AERO MODELLER

MARCH, 1940
VOL. 5 No. 52

PLANS FOR BUILDING A SOLID SCALE MODEL OF THE HANDLEY-PAGE "HAMPDEN" BOMBER. SPAN: 8 5/8" SCALE: 1/96th.

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IN THIS ISSUE

7D

MORE ABOUT PETROL DRIVEN FLYING BOATS

BY Dr J. F. P. FORSTER

RHODESIAN RECORD BROKEN

THE RHODESIAN HERALD, January 9th, 1940

RHODESIAN MODEL PLANE FLIGHT RECORD

MACHINE IN AIR FOR OVER NINE MINUTES

What is believed to be a Rhodesian record for rubber-powered model aeroplanes was set up on Saturday by Mr. F. C. Sandford's "Cloud Zenith" in a "rise off the ground" endurance competition held by the Model Aeroplane Club of Mashonaland.

The model, after flying for 9 min. 30 sec., was lost to sight in the clouds at an altitude of 2,000 ft.

As the official timekeepers, competition secretary and treasurer were present, and the flight was timed with a stop watch, it is claimed that the flight is a Rhodesian record. It is understood that the previous best flight in Rhodesia was five minutes.

1940 CATALOGUE 60 PAGES 15-PAGE ARTICLE BY Mr. HOWARD BOYS 3d. post free

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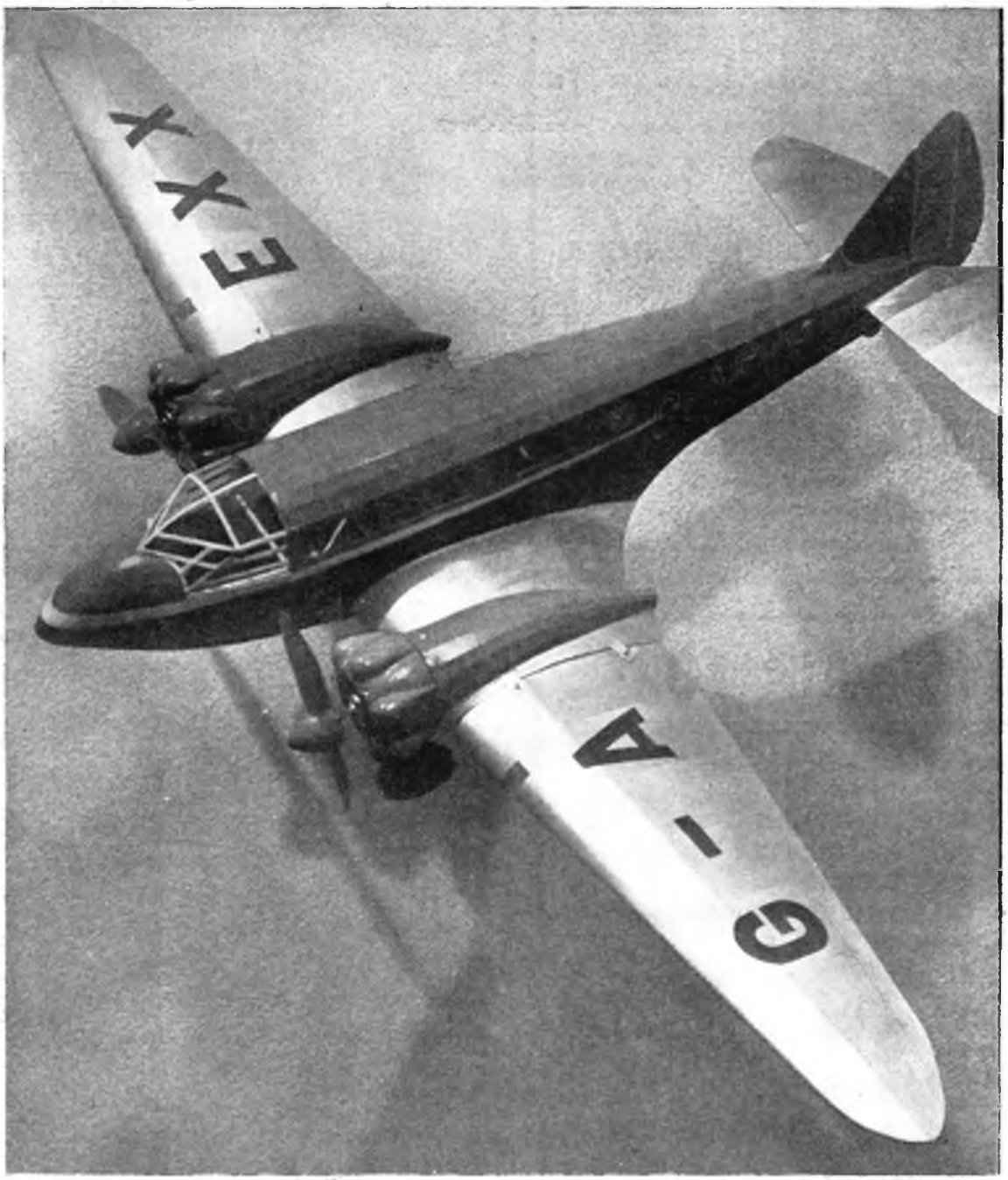
THE AIRSPEED ENVOY—AGAIN!



This beautiful-looking model was built by Mr. Charles Barnett, of Seven Kings. It is, of course, a 54 in. span flying scale model to the original design by Mr. J. H. Towner.

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Tel. Leicester 65322

The AERO MODELLER

INCORPORATING THE "MODEL AEROPLANE CONSTRUCTOR"

EDITORIAL

HE invitation issued in our last Editorial to readers, to send us a list of " likes and dislikes, has brought quite a number of interesting replies, but we should like some more, so as to make our survey as comprehensive as possible. One or two points we can deal with right away, since the opinions recorded are unanimous. Gadget Review has come to stay. Also Mr. Pollitt's plans are well liked . . . provided he leaves out his shading lines! Job's adventures are also well received, and a further series of his adventures will be published throughout the year. Now and again we shall have a story by another author, to add a little variety. We have one such this month—" Indoor Antics " combines a personal experience with some valuable information on the building and flying of microfilm models, served up in a humorous way by Mr. C. S. Rushbrooke in the style peculiar to himself. We trust that this story will be read with enjoyment.

The Nazi Swastika

Oh yes . . . and we have to thank those several readers who sent us postcards pointing out that the swastika on the fin of the Messerschmitt 'plane on our last month's front cover was drawn with the arms facing the wrong way! We plead guilty. But at least there are others, and perhaps the mention of this point will impress on the minds of all those aero-modellers who are interested in German aircraft that the arms of the Swastika point in a clockwise direction!

A " Swaps " Page?

We publish an interesting letter this month from a reader who suggests that we start a " swaps " page. What do readers think of this? We are quite ready to run such a feature if it would be of use, but we should have to make a small charge for this service. To try out the idea, we will undertake to publish in our next issue a list of " readers' swaps " to be negotiated for terms as outlined in our correspondent's letter published on page 205. Each reader's " swaps " must be limited to 24 words, and a nominal charge of 1s., together with a stamped addressed envelope, must be sent by each reader.

The National Guild of Aero-modellists

We have been quite inundated with renewal forms from members of the National Guild of Aero-Modellists, and this will explain why members did not receive their cards per return. Sometimes we had received several hundred forms in one day. However, all members should have received their 1940 membership cards and transfers by the time this issue is on sale. Many members have ordered lapel badges, and these should have all been delivered by the end of February. On page 228 we publish some notes by Mr. Dudley Ship, and a set of instructions for the benefit of those readers who have yet to complete their membership forms. Whilst the form is called a *renewal* form, it can, of course, be used by those readers who are new to THE AERO-MODELLER and have not before availed themselves of this fine third-party insurance scheme. Some interesting information regarding the claims which were paid out on last year are also given. Full terms of the policy are printed on the back inside cover page, whilst the membership form is printed on the reverse side of the blue print given free with this issue.

A Special Wakefield Number

Our next issue will be a special Wakefield Number . . . we boast that it is going to be one of our best issues. The cover will have a really fine colour painting by artist W. J. Shaw, of Bob Copland's 1940 Wakefield model. We have secured the copyright of the full-sized plans and building instructions of this model, and these latter and full particulars for obtaining the plan will also be published. Then we shall have an article by Mr. R. N. Bullock on the design of Wakefield models, which will be illustrated by the author's own sketches. There will, of course, be Gadget Review by Mr. Pollitt, and the second of our new series of articles on solid models by Mr. J. H. Elwell. Given away with this issue will also be full-sized plans and building instructions for an easy-to-build duration model, especially designed by Mr. C. A. Rippon for members of the Air Defence Cadet Corps. The designer's idea has been to produce an attractive yet simple duration type of model which members of Air Cadets could build, and form teams for competition, between their squadrons.

A Wakefield Survey

In our April issue of last year we published a survey by Mr. Arnold Watthew entitled " The Trend of Design of Wakefield Models." This survey was developed by Mr. Watthew from such information as he himself was able to obtain, and whilst this was quite representative, it naturally could not be as comprehensive as Mr. Matthew's 1940 survey *can* be, if readers will co-operate and assist him. On page 217 we print a message from Mr. Watthew explaining what he wants builders of Wakefield models to do. On the reverse side of our blue print is a " questionnaire form," to be filled in by all those who are ready to assist. Study of this form will show that Mr. Watthew is going to give himself a great deal of work in sorting out the answers from all the forms! Much more, in fact, than will be involved in filling *in* the forms. Will as many readers as possible please fill in the particulars asked for and let us have the completed forms, addressed to Mr. Watthew, c/o THE AERO-MODELLER, Allen House, Newarke Street, Leicester, to reach us as quickly as possible. As we are going to publish the result of this survey in our next issue, it is essential that readers co-operate and dispatch their forms to reach us by March 3rd at the very latest. With the Wakefield survey, plans of the Air Cadets model, full particulars of Bob Copland's model, the article by Mr. Bullock and several other special features, we are confident that this will be a first-class issue, so advise all readers to make sure of their copy by seeing that they have placed an order for it with their local newsagent.

Our plan of the Supermarine "Spitfire"

With our Christmas issue we presented plans of the Supermarine " Spitfire," and offered a prize of 10s. 6d. for the best-looking photograph of a model built from the plans. The accompanying photograph shows the model built by Mr. Jordan, of South Woodford, London, to whom we have awarded the prize. Mr. Jordan reports that he has had a number of successful flights from his model. This month we give away with each issue a blue print for a solid scale model of the Handley-Page " Hampden," and again we offer a prize of 10s. 6d. for the photograph of the best-looking model built by a reader. Photographs (which cannot be returned) must be posted so as to reach our Leicester office not later than first post, March 31st next.

Petrol Plane Topics

We draw attention to an article by Dr. Forster on pages 184-6, in which he describes his experiences with a petrol-driven flying-boat. We feel that Mr. Burgoyne, who took the photographs illustrating Dr. Forster's article, is to be congratulated on obtaining such a fine sequence. In a later issue we shall publish a further article by Dr. Forster, fully illustrating and describing in detail the construction of some of his flying-boats; meanwhile we are pleased to announce the introduction of another new feature, " Petrol 'Plane Topics," to be conducted each month by the Doctor. The first of these articles will be published in our next issue, and readers are invited to send short particulars, accompanied by photographs, of their petrol 'planes. Dr. Forster will also deal, in a general way, with interesting queries raised by petrol 'plane enthusiasts. Correspondence should be addressed to Mr. Forster, c/o THE AERO-MODELLER. Dr. Forster will *not* deal with queries other than through his series of articles.

Aero-Modelling and the L.C.C.

