
Special: Mrs. May Eves, 157, Plasket Road, Upton Park, E.13. ("Zeus" Sailplane.)

**COMPETITION No. 7.—FREE LANCE POWER MODELS** (*OPEN CLASS*).
(1) R. H. ("Mick") Smith, 186, Penn Road Wolverhampton, Staffs. ("Mercury IV.") SENIOR CHAMPION.
(2) C. A. Shaw, 84, Belvedere Road, Upper Norwood, S.E.19. ("Harpy" 44-in. span, diesel powered.)
(3) Geoffrey E. Dunmore, 22, Kingsway Road, Leicester. ("Captain Kidd," 7-ft. span.)

**COMPETITION No. 8.—FLYING SCALE OR SEMI-SCALE POWER MODELS** (*OPEN CLASS*).
(1) Sgt. Aleksander Welsberg (R.A.F., Poland), 66, London Road, Dover, Kent. (Polish R.W.D.5.)
(2) Richard W. Dorrell, 82, Dolphins Road, Folkestone, Kent. (Westland Lysander.)
(3) Donald K. Wood, R.A.F. Station, Fairoaks, Near Woking, Surrey. (S.E.5, 48-in. span.)
Special: A. J. Cockle, 9, St. Michael's Avenue, Northampton. (Fairchild 91 Amphibian.)

**COMPETITION No. 9.—TAILLESS MODELS** (*OPEN CLASS*).
(1) A. J. Cockle, St. Michael's Avenue, Northampton. ("Scylla.")
(2) H. W. Bexley, 88, Old Road, Linslade, Leighton Buzzard, Beds. (Diesel-powered Flying Wing.)
(3) Gordon R. Mitchell (age 16), 223, Salisbury Avenue, Barking, Essex (74-in. span Flying Wing.).

**COMPETITION No. 10.—EXPERIMENTAL MODEL AIRCRAFT** (*OPEN CLASS*).
(1) A. H. W. MacBean, 73, Bromhall Road, Bedford. (Flying Wing "Minijet" powered.)
(2) Sgt. G. Henwood (R.A.F.), 90, Prince of Wales Road, Kentish Town, N.W.5. ("Hot Donald," Twin-jet Canard.)
(3) Douglas Ethridge, 51, Weston Avenue, Addlestone, Surrey. (Canard Glider.)

**COMPETITION No. 11.—FREE LANCE MODEL AIRCRAFT ENGINES** (*OPEN CLASS*).
(1) K. J. Barnham, 25, Sylvia Gardens, Monks Park, Wembley. (Twin-cylinder Petrol Engine.)
(2) R. J. Trevithick, 64, Barnhill, Wembley Park. (Collection of Diesel Engines.)
(3) H. B. Whall, 29, Gloucester Court, Kew, Surrey. (Diesel Engines.)

**COMPETITION No. 12.—MODEL AIRCRAFT RESEARCH EQUIPMENT** (*OPEN CLASS*).
(1) A. B. Cooper, 28, Westbere Road, N.W.2. (Stroboscope.)
(2) S. H. Rutherford, 172, Carlton Avenue West North Wembley, Middlesex. (Controlled Incidence Propeller.)
(3) M. C. Curties, Flat 3, 7, Robin Hood Lane, Sutton, Surrey. ("Flying Wind Tunnel.")

**DORLAND MODEL BUILDING CONTEST.**
National Winner (*Senior*): G. Graham, 48, Rothwell Road, Newcastle-on-Tyne, 3.
(2) J. R. Clarke, 29, Handside Lane, Welwyn Garden City, Herts.
(3) A. F. Freeman, 78, Shakespeare Road, Gillingham, Kent.
National Winner (*Junior*): D. C. Morris, Shophouse Cottage, Farley Green, Albury, Near Guildford, Surrey.
(2) J. E. Wingate, 176, Queenstown Road, Battersea, S.W.8.
(3) K. J. A. Strowiger, 62, Trinity Road, Rayleigh, Essex.

# AERODYNAMIC DESIGN PART V

BY JOHN HALIFAX

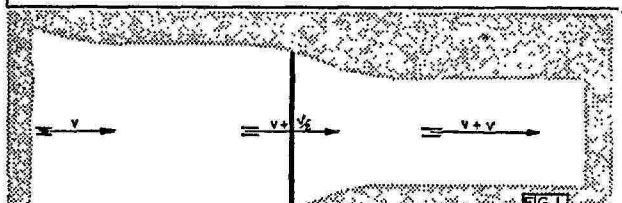



FIG. 1.

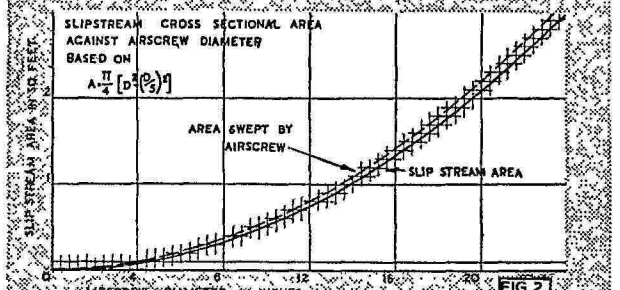



FIG. 2.

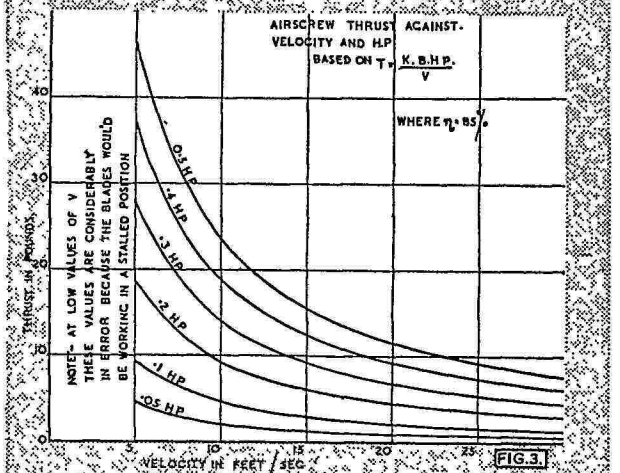



FIG. 3.

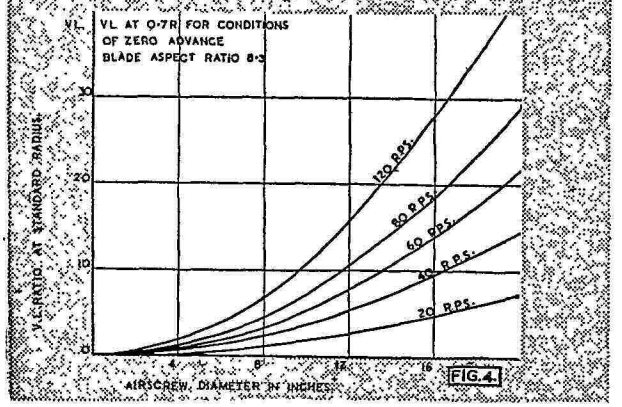
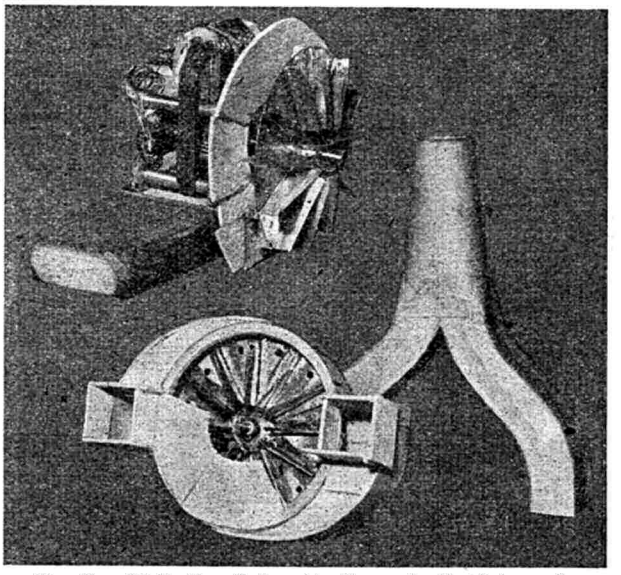



FIG. 4.



*As a digression the theoretical considerations of the Vampire's impeller will no doubt prove of interest to the "slide rule experts." Driven by a 1/9th H.P. electric motor approximately 2 ounces of thrust are developed.*

## Airflow through the Airscrew Disc.

When dealing with rubber-powered models we saw that a good approximation for the axial component of the air velocity through the airscrew disc was given by the valve 1·1V, where V is the forward speed of the aircraft. For petrol model work, however, this is not accurate enough, and we must adopt a more complicated method which I will explain before continuing with last month's example.

Consider Fig. 1. The air just in front of the airscrew disc is being accelerated so that its ultimate velocity is V + v, V being the flying speed, and v the velocity added by the airscrew. Notice that after leaving the disc, the slipstream diameter contracts slightly, resulting in the cross-sectional area being smaller than the area swept by the airscrew. The exact area for model size airscrews is given in Fig. 2, or by the equation

$$A = 0{\cdot}7855\ (D^2 - {\cdot}04\ D^2) \quad \text{.....equation 1}$$

Now for practical purposes it is impossible to compute v mathematically, but an emphirical formula advanced by the Engineering Division of the U.S.A.A.C. gives

$$v = \frac{T}{\rho . A . V} \quad \text{.....equation 2}$$

where $\rho$ = ·00238
A = slip stream area in sq. feet (Fig. 2)
V = speed in ft./sec.
T = airscrew thrust in lbs.