We hear from Mr. C. T. Bird; head of the L.C.C. Islington Men's Evening Institute, Robert Blair School, Blundell Street, Holloway, N.7, that he has formed the Islington Men's L.C.C. Evening Institute Model Aeroplane Club. Membership is already over 30.

Mr. Bird, who is himself a keen aero-modeller, offers a hearty welcome to all men, and others, in the Holloway area, either as newcomers to his club or those who may be members of local clubs, which, owing to the war, have suspended active operations.

Mr. Bird has secured the services of Mr. M. R. Knight as instructor-lecturer, and meetings are held every Wednesday under his guidance. Meetings are held just like any other clubs, models are made, talks and lectures are given. The subscription is 1s. 3d. per term of 13 weeks, and material may be bought from the L.C.C. Mr. Bird concludes his letter by saying that there is an adequate air-raid shelter on the premies. The Institute has its own canteen, and the club intends carrying on despite anything that may happen, other than a direct hit! We congratulate Mr. Bird on his enterprise in forming this club, which we feel sure will be welcomed and well supported once its existence has become fully known.

It is interesting to note that the L.C.C. are aware of the value of model aircraft construction, and the subject is one that has been officially approved for classes.

No doubt other Institutes in London, and also in large provincial cities, will organise similar classes, and we invite them to send us particulars, so that we may publish the appropriate information.

Reports of S.M.A.E. Council Meetings

As we close for press we have received from the hon. secretary of the S.M.A.E. a letter in which he states that the Hon. Press Secretary of the Society, at the last emergency Committee meeting, drew attention to a certain paragraph in our last month's Editorial. This paragraph reads as follows:

> " The pages of THE AERO-MODELLER, of course, have always been available, and will continue to be available, for publication of such reports of the S.M.A.E. Council Meetings as we receive, and we do endeavour to publish them as soon after receipt as possible. Unfortunately, it has not always been possible to do this, as sometimes the reports have not arrived until 10 or 14 days after a meeting was held, and have, therefore, missed the next possible issue."

The hon. secretary states in his letter that the Hon. Press Secretary " suggested to the Committee that this paragraph implied that there had been some laxity on his part (in sending in reports); and he therefore wished to submit information to prove that this was not the case."

Having recovered from the rather queer " suggestion " that we should comment on any subject by implication rather than by direct reference, we proceeded to examine the information submitted by the hon. press secretary, and regret to say that our expression—" sometimes the reports have not arrived until 10 to 14 days after a meeting was held "—was incorrect. We hasten to make the necessary correction, and beg to revise our statement to read: " Sometimes the reports have not arrived until 16 to 23 days after a meeting was held." These being the intervals elapsed between dates of the last two meetings and our receipt of the reports.

We feel that we should explain to readers that we do not receive previous notice of the dates of S.M.A.E. Council meetings, neither are we normally given an indication as to when we shall receive the reports—" they just arrive." From a further examination of the information submitted by the hon. press secretary we note that at other times we have received reports from two to eight days after the meetings had been held.

Of course, the period of time between a meeting and our receipt of the report is not nearly so important *as the relationship between the date of the meeting and the date on which our next issue goes to press.* We received reports of meetings held on May 8th and July 5th on May 16th and July 13th respectively. Had we received them a couple of days after the meetings were held, and *known* that we should receive them by that time, we could have included them in our issues published on the 20th of May and July. Actually they had to be published on the 20th of June and August respectively. Some five to six weeks after the meetings were held.

When Council meetings were held on dates such as 11th to 16th of the month, naturally the reports could not be published until the following month, again about five weeks after the meetings had been held.

Any question of " laxity " on the part of the hon. press secretary in sending us reports of Council meetings would, of course, be a matter between him and the Council from whom he receives his instructions, and to whom he is responsible, and since the Council is under no obligation to send reports of its meetings to THE AERO-MODELLER, it would be quite impossible for us to offer any comment on the hon. press secretary's duties, and we have not done so.

During the latter part of last year we received many enquiries as to what was happening to the S.M.A.E., and why were we not publishing any reports? Whilst, of course, from time to time, we have received comments on the fact that, when they *were* published, they were usually anything from four to six weeks " old." Because of this, we have felt that we should, in some detail, explain the procedure by which, during the past two-and-a-half years, we have received reports of meetings of the Council of the Society of Model Aeronautical Engineers. As already stated, we shall " endeavour to publish them as soon after receipt as possible," and that this is no idle statement may be seen on reference to page 223 of this issue, on which is published the report of the Emergency Committee's meeting held on February 4th last. We received this report on February 8th, by which time, of course, the journal had been " paged-up," and in fact the centre pages were at press. However, in view of its importance—dates of the main competitions of the year are now given—we pulled out a page article by Mr. Len Stott, hon. secretary of the Halifax Club, and inserted the report. (We apologise to Mr. Stott, particularly as his article was entitled " *Now's* the time " —meaning *now* is the time to build that new spring model! However, we will print the article next month, altering the title to " Then *was* the time "!)

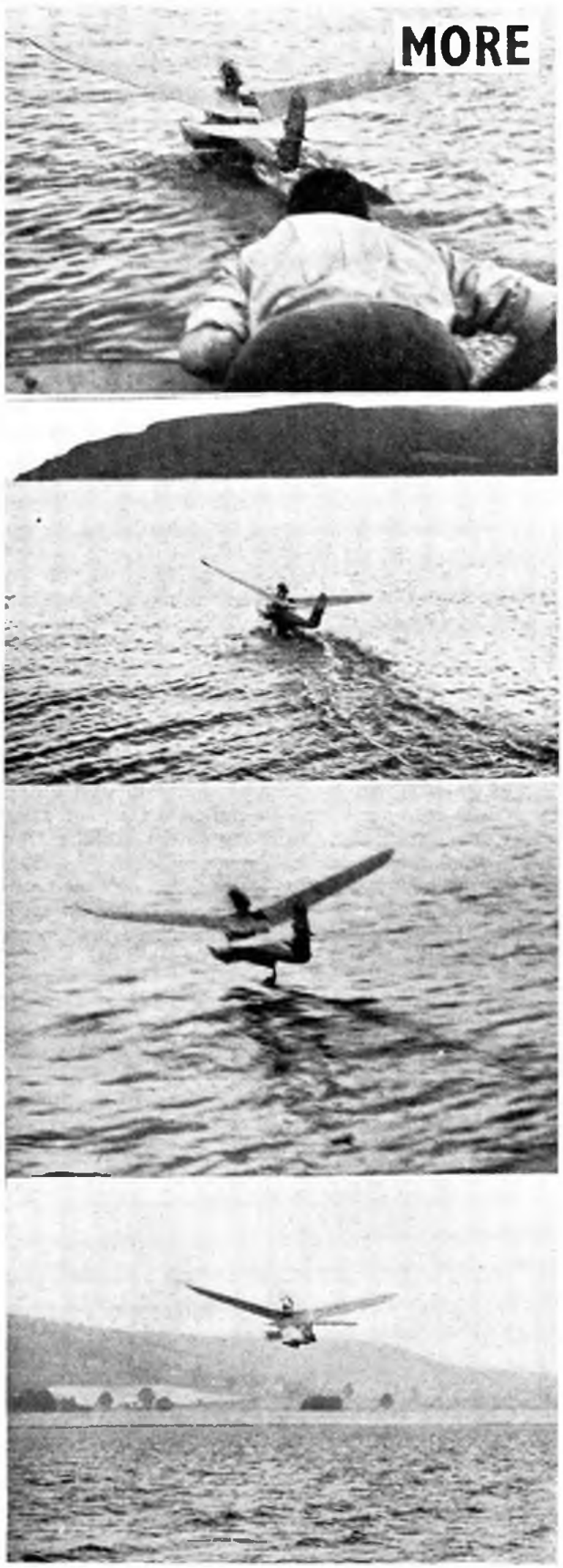
Tailpiece—Bringing Up Father!

We recently received the following letter from a young applicant for membership to the N.G.A.

" Would you please send two badges, as most of the models are the joint property of myself and my father—he is interested in the rubber models and I confine myself to petrol models."

We wonder what type of model *grandson* will confine himself to? Airships . . . or transatlantic 'planes?

THE EDITOR.



MORE ABOUT THE BUILDING AND

By DR. J. F. P. FORSTER

We are pleased to announce that Dr. Forster is going to edit a monthly feature, "Petrol 'Plane Topics," which will commence in our next issue. Readers are invited to send in short details, with photographs, of their models. Queries will also be answered in this feature.

REASONS influencing aero-modellers in their choice of types are many and varied. Foremost among these, unfortunately, is the ever-present one of finance, but probably next come considerations of local facilities for actual flying. Like many other readers of THE AERO-MODELLER I am many miles from the nearest club, and professional ties keep me near my home; living, as I do, on the edge of Exmoor in very hilly country, the flying of petrol models is a thorny pastime, in more senses than one, with the inevitably high incidence of "crack-ups" in hedges and trees. Nevertheless, the incurable disease resulting from the bite of the petrol bug goads me on, and I persevere in fields which are really quite unsuitable—my largest being barely 100 yards wide and perhaps 250 yards long.

My friend, Major Bowden, whose interesting article on Flying-Boats in the December issue should fire others with enthusiasm, knows my country well, and, in fact, conducted most of his experiments on ultra-light-weights under these difficult conditions. It was, therefore, hardly surprising that I fell an easy prey to his temptation to turn, as an alternative, to flying-boats on the sea, where space is unlimited. Although I am eternally grateful to him for his unintentional lead, I feel bound to say (and he knows it) that from the start I was not smitten with the urge to "go and do likewise."

On the contrary, my chief incentive, when I set about designing my first flying-boat last January, was to try to show him the "error of his ways" by producing a machine bearing some sort of resemblance to a scale model, which was capable of getting off the water unassisted, and possibly breaking that ridiculously low record of his, which still stands at the tempting figure of 30 secs., and thereby disproving a theory of his concerning large planing areas.

Unfortunately, I had only just time to complete it before availing myself of his kind invitation to visit him in Gibraltar, where we only had one very brief opportunity of observing its behaviour (or perhaps I should say misbehaviour). His conclusions *re* its shortcomings in longitudinal stability have not proved strictly correct—the trouble having turned out to be really due to insufficient lateral stability on the water, resulting in its blowing over on to wing and stabiliser-tip. Subsequent modifications raising the stabiliser clear of the water and increasing the span of the sponsons have proved her to be a very seaworthy boat, and water in the tailplane is now a thing of the past.

Now there is no real reason why the model flying-boat

This amazing set of photographs, taken by Mr. Burgoyne, a friend of Dr. Forster's, shows the whole course of a successful flight. At top left the flying-boat is shown riding on the step with the sponsons clear, whilst the next three photos show the model climbing.

FLYING OF PETROL ENGINED FLYING-BOATS

should not become very much more popular than it has been so far in this country.

In the first place it is much more interesting, and offers more of a problem to the keen aero-modeller because it necessarily entails the mastery of two elements simultaneously.

Secondly, in spite of much that has been said to the contrary, water is definitely *not* as hard to land on as is the ground. Broken props. are unknown, while structural " crack-ups " are almost non-existent, even after the most hair-raising disasters, such as power dives from 80 ft. slap into the sea ! (Yes, Mr. Editor, I've had some).

The third and most delightful advantage of over-water flying is the grand sensation of freedom from obstructions afforded by a large expanse of water, and the certain knowledge that wherever the engine cuts out there is a good level landing space. The further advantage of long flights of two or three minutes in safety I also find attractive.

I cannot too strongly endorse Major Bowden's remarks concerning the thrill and beauty of the off-water take-off : the flurry and spray as she gradually climbs on to the main step with the surprising acceleration which occurs once this is attained ; then the gradual diminution in wash, culminating in the final " unsticking," as the model becomes air-borne with the last traces of water dripping from her hull.