And this looks very much like a vicious circle, since it would seem that we have to know the airscrew thrust before we can start to calculate it! Fortunately, however, there is a way out. We already know the b.h.p. developed by the engine, and, assuming an airscrew efficiency of 85 per cent. (quite an accurate assumption for an averagely good airscrew), we get thrust developed

$$T = \frac{467\ \text{B.H.P.}}{V} \quad \text{.....equation 3}$$

which is quickly solved by Fig. 3. Thus we are now in possession of all the information needed for solving equation 2.

Now it can be proved that the axial velocity at the airscrew is equal to (V + v/2), and this is the expression we must substitute for our previous 1·1V, and, as an example, let us compare the two methods for a typical airscrew.

In a rubber-powered machine we get

B.H.P. = ·015 h.p., D = 16, V = 20 ft./sec., and r.p.s. = 20.

From Fig. 2, slipstream area = 1·23 sq. feet.

From equation 3

$$T = \frac{467 \times \cdot015}{20} = 0{\cdot}35 \text{ lbs.}$$

Then, from equation 2

$$v = \frac{\cdot35}{\cdot00238 \times 1{\cdot}23 \times 20}$$

$$= 7 \text{ ft./sec.}$$

i.e., slipstream velocity = 27 ft./sec.

The old method gives 24 ft./sec. as the answer, involving an error of 11 per cent. (Remember that this method gives slipstream velocity as 1·2V, and not 1·1V, which is the velocity through the disc.)

Now consider a petrol model with a 0·2 b.h.p. engine driving a 15 inch airscrew at a forward speed of 25 ft./sec.

The thrust (Fig. 3) = 3·8 lbs.

$$\text{And } v = \frac{3{\cdot}8}{\cdot00238 \times 1{\cdot}17 \times 25}$$

$$= 54{\cdot}5 \text{ ft./sec.}$$

The error involved in using the 1·2V method is 45 per cent.

*Example :*

Continuing last month's example, we see that from Fig. 3, T = 3·1 lbs., and from Fig. 2, A = 1·0 sq. ft.

Then from equation 2,

$$v = \frac{3{\cdot}1}{\cdot00238 \times 1 \times 30}$$

$$= 43{\cdot}4 \text{ ft./sec.}$$

Therefore, the velocity of the airflow through the airscrew disc is equal to

$$30 + \frac{43{\cdot}4}{2} = 51{\cdot}7 \text{ ft./sec.}$$

Using the new value for v, the actual velocity of the blade element at the standard radius is given by

$$V_E^2 = 0{\cdot}1333\, n^2 R^2 + V_D^2$$

where $V_D$ is the velocity through the disc.

Thus, for our example, we get

$$V_E = 0{\cdot}1333 \times 100^2 \times 14^2 + 51{\cdot}7^2$$

$$= 264,017{\cdot}5$$

$$V_E = 514 \text{ ft./sec.}$$

(*Note.*—It is interesting to notice that in this example the error involved by using the 1·1V method (last month) is only 0·24 per cent. This is by no means usual, however.)

By referring to the performance graph for section N.60, we see that L/D·max. (for infinite aspect ratio) occurs at an angle of attack of 3°, for VL = 26·6, and by the theory of scale effect, it is safe to assume that this is reasonably correct for higher values. Thus we get $C_{DO}$ = ·02 and $C_L$ = 0·92 for this value.

And here I am afraid we must part until we examine the calculation of blade area for a petrol model next month.

**ERRATUM.**

**Owing to a typing error, the Thrust formula in part IV of this series was wrongly given as :—**

$$T = \cdot0001368\, V_E^2\, S\, (C_L \cos\phi - C_D \sin\phi)$$

**This should have been :—**

$$T = \cdot00001646\, V_E^2\, S\, (C_L \cos\phi - C_D \sin\phi)$$

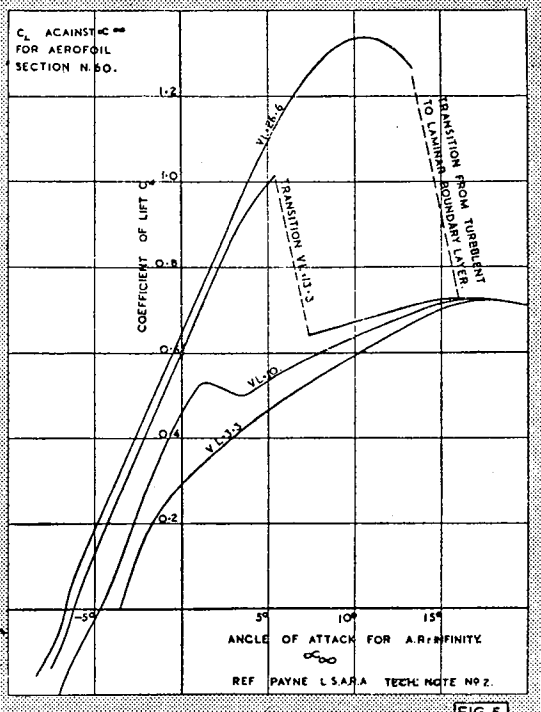



FIG. 5.

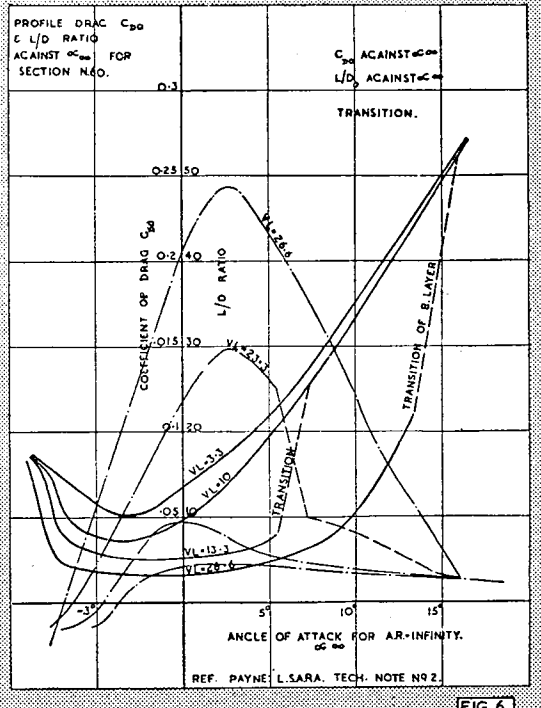



FIG. 6.

# DETHERMALISERS by R. H. Warring

THE 1946 competition season has shown a considerable increase in the application of the dethermaliser—a feature now recognised as an essential part of a modern competition model. Quite a lot was written about dethermalisers in the early days of their development, but much further data has come to light as the result of concentrated efforts during the past six months or so.

Mainly by force of circumstance, the writer decided at the beginning of the 1946 season to use a fuse type dethermaliser—partly because this appealed on account of its undoubted simplicity and partly on account of lack of time and facilities to turn out a number of standardised units of the pneumatic type. The *Zombies* club as a whole agreed to standardise on the fuse dethermaliser—thereby calling only for several dozen yards of impregnated string as opposed to a dozen or more pneumatic units.

The principle of the fuse dethermaliser came from the United States, and the Croydon and Bushy Park clubs were more or less the pioneers over here. Several of the Zombies' members had used fuses during the 1944–45 years—before this club was formed. When the Zombies group was started in March, 1946, any further development was done collectively—a scheme found to work extremely well.

Throughout the season's flying these dethermaliser units have worked extremely well. We have had our failures, but these could be counted on the fingers of one hand and each time we have found the *reason* for the failure and sought to eliminate it. The standard parachute unit shown in Fig. 1 is just about as foolproof as possible.

**The Fuse.**

Experiments with different fuses have been mainly in the hands of W. A. S. Geddie and D. Brockman. It was appreciated at the beginning—and quickly confirmed—that the *quality* of the string employed was of the utmost importance. We have found that the best type is a white, closely-woven string of about ·075 in. diameter known generally as " butchers' string."

The string is soaked in a cold saturated solution of saltpetre (potassium nitrate). A cold saturated solution means simply that as much saltpetre is added to a given quantity of cold water as will completely dissolve—no more and no less. If a super-saturated solution is made, *e.g.* by dissolving an excess of saltpetre in warm or hot water, the excess will crystallise out on the string and cause uneven burning and puffs of flame. Too weak a solution will retard the time of burning.

The standard string used burns at the rate of approx. 1 in. in 75 secs. in still air. During flight the rate of burning speeds up slightly, and we generally work on a figure of 1 in. per minute.

We have produced much slower burning fuses. A figure of 1 in. per 2 mins. can be achieved, but the resulting fuse is less reliable and may go out.

A properly-treated fuse should be very difficult to put out—even if pinched between the fingers. Generally, two or three tries have to be made to extinguish a length of our standard fuse. This simple test should be carried out with every batch of fuse prepared, and the rate of burning checked.

The correct figure for time of soaking was 10 to 15 mins.—this for lengths of about 2 to 3 ft. But we now make up larger lengths in one batch and soak the whole lot for approximately two hours. The string is then removed and allowed to dry naturally.

Failure of the fuse under test will almost certainly mean that the wrong type of string is being used, or the solution is too weak.

**Fuse Failures.**

We have had less fuse failures than failures of the release mechanism, but the faults in the former case have been traced as follows :—

(i) Two lengths of fuse knotted together may go out at the knot. This happened on Gamage Cup day when Brockman knotted an extra length of fuse to the original length to get a longer flight time. The fuse went out at the knot and the model flew away—this was found when the model was recovered.

(ii) The fuse must hang in free air. Any attempts we have made to run a fuse through a tube or round a compartment in or under the fuselage have resulted in a high percentage of failures—however well we tried to ventilate the enclosure.

(iii) The fuse must not come into contact with a metal surface. Metal conducts the heat away from the fuse, thus cooling it and tending to put it out. There is an exception to this in that we have successfully used 26 s.w.g. wire guides as in Fig. 2 to carry the fuse well away from the fuselage.

(iv) Dampness. We have not yet had a fuse failure through dampness—and we have used them in rain. In nearly all cases we located the fuse under the fuselage where it is partially protected and take care to keep the fuse dry before fitting to a model. If the fuse *does* get damp it will almost certainly go out.

**Dethermaliser Units.**

The standard Zombie unit is the parachute type—details of which will be clear from Fig. 1. Although shown for a slabsided fuselage it can also be adapted for a streamliner by modification of the box outline.

The release mechanism common to all our fuse dethermalisers is cotton. The cotton holds the D/T. mechanism closed. The fuse burns through the cotton and releases the D/T.

Note that the tension in the rubber strip or band serves to hold the trapdoor shut and, when the fuse has burnt through the cotton, pulls the 'chute out. A further advantage of this is that when the D/T. unit is not required the hook marked " B " can be engaged with hook " A," keeping the trapdoor closed.

With the D/T. operated the 'chute is connected by an elastic line and may lead to the model assuming various attitudes during descent. The modified scheme obviated this, but calls for accuracy in arranging length of guard line so that hooks " A " and " B " will still engage, and also means that a specified length or loop of cotton must be used.

Fig. 3 shows the original standard cotton loop, with the cotton tied to the fuse. Under it is a diagram showing how a failure once occurred with this. The chances of this happening are not very great, but either of the methods shown in Fig. 3 (ii) are better.

**The Parachute.**

We have conducted various experiments with different shapes and sizes of 'chutes, made from different materials. Thin silk is the only entirely satisfactory material we have found, both from the point of view of crease-resisting properties and light weight.

Simple square 'chutes are fairly satisfactory provided that the length of a side does not exceed 12 ins. But the

shape we have found best for small 'chutes is the hexagon. Layout of a standard 'chute suitable for all models up to and including Wakefields is given in Fig. 4.

The thin celluloid (or sheet balsa) spreader is important, both in assisting opening and for ease of sorting out a tangle in the shroud lines. To untangle a 'chute an object such as an orange is dropped in the 'chute and the whole suspended from the retaining line. It is then relatively easy to spot which lines are crossed and treat accordingly.

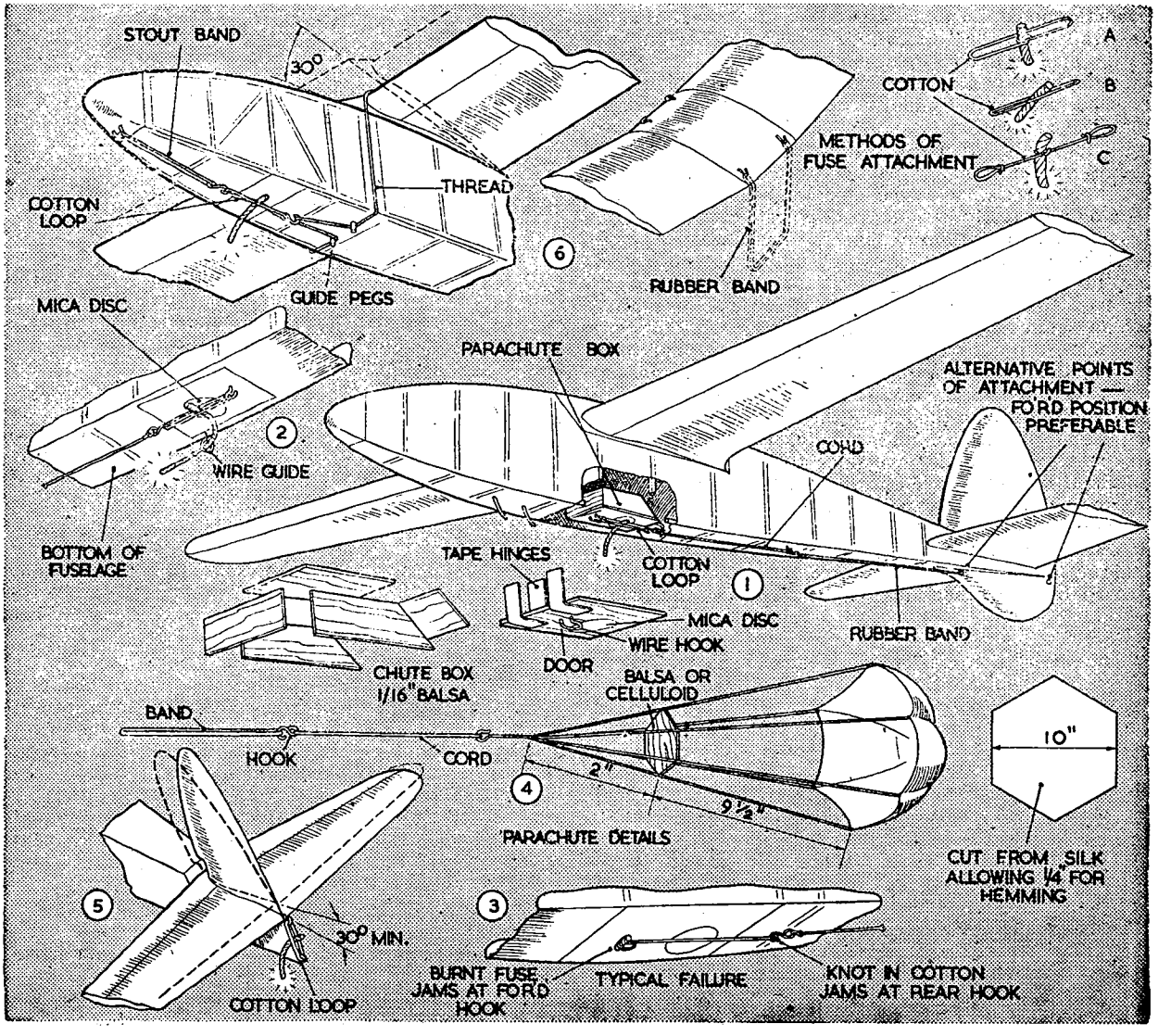
Two other dethermaliser units which have proved successful are illustrated in Figs. 5 and 6. The first is of the Goldberg type, but with a fuse release. The second is of a type which was suggested some years ago, but first appeared in practical form on a model by Taylor, of Bushy Park. The scheme as applied to D. Geddie's lightweight glider is shown.

**Conclusion.**

The fuse offers a simple, cheap and quite reliable form of dethermaliser timer. The weight of such a unit is lower than could be achieved with a pneumatic timer and similar D/T. gear. For rubber-driven contest models, where weight saving is so important, it is hard to beat.

There is, however, a psychological effect associated with the fuse dethermaliser. Each fuse is expendable and must be replaced for each flight. The urge to "chance it" is strong—and more likely than not that will be the flight when the model does strike a thermal. A pneumatic timer has the advantage that, once installed, it only needs pulling back to set each time.

There is also a disadvantage with the use of a fuse dethermaliser on gliders. The person holding the glider has to light the fuse before release and two hands are really needed for this operation alone—one to hold the fuse and the other to press a lighted cigarette against the end. But that is subject for a further article. In the meantime we are producing an electric lighter for fuses—making use of discarded flight batteries from petrol models.



# PETROL VAPOUR

BY C·E·BOWDEN

## HOW TO BUILD A REALLY STRONG PETROL FUSELAGE OF THE SLAB-SIDER TYPE

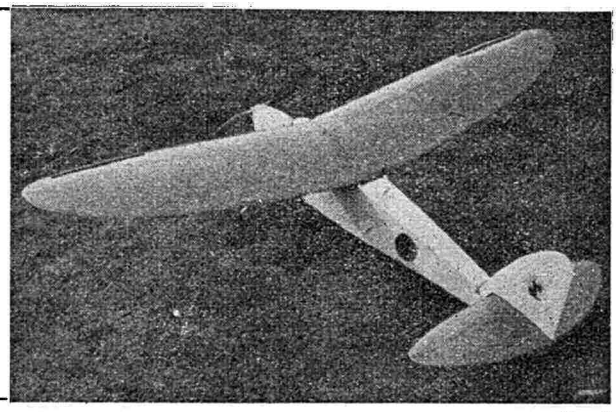


Fig. 6

MANY of my readers will know that some little time ago last year I designed a model called the " Contest " for the beginner, with a rectangular fuselage—I mean the model and not the beginner ! Plans of the model are available in the " AEROMODELLER Plans Service." I used a method of construction in the fuselage that makes building step by step extremely simple and produces a finished fuselage just about three times or more stronger than the conventional rectangular fuselage of longerons, uprights and cross pieces silk covered, or I suppose I should from now on say " nylon covered. " And yet the weight is only a very few ounces more, which is an advantage on a correctly designed and powered petrol model. I evolved this method a number of years ago when I used to go in regularly for setting up petrol records and also in for petrol competitions. Models with fuselages built on this method are still in flying existence after ten and more years' hard work, after crashes, flying into obstacles, drops from trees, and attempts of small boys to poke their fingers through when retrieving the models, one's own involuntary efforts to poke one's own fingers and thumb through the rear of the fuselage during hand-launching operations, and, finally, that fruitful and frequent source of damage done to models by things poking through the covering when the model is in transit in car or public conveyance. Models built like this have set up records and won major petrol competitions because of reliability. As a result, I would not now consider building any rectangular fuselage for a model of over 4 span by any other method, because I loathe repair work.