The foregoing remarks are all " pros " ; what about the " cons " ? In my opinion there are no serious cons —at least, none that are insurmountable. Major Bowden has publicly proved this by creating his record before three official S.M.A.E. witnesses, and although unofficial records are, I know, frowned upon, nevertheless I do claim to have had several flights out of my first model this year of over two minutes (R.O.W. without a push), and the accompanying series of photographs, many of them taken at considerable range and enlarged will, I hope, fire others with enthusiasm, if not convince the sceptics.

The chief snags in my experience are :—

(1) Handling a large model in a rocking boat.

(2) Keeping ignition dry—keep coil high and H.T. leads short.

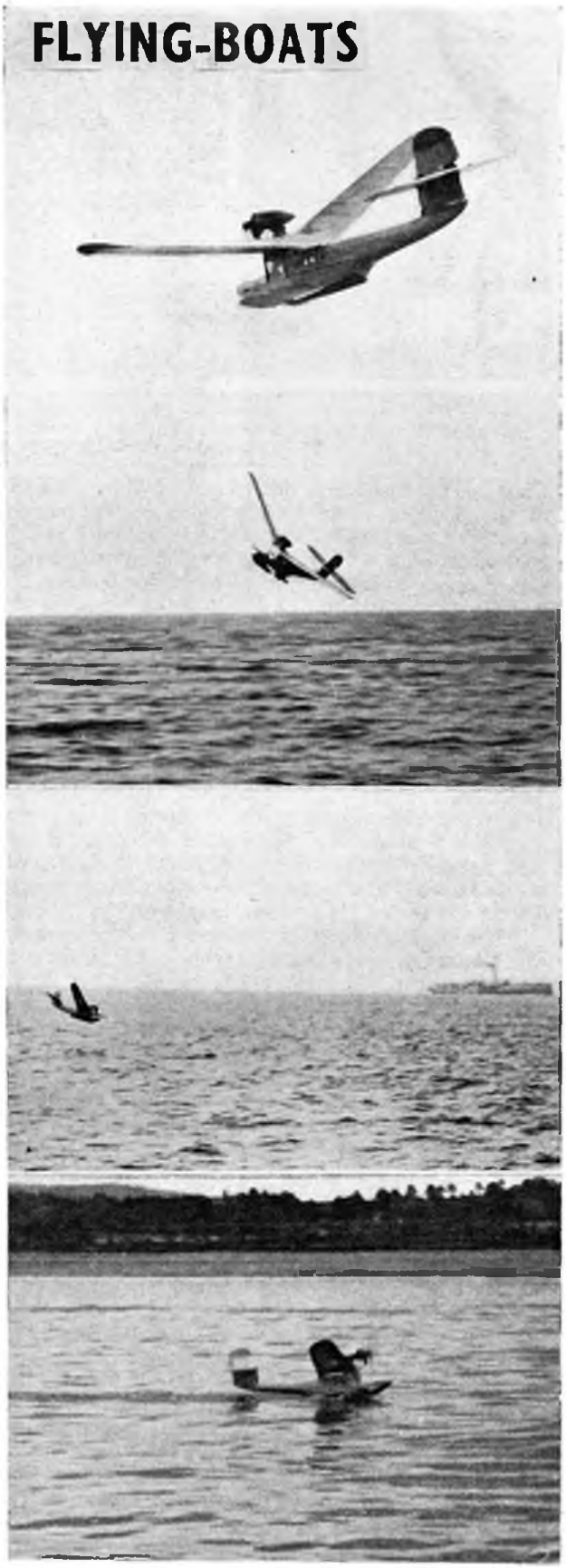
(3) Effects of sea-water on engines—Brown's and Cyclones O.K., and non-corrosive ; Phantoms are vulnerable.

(4) Clock-timers ruined by sea-water—keep dry or eliminate.

Flying on fresh-water lakes or reservoirs is a tremendous advantage, as it is rarer to get much of a swell in the absence of wind, and fresh water does no harm to engines.

I *have* found, however, that sparking plugs don't seem to like being plunged into cold water when nearly red hot after a long flight ! Moral : Get your model perfectly trimmed on the glide, and you will have happy landings.

While on this subject, I am convinced that the only reliable procedure in adjusting the model is to test-glide it on to water from a good height. (I glide mine off the quay wall of a little harbour some 20 feet above water).



The photos on this page show the flying-boat in flight and coming into a safe " landing " on the water. Note the steamer in the bottom photograph but one.

Here is Dr. Forster with his model. Span is 6 ft. 9 in., weight 4¾ lb., engine 9 cc. Brown. The wing loading is 15 oz./sq. ft.

Once this is satisfactory, don't touch anything, but adjust the power-flight solely by altering the offset or down-thrust of the engine. This, of course, assumes as a foregone conclusion that you use the standard detachable engine mount so long advocated by Major Bowden. This is doubly important on flying-boats to facilitate the giving of the whole engine an oil or paraffin bath after a day's flying.

Personally, I have now perfected an arrangement for all my model engines to be detachable units, complete with tank and condenser. My fuselages simply contain coil, timer and battery, and I have a universal test-block on my work-bench similarly equipped, into which any engine unit can be rapidly attached with rubber bands. Test runs, adjustments to contact springs, etc., can be done in a comfortable sitting posture with good illumination, instead of in the eternal back-aching " squat," which is undoubtedly the cause of the increasingly prevalent disease known as " petroleers' lumbago."

While on the subject of engines, I cannot understand why so many modellers will persist in running their engines upright. In many rotary valve engines, it is frequently difficult to get the mixture rich enough for easy starting in this position, because petrol simply drips from the needle valve and does not get drawn into the induction pipe until the engine is revving. For every once that the mixture is too rich, there are quite six times when it is really too weak in this position. A very few swings soon get rid of a too rich mixture, but no amount of cranking will turn a weak mixture into a rich one. An inverted Cyclone, for instance, starts first or second kick if the induction pipe is allowed to fill brimming full of " Petroil." It is well known that, aerodynamically, a high thrust line is correct, especially with the large amount of dihedral we have to use in this climate, and when we come to flying-boats, in order to get prop. clearance alone, it is a physical necessity. An upright engine under these circumstances not only looks ridiculous, but puts the C.G. unpleasantly high for lateral stability on the water, in addition to necessitating long H.T. leads. The insulation of the H.T. lead in a flying-boat, often covered with droplets of spray, presents quite a problem, and the shorter it is kept the better. On my boat I have finally cured this source of trouble by carrying the H.T. lead through a 3 in. length of ebonite tubing salved from one of my prehistoric wireless sets.

With regard to hull design, it is obvious that the larger the planing area in contact with the water, the shallower will be the immersion. I actually went so far as to work out, with the aid of a distant schooldays' memory of the " Principle of Archimedes," the displacement of water at the estimated weight of my boat, in order to decide at what height to arrange the Sponson-floats on the side of the hull. This is not really necessary, but it is important to arrange that they will be clear of the water a little before the main step parts company.

Major Bowden's original record maker had a large, almost flat-bottomed (though stepped) " punt-like " pontoon (I hope he will forgive my description !) which, he maintains, assists take-off. After my experiments made in the face of his advice, I cannot entirely agree with him. I agree that the arrangement of a large flat planing area does greatly assist the initial speed over the water (note the word *over*, not *through*), and thereby gets the model on to the main step quickly, but the final unsticking is made more difficult than with a wide V-shaped or rounded bottom, there being a definite suction to overcome with a large flat area, whereas with a V-bottom the volume immersed progressively diminishes as the model becomes air-borne. In my opinion we should strike a compromise by having a rounded or V-bottomed hull, but locate the Sponsons a fraction lower than is really necessary for purposes of lateral stability when at rest. This means that the Sponsons then fulfil two purposes at once, by providing lateral flotation when at rest, and extra planing area at all but the highest speeds just before take-off. For this reason I decided to carry the main step out on to the Sponsons. The result, in practice, is excellent, as the boat first rises on to the Sponson step and finally on to the slightly deeper and rounded step of the hull, which unsticks quite easily.

When we come to consider the landing qualities of flat-bottomed and V-shaped hulls, the latter has it all along the line by reason of its obvious shock-absorbing qualities. The fearful smack of a flat-bottomed hull on impact can be well imagined, and if by unlucky chance this occurs on the near side of a swell, the resultant high bounce makes a very wet and ugly landing, and may damage sponsons, whereas the V hull cleaves the water, to go skimming on to a delicious landing. There is something very attraactive about these landings, and I can almost see my boat " wagging her rudder " in satisfaction, like a duck after landing on water.

With the commandeering of many flying grounds, and the ubiquitous job of finding space for our hobby, what about it? I am proposing to offer a cup for annual national contest for petrol flying-boats, and hope that the S.M.A.E. will put it up for opening competition the first year after the war. As a parting encouragement (alright, Mr. Editor, nearly finished !) remember that plywood bottoms are cheaper and lighter than undercart wheels, and flying-boat hulls can be built lighter than comparable landplane fuselages plus undercart. One last tip, learn from bitter experience : Attachment of silk to hulls with photopaste leads to endless trouble, as no matter how much dope and paint is used, sooner or later water unfailingly finds a way in, and seeps under the whole covering, which then becomes loose. I now apply a liberal coat of full strength dope and allow to dry. I then apply another coat and clamp on the silk quickly before it dries, smoothing well down. When dry I apply a third coat over the silk, followed by a coat of paint. Result : A permanent and absolutely water-tight bottom. Now, chaps, go to it, and let us see that out of the evil of the black-out can come good !

"ON TEST"—— FROG "PENGUIN" SERIES

The Vickers "Wellington"

REPORT BY "TEST PILOT"

THIS month our " On Test " deals with " solid " models. Lines Bros. Ltd., Tri-ang Works, Morden Road, Merton, S.W.19, who distribute the famous " Penguin " series for International Model Aircraft Ltd., have sent us a representative selection of their kits for inspection.

We received the following: " Blenheim," " Hart," " Lysander," " Spitfire," " Wellington," and a kit for constructing a model seachlight and sound locator to the same scale as the model aircraft.

Before commencing work I spent a pleasant half-hour examining the contents of the kits, and marvelling that such minute pieces of workmanship could be made so faultlessly.

I eventually decided to construct the Vickers " Wellington," as this was the largest of the range, and I thought it would make an imposing model.

The fuselage, like the wings, tail unit, etc., is supplied moulded in two halves, hollowed out with walls of about $\frac{1}{32}$ in. thickness. Every detail is embossed on the outer surfaces.

The lattice windows for which the " Wellington " is famous are supplied cast in transparent material with the frames embossed on the inner surface. I fixed these in place, and after painting the interior and adding the pilot's seat, etc., I cemented the two halves together.

The wing halves are moulded complete with engine nacelles, elevators, flaps, landing lights, etc., all minutely embossed or engraved on their surfaces.

Six leaflets were given with the kit. The plan is excellent, showing every detail and being reproduced from drawings supplied by the makers of the prototype. There is a large leaflet of instructions on building and painting, sundry small leaflets giving the war-time history of the machine, detail of new colour schemes, squadron markings, and, finally, a large shadow shading diagram.

All the parts for the engines, retractable undercarriage and tail assembly are supplied moulded, together with exhaust collector rings to be cemented on to the cowlings and lead " Pegasus " engines to be placed inside them.

All this sounds delightfully easy, and perhaps readers would think that there can be nothing much in making one of these models. But they would be wrong, for it is the same with this series as with any other " solid " kit; it is left to the builder's ingenuity and skill as to what kind of a job the model is when complete. It is the finish that makes or mars any scale model, and these are no exception to that rule.