Since the " Contest " model I have been building a larger model for a kit, with this good old trusty type of construction for the rectangular slab-sided fuselage. In this model I have fitted an experimental diesel engine of *only* 2 *cc.*, which has been flying a 6-*ft.* 3 *in. span elliptical wing with a* 16 *in. chord.* The overall length of the model is 4 ft. 7 in., so you can see how the weight factor does not matter very seriously. Now I have taken a series of photographs of the building of the fuselage step by step, as I can think of no better method for the newcomer to petrol work to make his first freelance fuselage, and I also feel that these photos may also help anyone building the slightly smaller " Bowden Contest " model from the full-sized plans. I am therefore publishing them with this article. Furthermore, the article is designed to help the newcomer. Again, thank you, Mr. Correspondent to the AEROMODELLER.

*Stage* 1. *Fig.* 1.

Trace the side elevation outline of the fuselage on to 1/16 in. sheet balsa. If the sheets are not wide enough glue the edges and butt joint. This will make one large sheet. Cut around the edges with a safety razor blade, being very careful to keep correct angles of incidence where wing and tail platforms will be. (The angles of incidence are the angles at which the wing and tail are set up to the datum or central line around which the whole model is designed.)

Now glue on 3/16 square balsa strips for longerons around the edges of the 1/16 in. sheet outline of the fuselage sides, being careful to glue on the *INSIDES.* See Fig. 1. Use plenty of cement and keep in position until glue dries by ordinary household pins. Glue in the 3/16 square balsa uprights (far fewer are required in this type of fuselage than normal ; one about every 5 ins.). Glue in the celluloid windows. Take away all pins when glue is dry. Keep weights on sides to prevent warping whilst glue is drying. Slightly crack balsa bottom longerons where there are acute curves. Note the three solid main balsa formers, the under fin of laminated balsa sheet and the top rear turtle decking formers shown in Fig. 1 lying beside the two fuselage sides. Where I say " glue," I refer to " balsa cement."

*Stage* 2. *Fig.* 2.

Glue on the three solid balsa main formers, made from either ⅛ in. or 3/16 in. balsa, according to size of the model, to one of the completed fuselage sides. When dry, proceed with Stage 3.

*Stage* 3. *Fig.* 3.

Now glue on the other side. The three solid formers act as a jig and keep the fuselage square. Glue in top and bottom cross-pieces of 3/16 square balsa, also wing platform cross-pieces, and tail solid balsa block. Use pins to retain until glue is dry, and make sure fuselage is kept absolutely square. In my designs I keep the plan curves very gentle, so that the sheet sides do not have to bend unduly and cause distortion when setting up.

*Stage* 4. *Fig.* 4.

We now glue on the bottom sheeting of 1/16 in. sheet balsa, smearing all the longeron bottoms and cross-pieces with plenty of cement.

We then fix any wire hooks, internal wiring of coils, dowels, brass undercarriage tubes, etc. All these highly

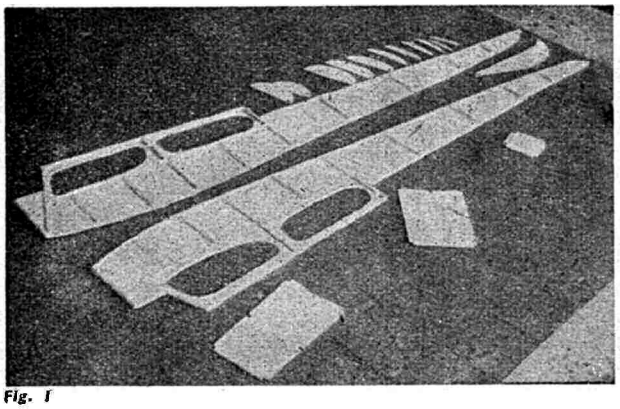


*Fig. 1*

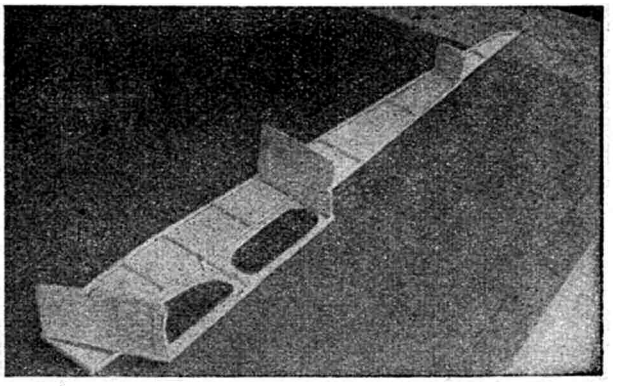


*Fig. 2*

stressed parts are put in with a mixture of plenty of plastic wood and glue smeared well around them with the fingers so that the loads are taken over an area of the sheet balsa around them. This is a secret of a strong fuselage. Glue and plastic wood when dry are immensely strong. Now glue on the half oval formers. In this case the top decking is oval in front of the wing platform and again aft to the tail. In the case of the " Contest " model, the top decking aft of the wing platform is flat sheet curved down to the tail.

*Stage* 5. *Fig.* 5.

The turtle decking is now planked. This is more simple than it sounds to the uninitiated. It will show the novice how he can plank a streamlined monocoque fuselage for the future. Glue and pin on a central plank along the top of the formers. The planks are 1/16 in. and 3/16 in. balsa on 1/16 in. by ¼ in. balsa. Smear the edge of the next plank with cement and pin it in position beside the central plank. Carry on planking like this on either side of the central plank until the whole of the decking is done. The last few planks will require fitting with a razor blade. Use pins until cement is dry. In Fig. 5 the pins can be seen like a hedgehog's back. These are withdrawn and the whole fuselage is sandpapered smooth after the wing platform of 1/16 in. sheet balsa is put on.

On my particular slab-sider models I now fit a rounded carved balsa nosepiece with detachable engine mount. This is fitted to the square nose seen in the photograph, Fig. 5, and can be seen in the photograph of the completed model, Fig. 6. The " Contest " has a nose after this style but with certain differences. However, the nose is not of importance to this article, as it is only the method of constructing the fuselage that matters, so that anyone interested can do likewise and adapt any nose or type of engine mounting that he fancies.

We now add the final act to the fuselage: this is where the real strength is added. Smear the side, etc., with photopaste and cover with silk or nylon, stretching out with the fingers. Before the photopaste is quite dry dope the whole fuselage with one flowing thick coat of full strength full-sized glider dope. Do not work the brush. Just flow on the nose. This dope will form together with the covering and the photopaste knitted in with the balsa sheet a tremendously strong fuselage that will take it under all conditions. If you ever have the unlikely misfortune of something making a hole in the fuselage, all you have to do is to cut around the hole with a razor blade and glue a piece of 1/16 sheet balsa into the hole. Cover with a nylon patch and dope and the repair job is done.

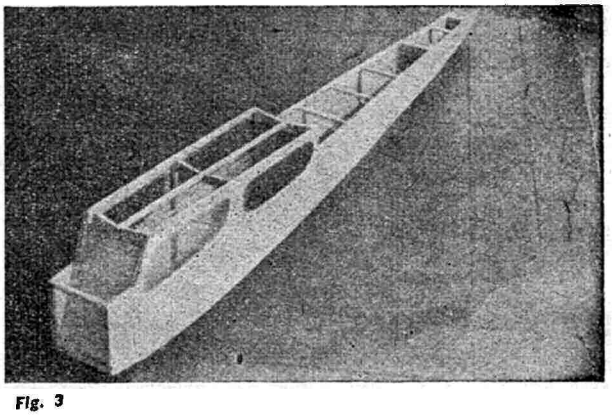


*Fig. 3*

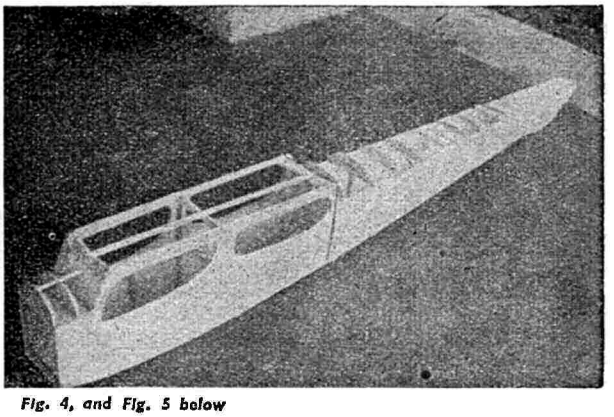
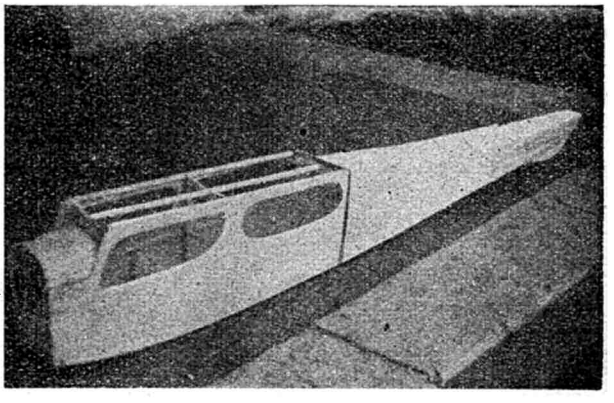


*Fig. 4, and Fig. 5 below*



# MONTHLY MEMORANDA

by

OWEN G. THETFORD


*Photo: G. A. Cull.*

*MODERN TRAINING: First picture to be published showing the Bristol Buckmaster fast conversion trainer in service with Flying Training Command. Only a limited number of Buckmasters was built and production ceased some time ago. Of special interest is the yellow panel on the fuselage, against which the code letters are painted.*

*Photo: Vickers.*

*HIGH FLYER: A rarely photographed Wellington—the Mark V high-altitude version with the pressurised cabin. This hitherto unpublished view was taken early in 1941.*

*Photo: Central Press.*

*GLOBE-TROTTER: The U.S. Navy Lockheed Neptune patrol-bomber "Truculent Turtle" taking off on its world's long-distance record flight of over 11,000 miles.*

*(Below) READ ALL ABOUT IT: The B-29 Superfortress below is used for cosmic ray research. The rest of the caption is written on its nose! Photo: Martin & Kelman.*

### Thunderjet in Production.

It was announced recently that America's latest jet fighter, the Republic P-84 Thunderjet, descendant of the famous wartime Thunderbolt, has been the subject of a production order from the U.S.A.A.F. Over 500 Thunderjets have been ordered, and production at the Farmingdale factory commenced at the end of 1946.