The retractable undercarriage took a while to aassemble, but when it was complete I was extremely pleased with the smooth way that every part " clicked " into position. Only precision machinery could turn out parts that fit so beautifully.

The undercarriage is " fixed " by means of a pin lug, which, when hinged away, allows the whole unit to fit snugly into the " well " in the engine nacelle, as on the full-sized machine.

The two gun turrets and windscreen are provided moulded out in transparent material, with the exact window patterning embossed on their surfaces. They fitted snugly, and only required a spot of cement here and there to fix them.

The machine-guns and wireless masts completed the external details.

Paint was supplied with the kit, but as the model was already moulded in " dark earth " colour, it was only necessary to paint in the " dark green " portions as shown in the " shadow shading " plan.

Black paint for the under surfaces was also supplied, and a bottle of silver for touching up.

There were some beautiful little transfers of squadron markings and R.A.F. circles (right up-to-date), and these only required placing in water to make them ready to apply.

The completed model, a photograph of which accompanies this report, looks really magnificent; the embossed surfaces, the gun turrets and minute details giving it that " super-realistic " touch.

Men serving with H.M. Forces who have no time to whittle wood to shape, will find these kits ideally suited to their requirements, as for identification purposes this series is ideal.

International Model Aircraft Ltd. manufacture, and Messrs. Lines distribute, a very wide range of kits in this series, covering most modern military types and many accessories.

I commend these kits for their wealth of detail, workmanship, simplicity of construction and accuracy of design. It is extraordinary how many little specially moulded pieces are incorporated in the building of one model, and the manufacturers are to be congratulated on the way in which they are so neatly and correctly packed in the boxes.

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WIND-TUNNEL TESTS ON MODEL AIRFOILS

By E. J. POWDRILL and A. H. W. MACBEAN

(By kind permission of Dr. R. H. J. Brown)

WE recently had the opportunity of making some tests of model airfoils in a low-speed wind-tunnel, in the Zoological Laboratory in Cambridge. The tunnel was of the enclosed-section type, and had a working section of 20 in. × 30 in. It was designed to run comfortably at 20 m.p.h. Although this speed is somewhat higher than that at which models normally fly, no serious errors will be introduced if the characteristics obtained at 20 m.p.h. are used in calculations relating to 10 m.p.h., since the Reynolds Number does not pass through any critical state between these two speeds.

The airfoils used were actual model wings, having normal tissue covering, and elliptical tips. The spars were recessed so that they did not touch the covering, and care was taken to avoid sharp changes of curvature at the leading edge. At the root of the wing an end-plate was used, to simulate the effect of the fuselage.

SECTION N.A.C.A. 6512.

Wing tapering 5 in. to 3 in. Area 56 sq. in. Aspect ratio 8.

Angle (above no lift).	Lift.	Drag.	Angle of incidence.	CL.	CD.	CL/CD.
	lb.	lb.				
0	0	·0225	−6′	·00	·057	0
2·5′	·080	·0195	−3·5′	·2025	·0484	4·10
5·0′	·14	·0180	−1·0′	·355	·0455	7·80
7·5′	·200	·0195	1·5′	·5065	·0484	10·25
10·0′	·260	·0210	4·0′	·658	·0532	12·4
12·5′	·300	·0240	6·5′	·760	·0608	12·5
15·0′	·320	·0285	9·0′	·810	·0722	11·20
17·5′	·352	·0372	11·5′	·890	·094	9·45
20·0′	·340	·0480	14·0′	·860	·1215	7·10
22·5′	·336	·0735	16·5′	·850	·186	4·56

Reynolds Number 61,700.

N.A.C.A. M.6.

Wing-shape as above.

Angle (above no lift).	Lift.	Drag.	Angle of incidence.	CL.	CD.	CL/CD.
	lb.	lb.				
0′	0	·012	0′	·0	·0295	0·0
2·5′	·100	·0105	2·5′	·2458	·0258	9·52
5·0′	·120	·0105	5·0′	·2948	·0258	11·4
7·5′	·180	·0135	7·5′	·442	·03315	13·30
10·0′	·200	·0150	10·0′	·491	·0368	13·3
12·5′	·236	·0192	12·5′	·580	·04715	12·3
15·0′	·260	·0270	15·0′	·638	·0663	9·63
17·5′	·244	·0525	17·5′	·599	·129	4·64
20·0′	·228	·0720	20·0′	·560	·177	3·16
22·5′	·228	·0915	22·5′	·560	·225	2·48

Thus, the results obtained can be applied directly to model aircraft without any corrections being applied for tip-losses and fuselage interference.

The sections tested were: N.A.C.A. M.6, N.A.C.A. 6512 and R.A.F. 32. (Profile ordinates for N.A.C.A. 6512 and R.A.F. 32 were given in THE AERO-MODELLER of May, 1939). The wings were of tapering plan-form, the dimensions being given with the table of results.

In the actual tests, the incidence was measured from the position of no lift. This angle was found from the official reports on the sections, and suitable corrections were made in order to obtain the true angles of incidence, measured relative to the datum-line of the section. This estimate of the incidence is quite reliable, since the no-lift angle does not change appreciably with varying Reynolds Number.

SECTION R.A.F. 32.

Wing tapering 4·38 in. to 2·92 in. Area 52 sq. in. Aspect ratio 9.

Angle (above no lift).	Lift.	Drag.	Angle of incidence.	CL.	CD.	CL/CD.
	lb.	lb.				
0′	0	·024	−7′	·0	·0654	0·0
2·5′	·12	·018	−4·5′	·3265	·0490	6·67
5·0′	·192	·018	−2·0′	·5225	·0490	10·68
7·5′	·240	·021	0·5′	·6540	·0572	11·44
10·0′	·300	·0244	3·0′	·8160	·0665	12·28
12·5′	·348	·0303	5·5′	·9460	·0825	11·47
15·0′	·364	·0375	8·0′	·9910	·1020	9·71
17·5′	·364	·0450	10·5′	·9910	·1224	8·09
20·0′	·342	·0705	13·0′	·9310	·1918	4·85
22·5′	·320	·0945	15·5′	·8710	·2570	3·38

Reynolds Number 56,911.

The results are extremely interesting, especially when compared with the officially published characteristics of the sections. As we should expect, the values of CL are lower, and those of CD higher, but we note that the maximum value of CL/CD occurs at a considerably higher incidence than in the official tests, conducted at much higher Reynolds Numbers.

Thus the problem of effecting a compromise between a high CL/CD and a high CL does not arise in the case of our model wings. Also, we see that the practice of flying model airfoils at 4 ft. or 5 ft. positive incidence, arrived at by trial and error, is borne out by these tests.

We see that R.A.F. 32 is slightly better in general characteristics than N.A.C.A. 6512, having a higher maximum lift coefficient and a better stall, but a slightly lower maximum CL/CD. The official figures would give N.A.C.A. 6512 a marked advantage.

Thus, an increase in mean camber does not necessarily give a higher lift.

We must also note the low values of the maximum CL/CD as compared with those obtained at higher Reynolds Numbers. This is not due to wrinkly tissue, etc., as the wings were of good workmanship. It thus becomes difficult to account for the gliding angles of 1 in 25, claimed by some American writers for their models.

The tests on M.6 were done largely for the sake of comparison. They show that although this type of section has a higher maximum CL/CD, the maximum CL is very low, and would give a rather high speed to a model using it.

Lift (in lb.) $= C_L \frac{\rho}{2} s.V^2$ where :—

$\rho = \cdot 00237$.
s = Area of wing (in sq. ft.).
V = Velocity of air-flow (in ft./sec.).

Drag (in lb.) $= C_D \frac{\rho}{2} s.V^2$

Tests on Other Components.

We were also able to measure the drag of the various components of two different models. In each case the fuselage and tail-unit were employed, and tests were carried out with and without undercarriage; the difference in drag was found when the free-wheeling propeller was replaced by a streamlined nose-piece; also, the difference in drag between a free-wheeling and a single-bladed folding propeller was found. Details of the two model were as follow :

(1) Fuselage, 25 in. overall, monocoque construction, circular cross-section, max. area 5·5 sq. in.

Tail-unit : Tail area 33 sq. in. Rudder area 16 sq. in.

Tail-section R.A.F. 34. Single rudder, symmetrical section.

Propeller : 12 in. diam., 18 in. pitch. Blade-width, 1·6 in. Spinner, freewheel, *and*

14 in. diam. single-bladed, folding. Spinner undercarriage : 7 in. streamline legs, 1·5 in. diam. wheels. Sprung by wire and rubber bands.

(2) Fuselage 24 in. overall, tissue-covered, rectangular cross-section, 3 in. by 2 in., becoming round at nose.

Tail-unit : Tail area, 36 sq. in. Rudder area, 12 sq. in. Tail-section Clark Y. Twin $\frac{1}{32}$ in. sheet rudders.

Propeller : 12 in. diam., 16 in. pitch. Blade-width, 1·75 in., spinner, free-wheel.

Undercarriage : 6 in. streamline bamboo legs, 1·5 in. diam. wheels.

Tests were conducted at 20 m.p.h., but a series of readings were taken at 10 m.p.h. to check the relation between drag and speed. These latter tests were not very satisfactory, as the fan-motor of the tunnel did not run steadily at this low speed, and the wind-speed varied to a certain extent. Still, they show that the drag can be expressed fairly accurately by the formula :—

Drag = k A V^2 where :—
k = Drag coeff. of object.
A = Cross-sectional area (sq. ft.).
V = Wind-speed (ft./sec.).

which is the formula given by theory.

The results obtained were as follow :—

Model No. 1.

Arrangement.	Drag (in lb.). 10 m.p.h.	20 m.p.h.
Fuselage, tail-unit, free-wheeling prop. ...	·0136	·0552
Undercarriage	*·0132	·0636
Fuselage, tail-unit, folding prop.	·0072	·0306
And undercarriage ...	·0102	·0396

* Due to variation of wind-speed.

Model No. 2.

Arrangement.	Drag (in lb.). 20 m.p.h. only.
Fuselage, tail-unit, undercarriage ...	·030
Fuselage and f.w. prop.	·0420
Fuselage and undercarriage	·0495

From these figures we can obtain the drag of the various components, plus drag due to interference.

No. 1.

Drag of undercarriage = ·0087 (av. of two results) (lb.). Excess drag of f.w. over fold. prop. = ·0243 (lb.). (20 m.p.h.).

No. 2.

Drag of undercarriage = ·0075 (lb.), (20 m.p.h.).
Drag. of f.w. prop. = ·0195 (lb.). (20 m.p.h.).

These results are chiefly useful in that they give us an idea of the order of magnitude of the drag of the various components. They show that the total drag of a model can be considerably reduced by folding the propeller and retracting the undercarriage. In the case of No. 1 model this reduces the drag of the model minus its wings, from ·0636 lb. to ·0306 lb. As the drag of the wings in this case is about ·045 lb., this is a reduction of 33 per cent for the whole model.

Using these results, a value for the lift/drag ratio was calculated for Model 1, which used R.A.F. 32 wings; it came to 6·8, a figure which is in accordance with the observed flight performances. If the undercarriage were retracted, and the propeller folded, the lift-drag ratio would be increased to 9·5.

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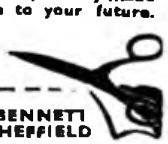

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GADGET REVIEW

Conducted and illustrated by C. A. H. POLLITT—"Aero-Modeller" Staff Draughtsman

DESPITE its very recent inception, Gadget Review has aroused such a widespread general interest that I have been literally inundated with ideas and suggestions from readers all over the country.

While I am very grateful for the whole-hearted support I have already been given, and I thank those who have taken the trouble to write and express their approval of the review, I feel it will be generally realised that my main concern is to deal with as many as I can of these gadgets, and to waste as few as possible.

For this purpose it has been decided to present Gadget Review regularly every month, and not as a bi-monthly feature, as was originally intended.

I shall make payment of from 2s. 6d. to 7s. 6d. for all gadgets published, so don't forget to let me have particulars of that natty little tail wheel you have designed, or was it a free-wheel device? Anyhow, whatever it is, if it is interesting and it works, let me hear something about it.

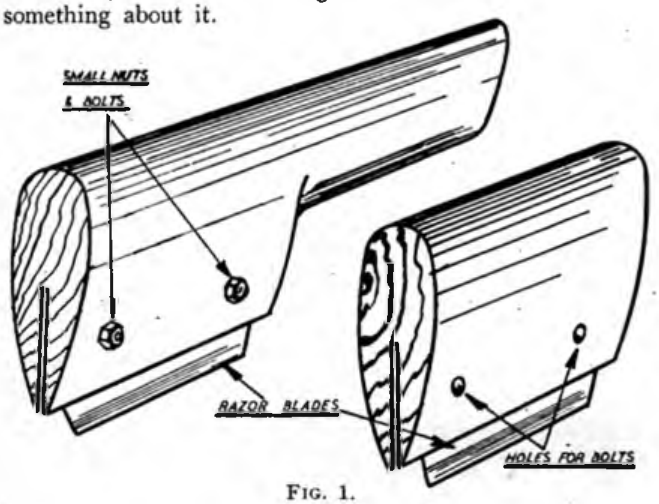
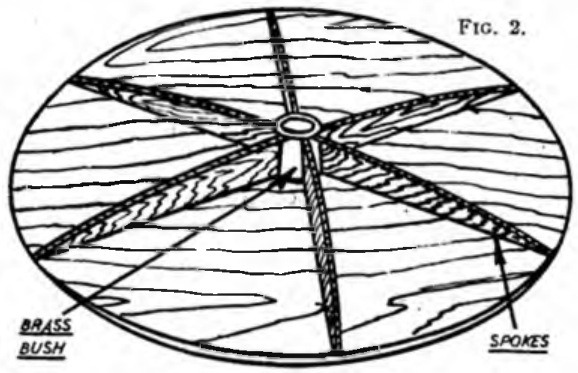


FIG. 1.

In Fig. 1 is illustrated an idea from Mr. P. C. Wode, of Roydon, in Norfolk, for two balsa cutting tools, as easy to make as they are useful to have. They comprise nothing more than a wooden handle with a saw cut at one end to accommodate a razor blade. the blade being secured by two small nuts and bolts, say $\frac{1}{8}$ in. dia.

FIG. 2.



From Mr. R. J. Blacker, of Selby, Yorks., comes an idea showing how to construct, quite inexpensively, a streamline wheel. The wheel itself is cut to the required diameter from a sheet of $\frac{1}{16}$ in. balsa, and on one side are glued six spokes of a shape similar to those shown in Fig. 2.

A brass bush is fitted through the centre of the wheel, and the entire wheel and spokes covered with tissue. The wheel is completed by finally soldering a small washer to each end of the tube.

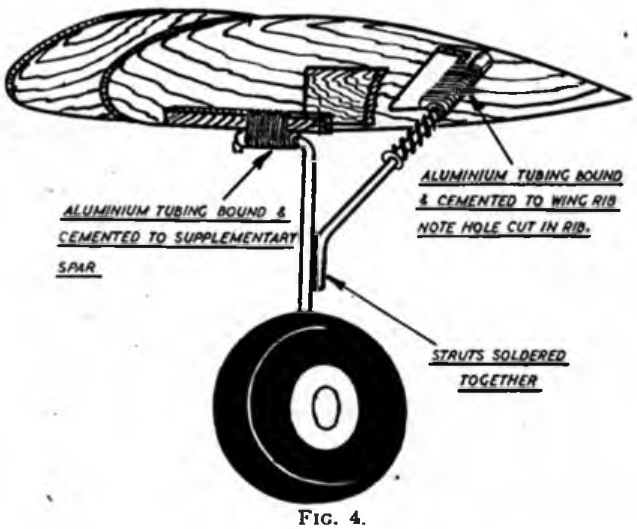


FIG. 4.

Judging by his very robust undercarriage design it is obvious that Mr. J. Hart, of Wistastow (near Crewe) has had some unhappy landings, as well as happy ones. In Fig. 3 the arrangement is shown clearly. The undercarriage leg is carried in a short length of brass tube, which is in turn secured to a supplementary spar, conveniently placed between two wing ribs. A second length of brass tube, so arranged as to accommodate the diagonal bracing member, is bound and cemented to one of the wing ribs. All landing stresses are dissipated by the spring, which is compressed on landing by the washer soldered to the diagonal strut.

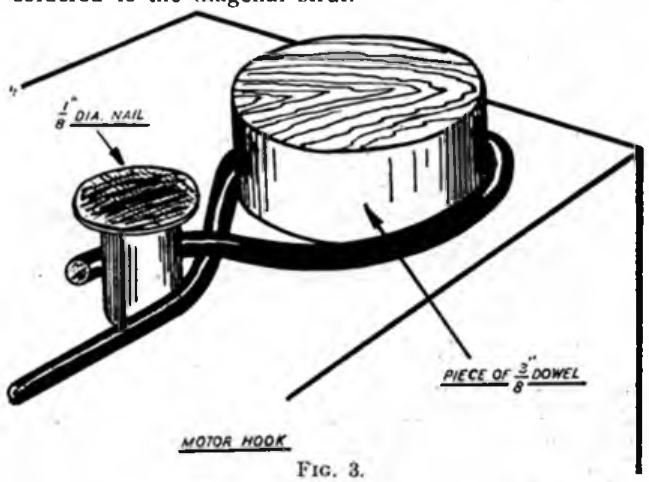


FIG. 3.

Mr. R. H. Ashworth, of Edgely, Stockport, has produced a small fixture for making motor hooks. This is a very simple little device, though one that really should be useful. A large-sized nail is driven into a block of wood, and in close proximity to the nail a piece of $\frac{3}{8}$ in.

dowel is fitted. The procedure, of course, is to bend the wire with which we are making the hook, first round the nail and then round the piece of dowel, as shown in Fig. 4. Actually, there is a knack in this, and that is to bend at right angles that end of the wire which hooks around the nail. This will prevent the possibility of the wire moving during bending.

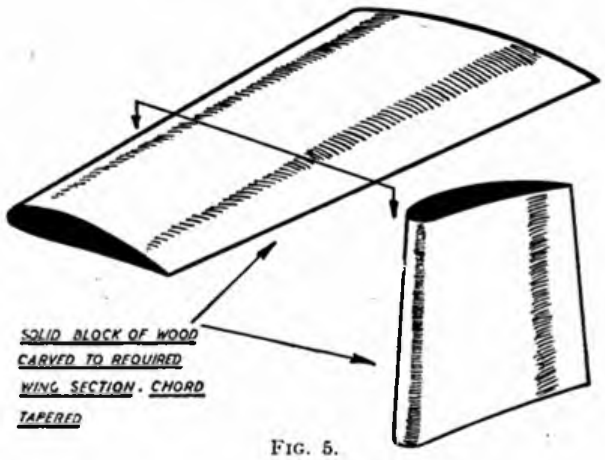


FIG. 5.

From Mr. W. Machon, president of the Forfar (Scotland) M.A.C., I have had a suggestion explaining how to mark out wing ribs of any particular chord. The idea is to first carve, from a solid hardwood block, a wing of exactly the same proportions as the built-up wing. If it is required to draw a wing rib with, say, a chord of 5 in., the procedure then is to cut through the solid wing at that point where its chord is 5 in., and standing the wing on end as shown in Fig. 5, so use it as a template with which to mark out the required wing rib.

Suggested by Mr. R. Barratt, of Retford, Notts, Fig. 6 illustrates the method of using a carpenter's gauge for cutting sheet balsa into strips; from this sketch I think the application is fairly obvious.

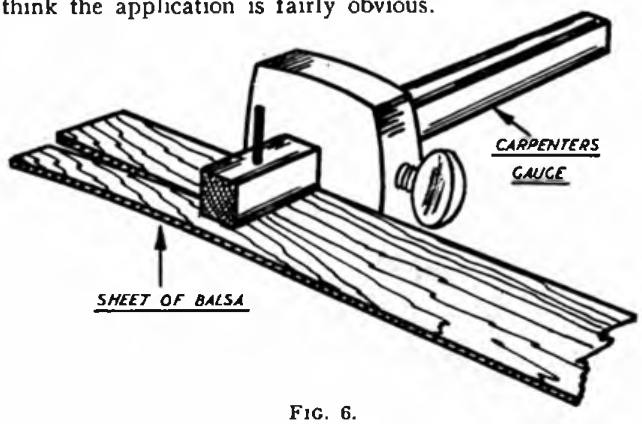


FIG. 6.

Co-axial propellers are not, as yet, a commonplace arrangement, and Fig. 7, which illustrates a possible design, is of rather unusual interest. Mr. J. R. Middleton, of Redruth, in Cornwall, is the originator of this particular design. The gearing is with ordinary small spar gears, one attached to hook A, and the other mounted on a short length of aluminium tubing, which passes through propeller 0. The propellers are of opposite hard pitch, and the twin motors are wound from the rear of the model and both in the same direction.

Master Roy Edmunds, of Southampton, who is 13

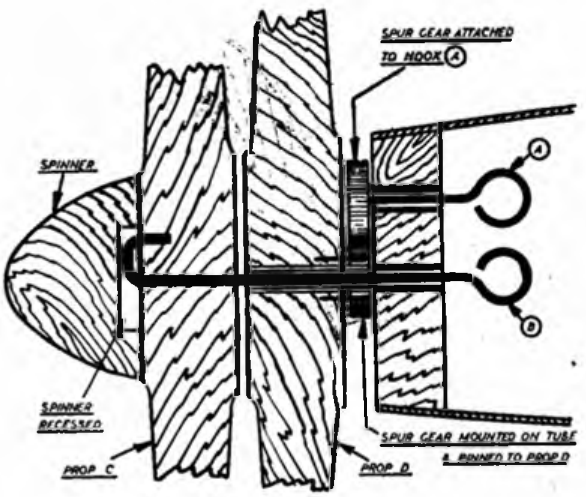


FIG. 7.

years of age, has sent me particulars of an undercarriage fitted with rubber-tyred wheels. The shock-absorbing arrangement of the undercarriage is rather unique, as will be seen from Fig. 8. I think the only weak point in this design is the method of carrying the undercarriage solely by means of the short length of wire inserted in the ends of the bamboo struts. Personally, I would prefer to have seen the brass bush in the fuselage former extended in length so as to allow it being inserted into the bamboo struts instead of the wire. Still, that is only *my* opinion.

The wheels are made from three or four laminations of $\frac{1}{8}$ in. sheet balsa and a length of $\frac{1}{4}$ in. square rubber, wrapped round the wheel in a groove prepared for the purpose. The tyres are rounded to shape by use of a warm poker!