The Thunderjet, with a speed of over 600 m.p.h., ranks as the fastest fighter in the U.S.A. and holds the American speed record of 611 m.p.h. This aircraft will be in the "Aeroplanes Described" feature in the next issue of the AEROMODELLER.

### B.O.A.C. Equipment.

An order has been placed by the Ministry of Supply for 25 Handley Page Hermes IV airliners, for service on the Empire air routes. The first Hermes IV will be in service in 1948. The Hermes IV differs from the original model (similar to the well-known military Hastings) in having an extended fuselage, accommodating 63 passengers under pressurization conditions, and in having a tricycle undercarriage. The Hermes IV will cruise at 271 m.p.h. for an optimum range of 1,400 miles.

An additional order provides for an undisclosed quantity of Hermes V aircraft. Generally similar to the Hermes IV, the Hermes V will mount four Bristol Theseus gas-turbine airscrew units in place of the Hercules. The Hermes V is estimated to cruise at 335 m.p.h. for an optimum range of 1,160 miles.

Further news of B.O.A.C. equipment is that the original order for 79 Avro Tudor II aircraft has been reduced to 50, and that the first Short Solent recently launched will be followed by 11 more.

### New American Bomber Fleet.

Production of the world's largest bomber, the Convair six-motor B-36, commenced at Fort Worth in December. It is reported that about 100 of these aircraft are on order for the U.S.A.A.F. and will presumably form the backbone of any projected "atomic-bomb force." The prototype XB-36 made its first flight on 8th August, 1946, and has since been undergoing intensive development. The production model will have an eight-wheel landing gear, arranged in two 4-wheel trucks, in place of

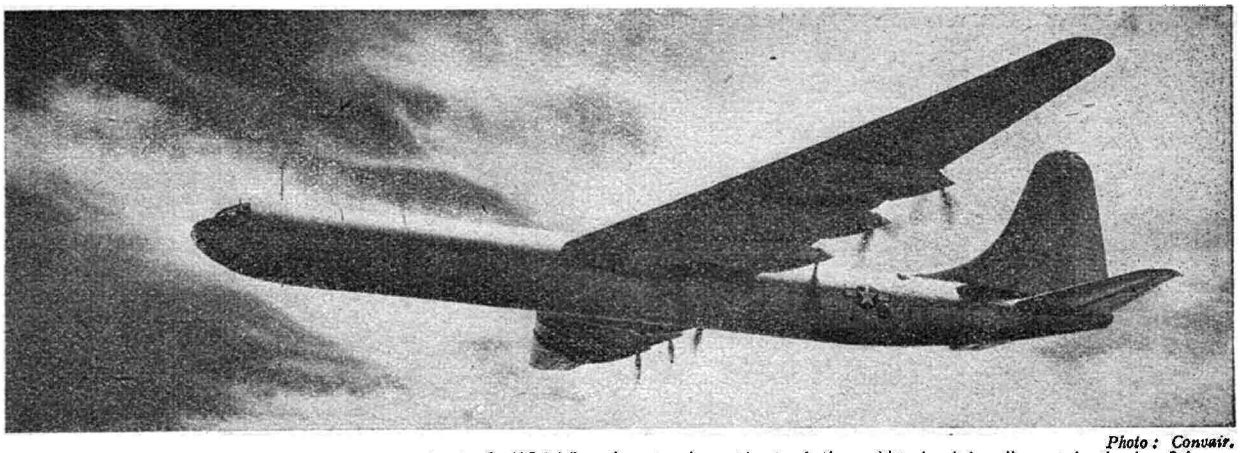


*Photo: Convair.*

*BIG, ISN'T IT? The Convair B-36 is the latest bomber for U.S.A.A.F. equipment. Largest bomber in the world to-day, it is well over twice the size of the Forts and Libs. of wartime fame.*

the two large wheels on the experimental model.

The B-36, successor of the B-24's of wartime fame, is powered by six twenty-eight cylinder four-row air-cooled radial motors, each with two superchargers. Pusher propellers of the three-blade reversible pitch type are of 19 ft. diameter. Span of the B-36 is 230 ft., length 163 ft., loaded weight 278,000 lb. and maximum speed over 300 m.p.h. With a load of 10,000 lb. of bombs, the B-36 has a range of 10,000 miles.

### B.E.A.C. Fleet.

Total number of Vikings delivered to British European Airways by February 29th next is to be 44. These aircraft will replace Dakotas and will be supplemented by 25 Miles Marathon twin-jet feeder-line transports. The jet-propelled Marathons will be powered by two Armstrong Siddeley Mamba jet engines and first deliveries are expected by the end of 1947.

### Constitutional.

Chosen from a field of 28 designs, the U.S. Navy's first Lockheed XR-60 Constitution transport made its maiden flight on November 11 last, and the second is now undergoing tests. Production of about 75 Constitutions for the Navy will commence at the end of 1947. Powered by four 3,000 h.p. Pratt and Whitney TSB1-G 28-cylinder Wasp Major radials, the Constitution has a span of 189 ft., a length of 156 ft., a loaded weight of 184,000 lb. and a maximum speed of 303 m.p.h. at 20,000 ft. A maximum range of 6,300 miles is obtained at a cruising speed of 238 m.p.h.

### No. 104 Squadron.

I am indebted to several readers for information concerning the Wellington II illustrated in these columns in the Xmas number. This particular aircraft, bearing the code letters "EP," belonged to No. 104 (B) Squadron, which flew Wellingtons in the Middle East and Italy with No. 205 Group, alongside Wellingtons of No. 40 (B) Squadron, coded "BL."

No. 104 Squadron's Wellingtons were later superseded by Liberators, but ultimately No. 205 Group re-equipped throughout with the Lancaster VII (Far Eastern version) and moved to the Suez Canal zone.

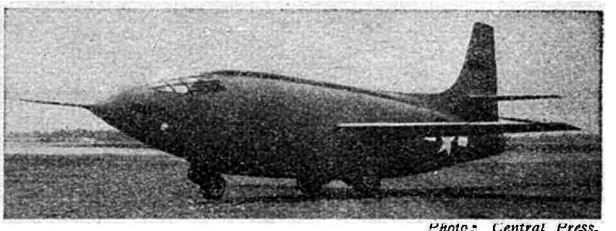


*Photo: Central Press.*

*OLD NEEDLENOSE: The experimental Bell XS-1 rocket-propelled aircraft, with which the Americans hope to crack the sonic barrier. Span is 28 ft. and estimated speed 1,700 m.p.h. at 80,000 ft.*

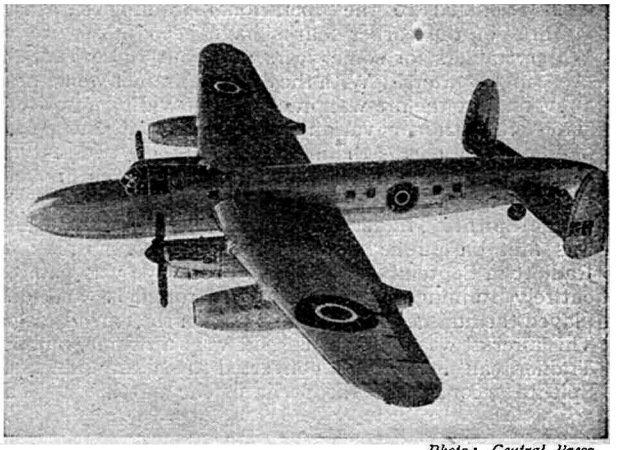


*Photo: Central Press.*

*ACHIEVEMENT: The Nene-Lancastrian semi-jet transport is the most advanced aircraft in its category anywhere in the world. The logical advance to four jets is probably not far ahead.*

*LOCKHEED'S LATEST: 189 ft.-span Lockheed Constitution is the world's largest transport aircraft and is to be built in numbers for the U.S. Navy.*

*Photo: Central Press.*

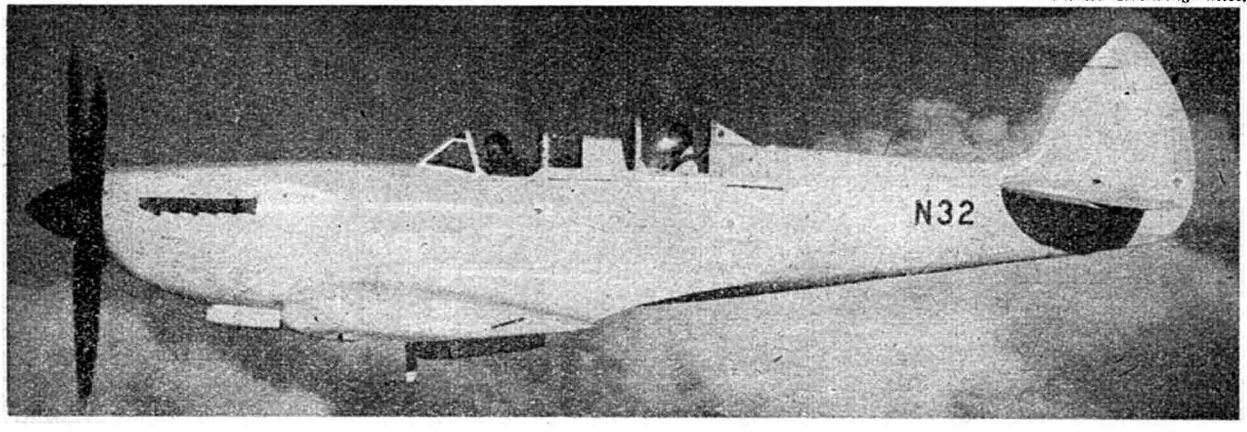

SUCH is the rate of progress in military aeronautics that only two or three years after the pinnacle of its glory as a first-line type the single-seat fighter finds itself relegated to the operational training category. Spitfires of the earlier Marks have been in service as fighter trainers for some years now, but these have all been single-seaters. With the Spitfire Trainer we witness a reversion to the pre-war practice of providing a two-seat conversion trainer variant of the current single-seat fighter. One recalls the Siskin and Bulldog two-seaters. Of the monoplane fighters, the Hurricane, Spitfire and Firefly have been converted.