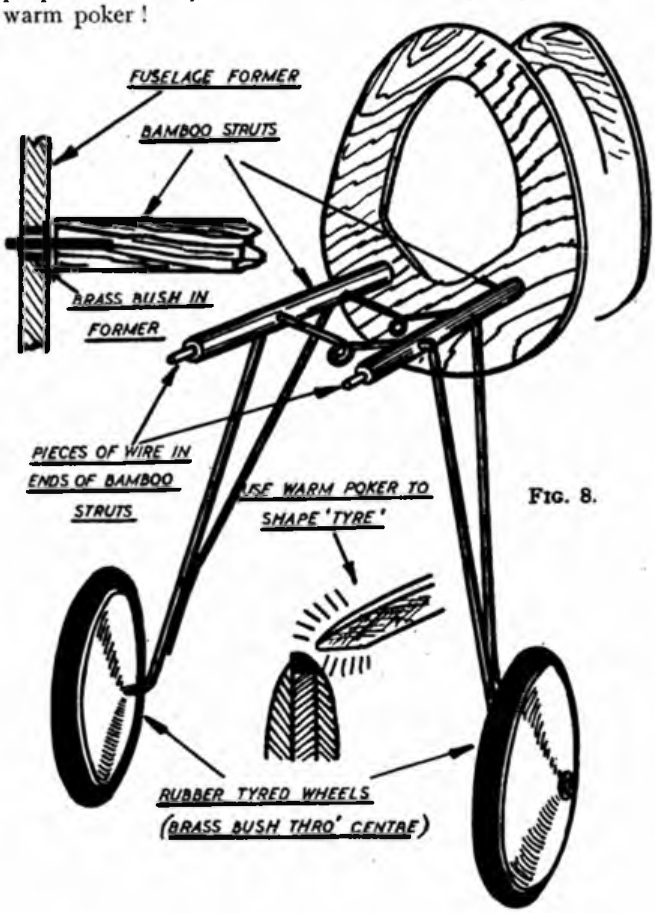


FIG. 8.

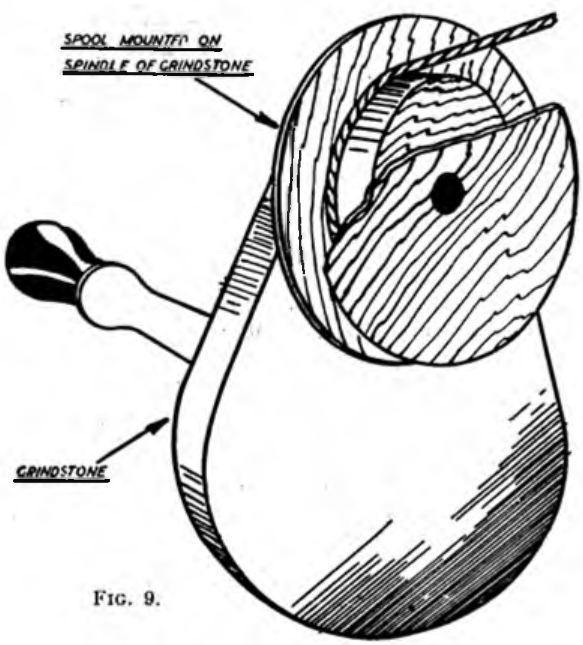


FIG. 9.

An obvious method of using a Woolworth's grindstone as a winch is suggested by Mr. K. E. Sharpington, of Sidcup, Kent. As usual, the stone has to be removed from the grindstone, and in its place a spool fitted. This latter is made up of one piece of $\frac{3}{4}$ in. timber 2 in. diameter sandwiched between two pieces of three-ply wood, each three inches in diameter. The spool should be drilled a shade smaller than the diameter of the grindstone spindle, and then forced on to same. The finished winch is as Fig. 9.

Another balsa strip cutter is that shown in Fig. 10, and sent in by Mr. K. C. Harfitt, of St. Albans. The razor blade is held at the top by a small screw to the block of wood, fitted to the wooden strip running from end to end of the base piece. The detail view on the right in Fig. 10 shows the cut-out in the base piece, and in which cut-out the bottom end of the razor blade is secured again by means of a small screw. The distance from the razor blade to the face of the long strip of wood is the width of the balsa strip that will be cut. The balsa, incidentally, is fed along from end to end of the fixture, and kept firmly against the edge of the long strip of wood, which is in effect a form of guide piece.

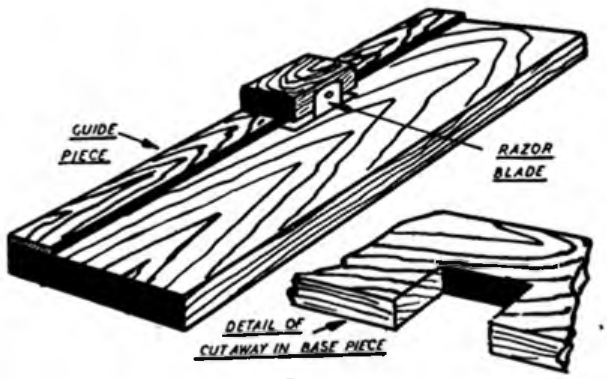


FIG. 10.

Lastly, I have a drawing from Mr. W. R. Jesse, of Liverpool, showing a detachable undercarriage. This undercarriage is located on top of the fuselage by means of two blocks of balsa, which may be shaped as shown in Fig. 11. In the side of the fuselage it is necessary to have a wooden panel—balsa would do—to accommodate a small washer let in each side of the fuselage.

To prevent the legs " splaying " apart an elastic band is passed over the fuselage legs, as shown.

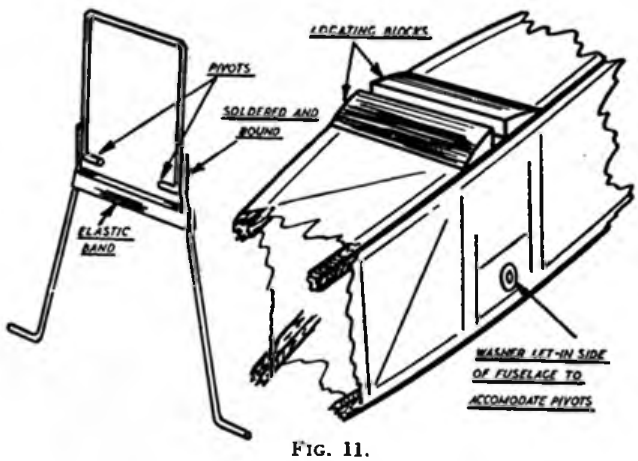
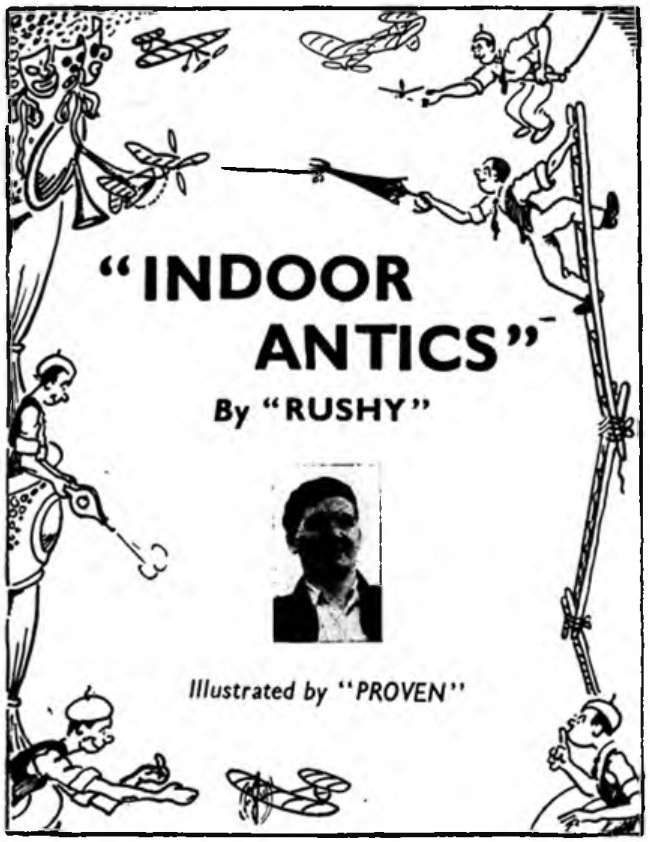


FIG. 11.

In the next issue of " Gadget Review " I shall deal, in addition to other things, with as many as possible of the gadgets I have already received, plus those I know so many of you are going to send me, so don't forget to let me have your ideas, you chaps!



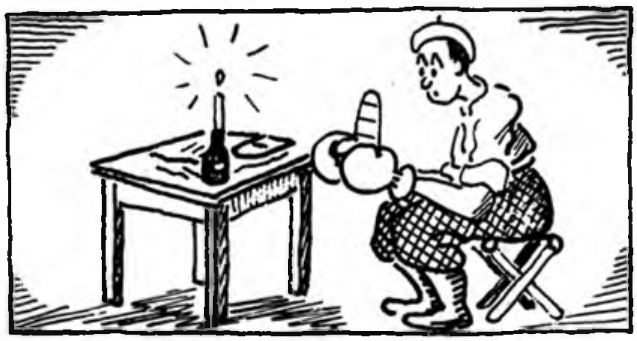
BEFORE a number of my misguided friends jump to conclusions, let me classify the title of this article by stating that it applies to my activities solely in connection with the building and flying of indoor models. Whilst claiming a certain amount of proficiency at most of the other pastimes usually associated with damp glasses, etc., etc., etc., such items are not for this occasion, and may make their appearance in the years to come—and anyway, *honi soit qui mali pense*, you know!

For some years I, with others, regarded the " indoor " model as something especially reserved for the idiosyncrasies of our American contemporaries, who seemed to have much better facilities for the wafting around of floating sausage skins, and it was not until, during the course of a spasmodic correspondence with Frank Zaic, that I began to give the microfilm model more than a passing thought.

The receipt of a supply of extra light balsa, which I was assured was *the* thing for such models, had more the effect of putting me off than stimulating my interest. Having to fly my models under generally rough conditions had developed in me a tendency to strong building, and to contemplate forming $\frac{1}{32}$ in. tips, etc., from such frail material seemed beyond my capacity, and again I gave the indoor model the go-by. I did, however, experiment with the tin of microfilm solution included in the parcel, and immediately made an unholy mess of the communal bath-tub, my hands, one perfectly good pair of flannels, and failed to get even one sheet of film to stick to the frame. (At least, it stuck to the frame all right, but the darn stuff would not come unstuck from the water!)

And so, for some months, the select band of " indoor " experts was spared the invasion of the " Pest from Oop North." It was always a sore point with me that the only decent place to fly these models was the Albert Hall in London, and it was this factor perhaps more than anything else that delayed the interest in this type of model in districts outside easy reach of this venue.

With the commencement of regular indoor meetings at the Albert Hall I began to sit up and take notice, and decided to have a smack at building one of these " transparent atrocities." Having a complete lack of either experience or tutorage in this type of aero-modelling, you can suppose that my first efforts were both long-winded and ham-handed.



. . . " *long winded and ham handed* . . ."

The first thing to do was to select a design, and, being the first effort, the reasonable thing to do was to build a well-tested design, and an easy-looking job was selected from Zaic's Year Book of 1937. This was a fuselage type, all angles, and a most weird-looking contraption. However, following my usual practice, and taking the easiest way out of things, I decided that simplicity counted, and got down to the construction of this, my debut into " hush-hush " flying.

The fuselage was an easy affair, built from $\frac{1}{16}$ in. square balsa, cross-braced with narrow strips of jap tissue, the whole being tissue-covered. Restraining the impulse to dope the finished job, I proceeded to build the wing, tail and fin, and then the fun started! Up to then I had always considered myself fairly dexterous with the digits, but I now seemed to be working with my hands encased in mittens, and much wood was wasted and many cuss words blasted until I began to get the hang of things. Gradually the family learnt to pass the building-board at a slow march, as even the smallest draught seemed to eliminate hours of patient work!

The most ticklish item was the construction of a hollow tail boom. Using 1/64 in. sheet, I was certain that the darn thing would never hold the tail and fin steady in flight, and three attempts were made before a decent-looking article took shape. The first one failed when the blank split right down the middle while bending, and the second disappeared mysteriously until found stuck to the instep of my shoe, looking very much the worse for wear! Tch, tch—such language!

Then, with the framework completed, it was decided to try and get some sheets of microfilm made to cover the contraption. And did we have fun! After a solemn promise to clean up all mess made, and to take the first bath following the operation, the necessary materials were assembled and the onslaught commenced.

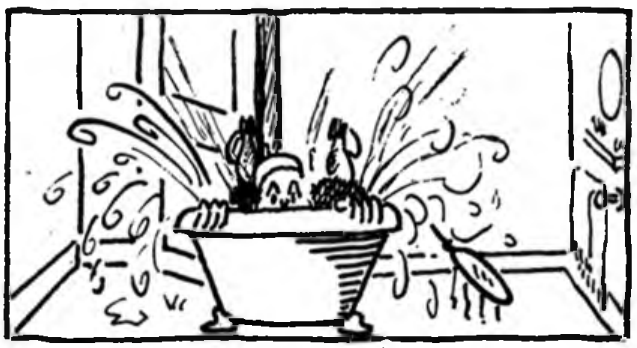
'Strewth! Talk about " every picture tells a story." At the end of half an hour bending over the bath, moving in slow-motion, and failing to get even one sheet of film

on the frame, I had a kink in my back that took days to straighten out, and an empty bottle that had once contained microfilm solution. Enough for the day was a sufficiency thereof. . . . !

Luckily, I was due at a Council meeting in London during the following week, and took the opportunity of buying a couple of tins of fresh solution—one to practise with and one to be serious with. Judicious " pumping " elicited a few tips for successful tackling of the job, and a fresh start was made.

In the light of subsequent experience, a number of mistakes had been made, and to recount some of them may help some of you to an easier accomplishment of your own efforts. In the first place, the bath is not an ideal tank in which to try making microfilm. For a start, to get any depth of water to work on means an appreciable quantity of liquid in the bath, with a large surface area. Presumably owing to surface tension on the water, a film would spread almost the full length of the bath, but seemed to jib at widening enough to cover the sides of the frame. By wedging a couple of wooden strips across the bath at surface level, the lengthwise spread of film was controlled; but, no matter what was done, the side to side width could not be increased. (It is surprising how narrow the average household tub is when measured near the bottom.)

The only solution was to narrow the frames, which



" . . . went bonk! ".

was not encouraging, as the wing chord was fairly wide, and at least three inches of film is required either side of the wing skeleton to allow of easy covering.

Temperature of the water was also a difficult point. While not requiring hot water for successful working, cold water chills the solution too quickly and prevents an easy formation of film, leaving it thick in the middle and too thin for safety at the edges. The usual type of porcelain-metal bath takes a surprisingly long time to heat up, and you will find that by the time the water has settled to a dead calm for working on, the cold bath will have reduced the temperature of the water very considerably. For this reason it is best to pour in quite hot water and commence work when the stuff has cooled down to the required heat—generally around 60°—70° F.

For easy working—and, believe me, it is far from easy to keep a steady hand when bending into a bath-tub—a specially constructed tank is an asset. One with dimensions of 3 ft. by 2 ft. by 3 in. in depth is ideal, and it would pay any club to have one among its equipment. With a tank of this description work can be done at table height, with more than one advantage. (I remember one occasion when, bent double over the bath, and carefully removing a sheet of film from the water, my feet slipped one way and I went the other, catching my head a resounding " wonk " on the far side of the tub !)

Just one tip when using a " table tank." Have a bucket handy in which to tip the water when finished—it's no easy task to carry a full tray like this to the sink ! It's a well-authenticated case of " If the mountain won't go to Mohammed. . . . "

Having got the water question right, the next things I pottered about with were suitable frames. At first I was unable to get the recommended aluminium wire, and contented myself with some $\frac{1}{8}$ in. diameter plated wire. Made up into frames about 18 in. × 9 in., these seemed O.K. until I actually tried them. At first I used the American method of placing the frame in the water, then pouring the solution, bringing the frame up to the underside of the film and picking off.

This was successful in most cases, but I found that, with the plated wire wet, the film tended to slip off the frame as the sheet was being lifted, and I looked round for some way to eliminate this tendency. After much thinking—an effort at any time, I assure you—I tried coating the frame with ordinary rubber solution such as is used for mending punctures in bicycle tyres. This did the trick, the inherent tackiness of the coating keeping the film put under all conditions.

However, on being able to construct some new frames from aluminium wire, I find these much better, being lighter in use, and the natural texture of the metal causes the film to adhere quite well. On thinking the thing out still further, I came to the conclusion that one could just as easily place the frame on *top* of the film as underdeath, and, with the frame being dry, better adhesion should follow. This proved correct, and it is now my usual practice to lower the frame on to the film, gather the surplus to the edges, and lift.

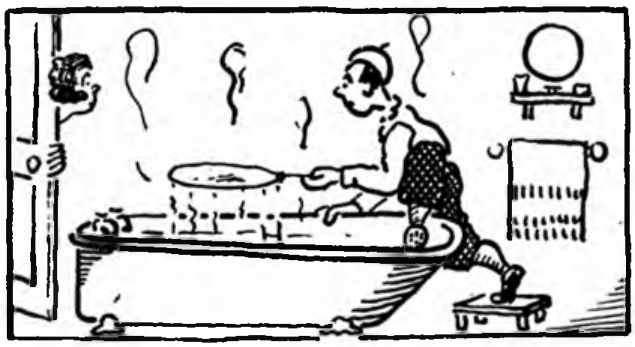
Lifting the film from the water presented many difficulties until the knack had been acquired, but, of course, the film had to be made first, and I had quite a lot of fun getting the right mixture, quantity, etc. After messing around trying to handle the tin lid full of solution, I pinched one of the kitchen teaspoons and improved the technique immediately ! About half a teaspoonful of solution is sufficient to make a decent sheet of film, but this again depends how you drop the stuff on to the water. To let the liquid fall with any force forms blobs, and I found it best to hold the tip of the spoon about half an inch from the surface, and, as soon as the solution touched the water, draw the spoon along sharply, leaving a streak of solution for about the length of the frame. To move slowly at this stage is fatal, as the film spreads very quickly and will race the fall of the solution, producing an uneven film.

One thing is essential when pouring the solution. Make sure that the surface of the water is dead calm, otherwise the film will wrinkle and refuse to spread evenly. Dripping taps should be cured by wrapping with a cloth, and the overflow " bunghole " stopped up—(but don't use the family loofah to do this !)

Having allowed the film a minute to set a bit, lower the frame gently on to the film, and, being careful not to dip the frame under water, gather the surplus material to the edges of the frame. Do this with the free hand, but be sure that the fingers are well wetted, otherwise the film will stick to your hand—and the darn stuff is not easy to remove under such conditions.

Lifting presented many snags until the correct procedure had been mastered, the worst trouble at first being the slipping of the film at the last moment, leaving a

stringy-looking mess round the edges of the frame. Practice showed that the best method was to gently lift the far edge of the frame from the water, and with the frame tilted at a shallow angle, to " slide " the film off the water with an easy and gentle motion. Care must be exercised at the last moment of contact, when a definite break with the water is made, as the surface tension is quite considerable at this point. Be sure that the frame does not dip below the surface, as water on top of the film will cause a break owing to the weight. Tilt the frame to an almost upright position, and ease the frame up until the wire only is resting on the water, then gently lift the whole.



" having . . . got some sheets made."

It is a fairly simple matter to vary the thickness of the sheets of film, and is accomplished by varying the amount of solution poured on to a given area of water. Thin films are useful for tail surfaces, while thick films are best for fuselage covering.

Having, with much sweat of ye brow, succeeded in producing some sheets of " bubble-stuff," hang the frames up in a warm spot, away from draughts, and let the water thoroughly dry away. This is rather important, as a draught, or cold room, will tend to make the film " blush "—or, in other words, take on that milky, anæmic look that occurs when using ordinary dope in a damp atmosphere.

Remember that a number of films are required to cover one model, and I found that for my first model I required five in all : one for the tail-plane, one for the fin and three for the wing. As it is not possible to cover the wing when assembled with dihedral angle, it is necessary to build the wing in two or three sections, according to whether ordinary dihedral is being used or polyhedral, and cover separately.

Well, having got some likely-looking sheets of film made, the next thing to do was get said beautiful " nothingness " in its rightful place on the model framework. And here came the fun ! The only method I knew was culled from an American magazine, which instructed to dampen a flat board, lick the edges of the framework with the tip of the tongue, place frame on board, and drop the film on top of the lot, afterwards burning the section out of the middle with a hot wire.

I still find this method the easiest to use, but have given up the hot wire idea for a dissolving stunt with a fine brush dipped in dope thinners. When the film is placed over the wetted frame, blow all round the edges, when the film will stick to the damp board, and tighten down to the edges of the work to be covered. Give the job two or three minutes to get set, then dissolve the portion from the middle of the film, keeping the brush at least $\frac{3}{8}$ in. away from the framework. The surplus left will curl back to the frame, and can be nicely smoothed by running a wet finger all round the edge. Be very careful when lifting the section from the board, as it will stick in parts, and any attempt to rip it up will most likely rip the covering also !

When I was covering my first model I picked a time when the wife had gone to the pictures ! Prevention is better than cure, tha' knows. I had just got the parts nicely covered when the wanderer returned, and, breezing into the room, created a draught that wafted all my lovely wing sections, etc., all over the place. With a cry of " Please be a little more careful, my sweet "—or, words to that effect !—I proceeded to collect the remains and inspect for damage. Luckily, the negligible weight of the parts had prevented them from coming to harm, and peace was restored !

With the covering completed and the model rigged, the next thing to do was carve a suitable propeller, and did I have fun doing that ! Propeller carving has never been one of my best accomplishments, and, apart from special models like the " Wakefield," where the regulations demand a home-produced article, I have invariably bought my propellers ready-made. However, seeing that no supply shop sold the type of wafter needed for the model under construction, I got down to making one myself.

Taking a light blank, I carved what I thought was a beautiful thin specimen, but, on weighing same, found the darn thing weighed nearly as much as the rest of the machine put together ! The trouble when working on a type of model never before contacted is that one is too bound up with old, outdoor ideas and methods, and I found myself getting windy every time I used a piece of material that looked as though it would snap if looked at. However, I suitably sanded and lightened the article down to a mere fraction of its former weight, and balanced as near as possible.