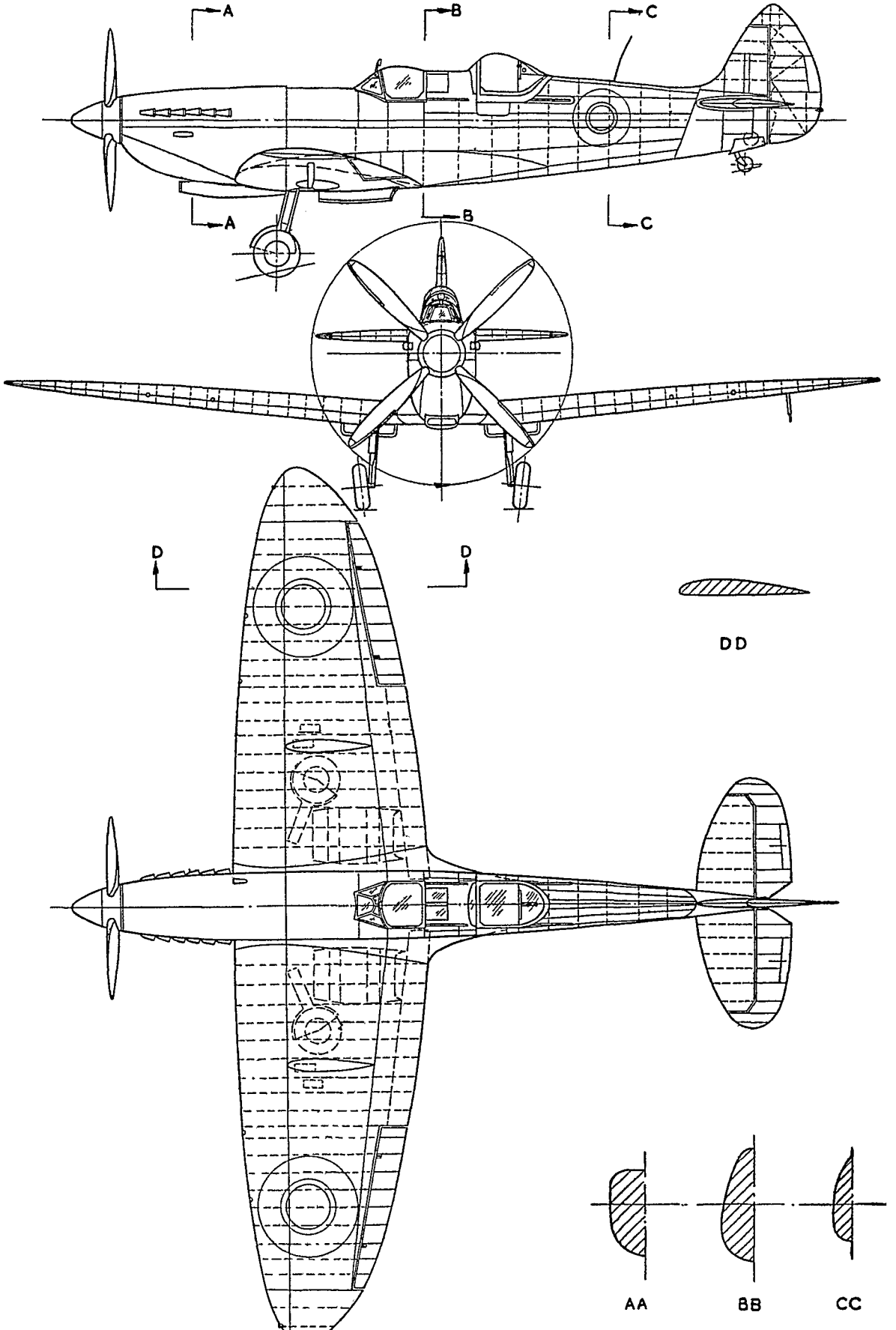
The Spitfire Trainer was developed during 1946 and was first on public view at the S.B.A.C. Display at Radlett in September last. The prototype was painted entirely training yellow; bore no roundels, and displayed the number " N 32 " in black on the rear fuselage. This aircraft was a converted Mk. VIII airframe, but the Trainer can in fact be converted from any Mark of Spitfire according to the needs of the purchaser. The rear, raised cockpit, which accommodates the instructor, duplicates the instruments and controls in the front cockpit. Both hoods can be jettisoned in an emergency. In the Trainer the cannon-bay is deleted to permit the installation of extra fuel tanks, there being four tanks in the wings in addition to the normal fuselage tank and an optional drop tank. A variety of armament installations are possible according to the Mark of Spitfire converted, making the type useful for all aspects of gunnery and bombing training.

The two-seat Spitfire retains a high performance and the converted Spitfire VIII with a Rolls Royce Merlin 66 motor has a top speed of 390 m.p.h. at 20,000 ft. The stalling speed is 80 m.p.h. and the wing loading 30·6 lb./sq. ft. The maximum flying weight is 7,400 lb. and the service ceiling 42,000 ft.

At the time of writing there is no announcement regarding the future production programme for the Spitfire Trainer but it is more than likely that contracts will be received from overseas.

*Vickers Armstrong Photos.*



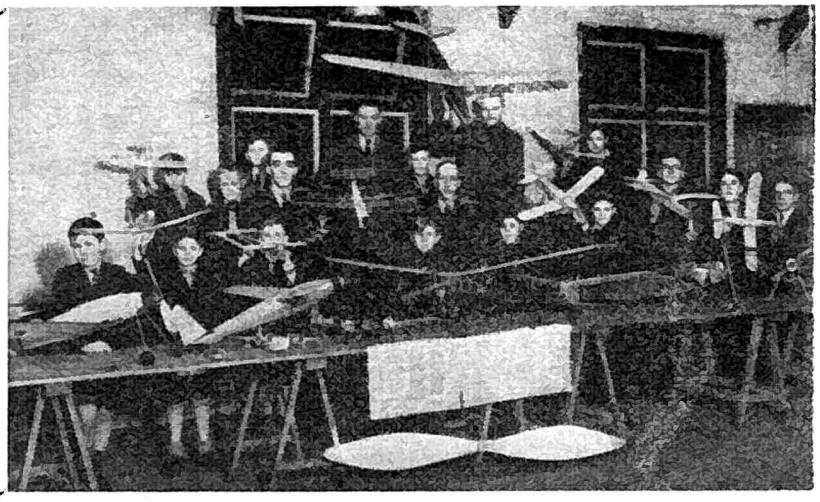



VICKERS - ARMSTRONGS SPITFIRE TRAINER

FT

# CLUB NEWS

BY CLUBMAN



*The Doncaster and District Model Aircraft Club complete with an outsize in props. We wonder what the model is like that this is going to power.*

THOUGH this is the February issue, it will be the first number you will read in this new year of 1947, and it is my heartiest wish that all my readers find this new season the best yet, with plenty of fine weather, manageable thermals, and may all those new models turn out winners and record breakers without first breaking their owner's hearts! In fact, all you wish yourselves for 1947, and good flying.

My remarks last month on the subject of the Wakefield Cup contest have brought a number of letters from readers, many agreeing with my proposal for an elimination of sorts, and some expressing a desire for the old free-for-all. It is noticeable that the latter are all enthusiasts who have yet to compete in a Wakefield Trials, whilst the other side of the fence is peopled with nearly all the earlier participants in this very important fixture. Illuminating, eh!!

The current issue of the American A.M.A. (Academy of Model Aeronautics) journal "Model Aviation" carries some interesting comment on this International competition subject. Quoting from the paper we learn that "*at the request of the Chairman of the International Moffett Contest Committee, and in conformance with a majority of opinion expressed during the A.M.A. meetings in Wichita, the International Moffett Meet will be discontinued as a part of the official activities of the Academy and national meets. The Chairman pointed out that the Moffett was always a poor substitute for the Wakefield type of flying, and that instead of dividing interest, all should concentrate on building up activity in the Wakefield type of model.*" (For newcomers to this hobby of aeromodelling, I would say that the Moffett Contest was an event staged in America on somewhat similar lines to the Wakefield Cup, open to teams from all countries, but always taking place in the States.)

The same issue gives news that Al. Lewis, for many years secretary to the A.M.A., has left to take up a position in the model industry, his A.M.A. duties being carried on by "Russ" Nichols. Incidentally, Lewis is the newly-appointed American member of the F.A.I. model commission which will, we trust, meet regularly to thrash out the always recurring technical snags, alterations, etc., etc.

Great keenness is being shown in the Singapore area, probably as a result of the availability of a number of R.A.F. chaps there nowadays. Recently R.A.F. Seletar beat their opponents, the Singapore Aeromodellers Club, by averaging 2 : 08 to 1 : 08. Many A.P.S. models were well in evidence, high spot of the meeting being a flight of over 20 minutes with a "Dusty" flown by L.A.C. Gillott during a test flight. Kendall's "Mick Farthing" clocked 5 : 11 in the contest. L. Buxton put up 1 : 41 as the best flight for the losers. (It is strange to read that the meeting was curtailed by a deluge of rain! How like England that sounds.)

A spicy news sheet has made its appearance from the S.M.A.E. LONDON AREA. Congratulations are due to Press Sec. Buxton of St. Albans—would that other areas were as publicity conscious, and not content to hide their light under the disused Anderson. A change around in official positions puts Cosh in the Chair, with a number of well tried stalwarts on the Committee, and it is hoped to make the London Area more live than in the past.

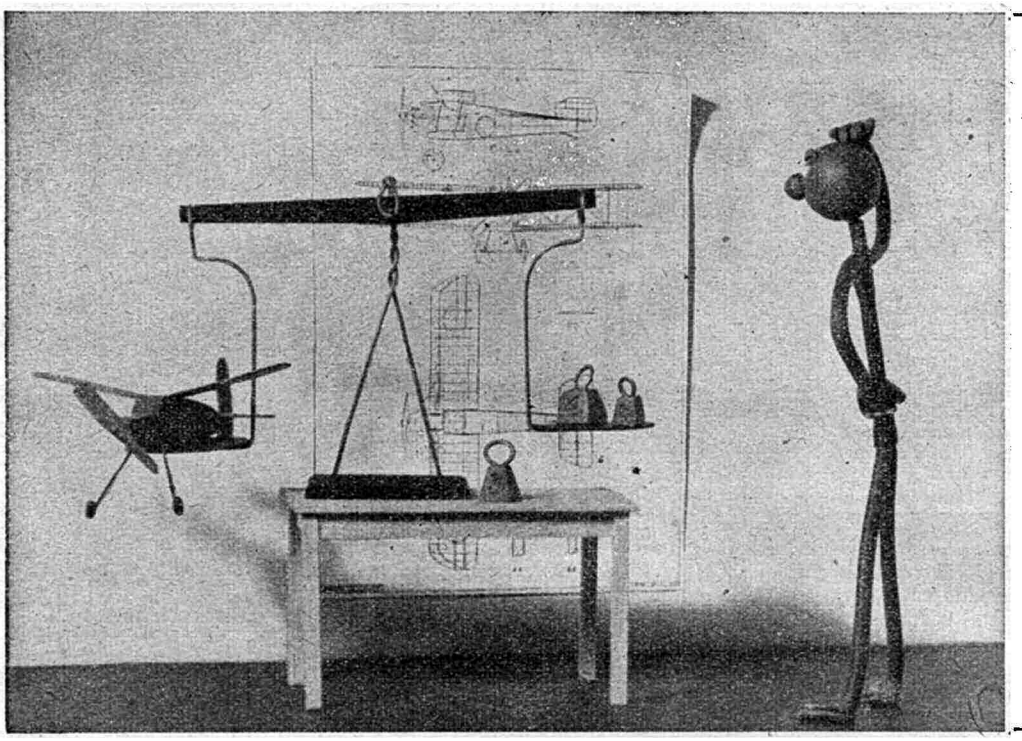
Amalgamations of groups of clubs into "councils," "guilds," etc., seem to be the order of the day, and I trust this move will not be allowed to act to the detriment of a full-scale Area system. The latest group is the HUMBERSIDE GUILD OF AEROMODELLERS, comprising the Beverley, Hull & District, Kingston-upon-Hull, and Brough Welfare Clubs. A general programme has been arranged for the 1947 season, culminating in a Rally to take place on August 4th.

To cope with rapid expansionist activities, the former West Coventry M.A.C. has altered its title to WEST MIDLAND M.A.C. The Coventry Branch has its winter programme running smoothly, and recently held a speed competition, won by R. Ellis, with a speed over five laps of 22·2 m.p.h. Branches are in operation at Kenilworth and Nuneaton.

The initial indoor flying meeting of the LOUGHBOROUGH COLLEGE M.F.C. resulted in club records being established for Class A, 1 : 11·6 by P. J. Cannell, Class B 0 : 36 by C. Aitkenhead, and a speed of 21 m.p.h. also by Aitkenhead.

R.T.P. activity has also been seen with the EAST LIVERPOOL M.A.C., who lost a match with the Wallasey club. Best Wallasey time was 1 : 04·8 by Brody, the best Liverpool time being 41 seconds by Monk. Dodds has been testing an excellently built Tempest round the pole—not a bad way of trying out these tricky scale types prior to outdoor attempts.

Another club to change title is the Waltham & Enfield M.A.C., now to be known as the ENFIELD & D.M.A.C. (Many curses from my records keeping clerk!) Indoor models are appearing, despite one or two tough types



Having heard a model expert saying

"The secret of success is weighing,"

Our little Ben is in deepest thought

—His model's twice as heavy as it ought.

who still brave the great outdoors. Most of the free flying indoor jobs are of the tail-first pusher types. These little models possess amazing stability, which makes them ideally suited to the drafty conditions which prevail in the hall.

In spite of poor weather during November, many members of the KINGSBURY M.F.C. recorded o.o.s. flights, most outstanding of which was D. Deer's 8 : 42 with his 60 in. span glider. This was the model's second flight, and has not been recovered. R. Jamieson also turned in two excellent flights around the 5 minute mark with his 50 in. glider, the model being returned on each occasion. Both models are lightweights, with slab-sided " hump-back " fuselages, and polyhedral even chord wings with elliptical tips.

The NON-COMS M.A.C. are fortunate in having the use of Cardington Aerodrome, and some fine meetings were held there during 1946. A number of successes were gained in outside meetings, notably at Eaton Bray, which is in fairly easy reach for these chaps. (I have " tender " memories of Cardington, having been roped into and finally demobbed from the R.A.F. there.)

A few " Daffinitions " from the BUSHY PARK M.F.C. news sheet might give you a chuckle, so here goes :—

" Thermals "—are usually found on the last test flight before the competition. Stop watches and thermals are never found together.

" Tailless Models "—produced after much research as to the most unstable type of model that can conveniently be built.

" Wakefield "—a large, usually underpowered model that most people are going to build " next year " but never do.

" Streamlining "—a useful method for bringing a model up to F.A.I. weight.

R.T.P. flying is in full swing with the DONCASTER & D.M.F.C. boys, and M. A. Hetherington has pushed the club record up a little further to 3 : 34 with his latest model. Speed flying is also receiving more attention this year, and some quite unorthodox models have appeared ! Hetherington is hoping to break the outdoor British speed record early this year with a successful model he has been flying.

The indoor flying challenge meetings staged by the MERSEYSIDE COUNCIL OF M.A.C.'S is going well, the leading clubs to date being St. Helens and Aintree. Best individual flights to date are by R. Scott of St. Helens, clocking 2 minutes with his " A " class model, and 1 : 33 with the " B " job.

The BOLTON M.A.S. is now well on its way after its wartime closure, and a permanent clubroom and flying field have been found. An exhibition will be staged in February in an effort to increase membership. Indoor flying is in full swing, A. Bailey (Senior) holding the record at present with a time of 1 : 49·6.

Bob Minney of the LUTON & D.M.A.S. had a real collection to cart home from the club Reunion Dinner and Social. His bag of five cups and nine certificates included the Championship Trophy, and a glance at the classes competed in shows his excellence in all-round aeromodelling. R. Brown, R. Hinks and C. Houghton were other cup winners.

The FARNWORTH (Lancs.) M.E. now have no field, but to compensate in part for this have a permanent clubroom complete with heating, furniture, etc. I am told that some members are " nerts " on tailless jobs, some " nerts " on duration stuff, and the rest just plain " nerts." 'Twas ever thus ! Records to date are: Sailplane 9 : 50 by D. Nuttall ; H.L. 3 : 50, Tailless 2 : 34 and F.A.I. 4 : 15 all by C. M. Holden.

A very interesting news sheet put out by the NORTH KENT M.A.S. gives some informative " gen " about the club from its earliest days, and I welcome back to the fold friend Newport, responsible for this publication. This club were privileged to witness a preview of the new

film on model aircraft (mentioned last month), the occasion being the annual prizegiving. The contest for the London Area r.t.p. first round was a walk-over, owing to the opponents, Zombies, withdrawing. The N.K. times were good, J. Knight clocking 2 : 52 and 3 : 03·5, whilst A. D. Hall did 2 : 22·2 and 2 : 40.

BRISTOL & WEST M.A.C. have also been indulging, flying anything from Wakefields down! R. A. Foster created a new club record for Class B with a flight of 2 : 30 with an interesting triangular fuselage, parasol wing model with no fin. A. H. Lee dug out his former British record holder of 1938 vintage, still with the original microfilm, and soon got it going in grand style. The Aces section staged an exhibition supported by the B & West, which proved a fine show, best model being Ken Sergeant's Bowden Contest, modified for control line flying.

A worthwhile idea started by the SALE AERO CLUB is the inclusion of a blue print of successful club models with each issue of the club magazine "Saleplanes."

A well-supported solids competition held by the SOUTH EAST BIRMINGHAM M.A.C. was won by J. Sawyer's excellent model of a Hurricane IIC. To 1/36th scale, this model has controls and flaps working from the cockpit, and a fully detailed dummy motor beneath the removable cowling, and a tiny electric motor to revolve the airscrew. R.T.P. scale models have found favour, a contest for this type being won by T. J. Patrick's Miles M-48 with an aggregate time of 58 seconds.

Northern Heights gave the CHINGFORD M.F.C. a walloping in their round for the London Area r.t.p. contest, totalling 724·5 points to 129·5. Copland clocked 3 : 25 and 3 : 20, with White adding 2 : 33·5 and 2 : 46. Chingford's best time was 56 seconds by P. Russell, but they all had a good time, and that's the main thing.

Readers of the French magazine "Decollage" would like to correspond with modellers over here, so if anyone would care to write, address your letters to M. Henri Jones, Redaction-Administration : 4 bis, rue du Bouloi, Paris I.

A number of chaps wish to get clubs going in their districts, and as usual I give their names and addresses, leaving those interested to contact them in due course. They are : W. Tinker, "Holmley," Eastcroft Road, West Ewell, near Epsom, Surrey ; V. Barratt, 1, Field Road, Ilkeston, Derbyshire ; F. J. Freeman, 1, Holdsworth Street, Wyke, Bradford, Yorkshire ; D. Turkington, 15, Belville Street, Greenock, Scotland ; J. W. Robertson, 76, Hatherleigh Road, Ruislip Manor, Middlesex ; and W. Billingdon, 36, Langley Lane, Middleton, Manchester.

And that, my little balsa bashers, is the lot for this month, and may your eyes never lose sight of that flyaway model, and your legs hold out throughout the new season. Again, my very best wishes for 1947, and let's hope it's a bumper year in every way.

THE CLUBMAN.


**"THAT MAN IN THE FLAT BELOW HAS BUILT ANOTHER HELICOPTER!"**

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R. J. Burley, Parker's Hotel, Cliff Parade, Hunstanton.
BUCKSBURN A.C.
C. M. Christie, 152, Mugiemoss Road, Bucksburn, Aberdeenshire.
BLAYDON M.A.C.
H. F. Worsnop, Greenwell House, Blaydon-on-Tyne, Co. Durham.
KNARESBOROUGH & D.M.C.
E. Page, 8, Bond End, Knaresborough, Yorkshire.

SECRETARIAL CHANGES

DUMFRIES M.F.C.
J. Steel, "Nancyville," Annan Road, Dumfries.
RUISLIP & NORTHWOOD M.A.C.
F. R. Wyatt, The Haven, Brakespeare Road, Ruislip, Middlesex.
EASTLEIGH & D.M.C.
S. Ward, 26, Blenheim Road, Eastleigh, Hants.
ABERDOVEY M.F.C.
H. Jones, "Moylona House," New Street, Aberdovey, Merionethshire.
FARNWORTH A.M.E.
C. M. Holden, 2, Lavender Road, Farnworth, Nr. Bolton, Lancashire.

**REGULAR FEATURES**

**Readers will notice the absence of two of our regular features this month. E. J. Riding's Civil Aircraft Series is absent owing to the author's pressing duties at the 3rd National Exhibition, and will be resumed next month, as will "Aircraft in Miniature," our popular "Solids" Series by W. O. Doylend.**

## CLASSIFIED ADVERTISEMENTS

**PRESS DATE for April issue—March 1st.**
**ADVERTISEMENT RATES;**
***Private*** **Minimum 18 words 6s., and 4d. per word for each subsequent word.**
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**Box numbers are permissible—to count as 6 words when costing the advertisement.**
**COPY should be sent to the Classified Advertisement Dept. the "Aeromodeller," The Aerodrome, Billington Road, Stanbridge, Beds.**

### FOR DISPOSAL

AEROMODELLERS. July, 1943–December, 1946. Several books, plans, all perfect. 30s.—Carl, 137, Summerfield Road, Solihull, Birmingham.

Volumes IV and V "A.F.P." Good condition, £2.—J. Richmond, 151, Bushbury Road, Fallings Park, Wolverhampton.

Vol. I, II, III, IV "A.F.P." As new, £4.—J. Bickley, 184, Alma Avenue, Hornchurch, Essex.

French Diesel 1·8 c.c. timer, ¼ pt. fuel, 9 in. prop and ¼ scale drawings of Tiger Moth suitable for above. All brand new. £7.—J. R. Allanach, 99, Cross Flatts Ave., Leeds 11.

Complete Trix electric train set, for sale or exchange for petrol or diesel plane. Offers.—Davis, 24, Bedwell Road, Tottenham, N.17.

Owat 5 c.c. diesel engine and propeller. Not used. £9.—Wooldridge, 16, Torch Road, London, N.W.2.

"Junior 60" 5 ft. span petrol kit, complete airwheels, ready cut ribs, etc. £3. 10s. (cost £3. 17s. 6d.) Partly made 4 ft. span petrol model cut ribs, etc., with rest of kit—£4.—J. Ralph, Clanna Cottage, Alvington, Lydney, Glos.

Seagull Mk. I twin motor rubber-driven flying boat, 38 in. span. £3.—G. Ahara, 230, Gladsmuir Road, Glasgow, S.W.2.



Bowden Contest petrol model for sale, complete with airwheels, less engine part finished, also 75 copies of the "Aeroplane." £4. 10s. the lot.—Apply M. A. Godden, 49, Challis Lane, Braintree, Essex.

"A.F.P." Vol. 1, "Red Air Force," "Hurricane," "Book of Spitfire." Lot 30s.—Moss, "Smallheath," Bull Lane, Rayleigh, Essex.

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AEROMODELLERS, Dec. 1943–June, 1944, without covers, 4d. each. Jan. 1945–Dec. 1946, 8d. each with covers.—Goodwin, 17, Kersland Street. Glasgow, W.2.

3.5 c.c. Atlas petrol engine, bench tested only, complete with coil, condenser, tank, plug, prop, test mounting. £7 10s.—Elbourn, Orchard House, Melbourn, Royston, Herts.

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Aeromodeller disposing stock. S.A.E. for list. Also ready built 1/72 Frog Barracuda and Mosquito. 20s. the two.—D. Beattie, Bossknowe Cottage, Canonbie, Dumfrieshire.

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AEROMODELLERS, "Spotters," "A.F.P.s" numerous books, magazines on aircraft, for "Model Engineers," books, magazines on sailing ships, ship modelling.—Box No. 48.

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AEROMODELLER, back numbers can be obtained from—W. H. Forway, Elizabeth Villa, Coventry Corner, Hockley, Essex. Early copies bought.

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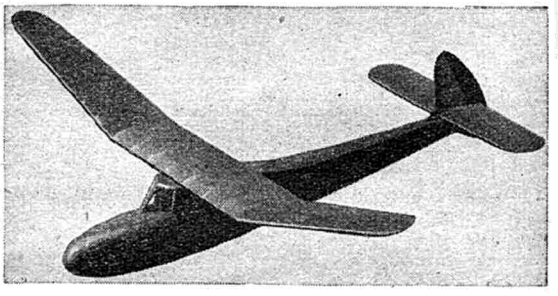

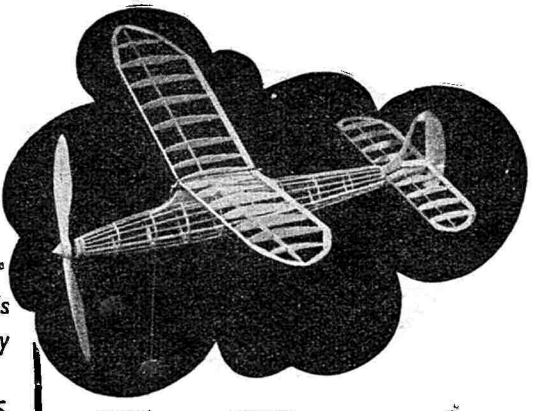

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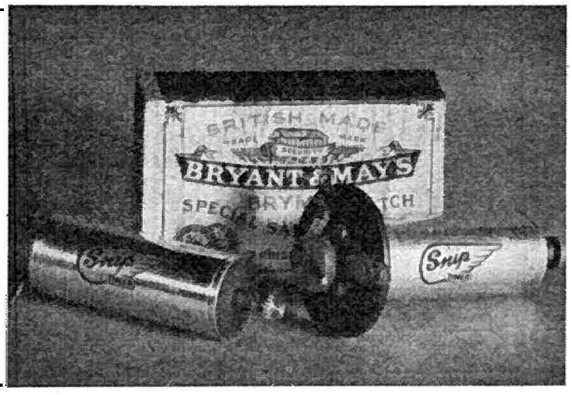

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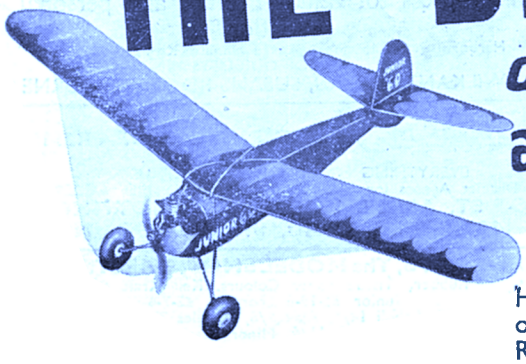

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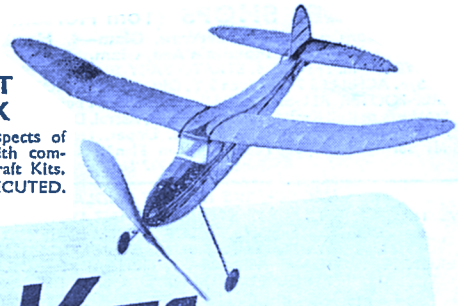

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