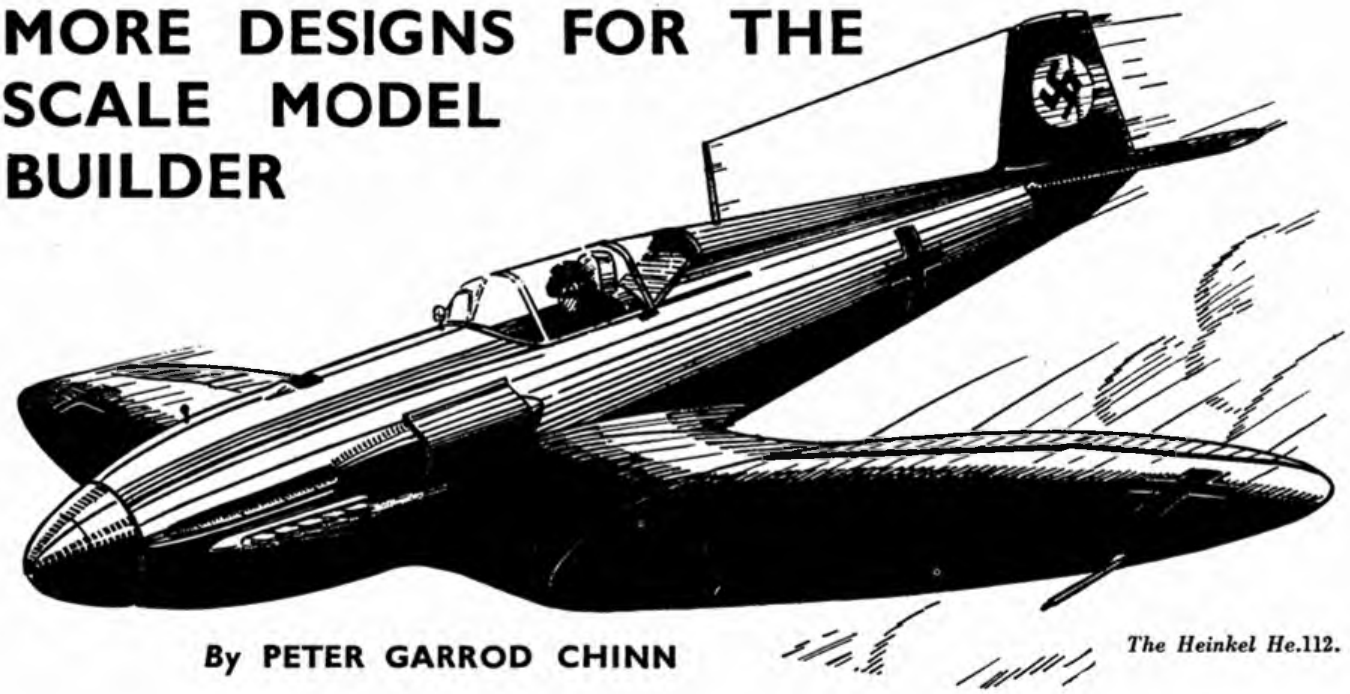
Having been stumped at various times owing to having failed to provide a spare propeller, I decided to make a second article, but, having had enough of carving to paper thinness, I knocked up a quick, and, as it turned out, quite efficient spare by the simple expedient of cutting out two shaped blanks from $\frac{1}{32}$ in. sheet, steaming a nice-looking pitch into them and cementing together at the hub. I have found this type quite satisfactory, and always have a spare propeller of this make on hand.

Having got this far, I was consumed with the desire to see how the thing would fly, but, having no room or hall large enough to carry out such tests, I contented myself with hand gliding it into the dining-room curtains. The trouble was that this type of model seems to take a deuce of a time to assume its proper gliding angle, and before any true idea of trim could be ascertained the curtains had been rammed, and, with a nice long rip appearing in one wing panel, further tests of this kind were promptly discontinued !

The only thing to do was to repair the damage and contain my enthusiasm until the following week, when I had promised myself the privilege of a trip to London and a fling in the yodelling hall of the world's great " tonsil-twisters."

(. . . And did our hero make good at the Mecca of the Modellers? See next month's issue for conclusion of this Soul-stirring Story of the Sinister Skies! Read how the author of " Indoor Antics " achieved his life's ambition . . . in this Epic of (hot) Air!—Ed.)

MORE DESIGNS FOR THE SCALE MODEL BUILDER



The Heinkel He.112.

By PETER GARROD CHINN

THIS month we shall deal with German military aircraft. Although it is generally accepted that Nazi 'planes are inferior to our own, the degree of inefficiency accredited to them is a subject of much debate. For instance, from one quarter we hear that the standard Messerchmitt fighter is capable of well over 350 m.p.h. and very manœuvrable, then from the opposite side comes the suggestion that " . . . at speeds above 250 m.p.h. the Me.109's wings do ' queer things ' and even come off " ! Personally, I don't put much faith in either of these reports, and think that we shall find an answer somewhere between the two—a sort of happy medium.

New German military aircraft first attracted public attention about two years ago, when Dr. Wurster, piloting a Messerschmitt Bf.109, smashed the landplane speed record, held by U.S.A., with a speed of 252 m.p.h., and chalked up a new figure of 379 m.p.h. The Bf.109, the Nazis wanted everyone to understand, was a fighter in wide use with the German Air Force. What they did not make quite so public was the fact that the world record job was a special machine, stripped and fitted with a motor specially boosted to give more h.p. Our " Spitfire " could easily have beaten that record. It should be possible to boost the " Merlin " to give 50 per cent more power, which would push the " Spitfire's " speed up to over 400 m.p.h.

Early last year Nazi aircraft claimed a bit more publicity when the Heinkel He.112U and the Messerschmitt Me.109R both broke the world's absolute speed record with speeds of 463·9 m.p.h. and 469·2 m.p.h. respectively. Again the record-breakers were not standard fighters. Little information is obtainable about either machine, but it is known that both were fitted with Daimler-Benz engines boosted to give nearly 1,700 h.p. Certainly they were both specially built for the record—the Messerschmitt, it is known, was even fitted with smaller wings. Thus these machines can hardly be classed even as modified fighters.

However, it might have been universally accepted that Germany had superior machines had not the Spanish War proved to the contrary. There, Nazi fighters and bombers were continually " coming off second best " in aerial combat, and only when this was known did the controversy really start. Some people who had praised the Germans for their great advances in aviation were unwilling to take the view that all the talk about the German Air Force was so much propaganda. The other side, however, had a strong point in their favour in the Spanish war episodes, and various writers who put forward these statements were, in many cases, backed up by pilots who had actually flown against the Germans in Spain. To this the admirers of the Luftwaffe have argued that at the time of the events in Spain the German Air Force was only just being put on its feet, and that since then the Deutsches Luftwaffe have expanded greatly and that their fighting aircraft have been considerably improved. To substantiate this they remind us that two of Germany's fighters have, " with modifications," flown faster than any other aeroplane in the world.

Not only was the quality of the German 'planes debated, however. Quantity was also the source of much argument. Out of all this arose the great Messerschmitt controversy, which is still raging. The war seems to have intensified the argument rather than settle it, so here, briefly, are a few facts from each side of the case—you can judge for yourselves.

Those who think that the Messerschmitt is a bad aeroplane say that it has been beaten hands down in all dog-fights because it only has four machine-guns; it is not very manœuvrable, and at above 250 m.p.h. gets wing-flutter or loses its wings; and that as a result of this many a French pilot flying a Curtiss " Hawk 75A " can lick three Messerschmitts single-handed !

Now, considering that the Curtisses supplied to the French have only 900 h.p. motors (Pratt & Whitney " Wasps "), are fitted with six machine-guns and armour plating around the cockpit, making them slower than the U.S. Army version, and have a top speed of not more than 320 m.p.h., this looks pretty bad for the Messerschmitt.

However, those who think the Messerschmitt underrated argue that it has a cannon (shell-holes in the wing of one of our bombers to substantiate this), that Professor Willy Messerschmitt is a clever man and would not continue building machines " whose wings came off," that both British and American pilots were privileged to fly the Messerschmitt 109 before the war and declared it to be a fine 'plane; finally, that its speed is at least 350 m.p.h.

The answer to all this is, I think, in the fact that the German pilots have not the skill of the British flyers or the daring of the Frenchmen, and that, as you will see in the following brief description, there is more than one version of the Messerschmitt.

The Messerschmitt (B.F.W.) Me.109 is a cantilever low-wing monoplane of all-metal structure. The first machines appeared in 1937 and were fitted with Junkers " Jumo 210 " motors of approximately 650 h.p., driving fixed-pitch two-blade propellers. They had a large radiator under the nose of the fuselage and were fitted with four machine-guns but no shell-gun. Top speed was about three hundred miles per hour. An improved version, fitted with the Daimler-Benz DB.600 engine developing over 1,000 h.p., was later put into service. This machine appeared with a slightly different cooling system, the large radiator under the motor cowling being replaced by a much smaller one, and two extra coolers being fitted under the wings. Both these types were used in Spain, and there is plenty of evidence that the earlier versions are still in service with some squadrons. This would account for the fact that Messerschmitts shot down in France had no cannon. The Nazis, not being in a very good financial position, are probably reluctant to discard older types. It is most likely these earlier types will suffer from wing-flutter. In all probability, the latest type, fitted with Daimler-Benz DB.601, 1,150 h.p. motor, is not as yet in very wide use.

The DB.601 version is quoted as being capable of 354 m.p.h. at 12,300 feet, and has a slightly " cleaned up " engine cowling with ejector-type exhaust manifolds. The undercarriage is, of course, retractable (except tail-wheel) and appears to be operated through a worm-drive. The tail-plane is strut-braced, and the fin is cambered on one side—evidently to off-set torque. The " cannon " is the 23 mm. Madsen, and fires through the hub of an electrically-controlled three-bladed C.P. airscrew.

Other performance figures are as follows: Service ceiling 36,000 ft., which seems a bit optimistic, considering the high wing loading—although power loading is low (less than 5 lb. per horse-power—33⅓ per cent less than the " Hurricane's " power-loading). Initial rate of climb, over 3,000 f.p.m. Range, 620 miles at 298 m.p.h., also probably an exaggeration. (" Hurricane " does 550 miles at 275 m.p.h., by way of comparison). Landing speed 75 m.p.h. (not so good, considering flaps and Handley-Page slots are used), due to the 31·5 lb. per sq. ft. wing-loading (" Hurricane " has a loading of about 23 lb. per sq. ft. and lands at 68 m.p.h.). Dimensions are: Span 32 ft. 6 in., length 32 ft., wing-area 176 sq. ft., and aspect ratio approximately six.

The Messerschmitt is not a particularly good-looking aeroplane. Its blunt lines make it a striking contrast to that other much-advertised German fighter, the Heinkel He.112.

The He.112, sketched here, is a really beautiful machine; its lines seem to spell speed, manœuvrability and all the factors that go to make a good fighter. There is one thing it does definitely spell, and that's disaster—to the pilot who is not used to handling really high-speed aeroplanes. The Heinkel is a difficult craft to fly and has a frightfully high landing speed, no less than 90 m.p.h. loaded normally. The long-range version (one of which was seen over here some weeks ago) has a landing speed of nearly 100 m.p.h. So if it is true that the latest He.112 is as fast as our " Spitfire," the Germans have only got their speed by building a machine like a racing 'plane and risking their pilots' necks.

The newest He.112 is fitted with the same motor as the latest Messerschmitt, and so they make an interesting comparison. Both have small swing spans, the Heinkel's span is only three inches more than the fuselage length, but it has a slightly larger wing area (183 sq. ft.) and a lower aspect ratio (only 4·86 to 1). Its wings are a perfect double-ellipse, in contrast with its rather square tail-unit. The DB.601 motor is well cowled, and drives a triple-blade controllable-pitch airscrew, the hub of which is encased in a large spinner, which continues the lines of the fuselage almost perfectly. The construction is, of course, all metal. The undercarriage, evidently hydraulically operated, is retractable (tail-wheel included), and now folds inwards into the centre-section (earlier versions had outward-retracting undercarriages, like the Me.109 and " Spitfire "). Previous models also had a slightly different upper part to the fuselage and cockpit. Most photos published of the He.112 show a short streamlined transparent cockpit cover, which looks as though it had been stuck on as an afterthought. This gave the pilot a very good view all round, but has now been replaced by a long fairing extending to the fin, and thus has increased the depth of the fuselage behind the cockpit.

The wings are an " inverted gull " shape, and are fitted with flaps. A 20 mm. shell-gun is mounted in each panel and fires outside the propeller arc. Additional armament consists of twin 7·7 mm. synchronised machine-guns in troughs along the engine cowling, and six twenty-two pound fragmentation bombs.

The Heinkel's climb and service ceiling are not so good as the Messerschmitt's, being approximately 2,760 f.p.m. and 31,170 feet respectively. The weight of the He.112 is given as 5,740 lb. with sufficient fuel for a range of 715 miles, but there is some doubt about this. Either the weight is over 6,000 lb. (which would make landing speed even higher), or else the range of 715 miles only applies when no bombs are carried.

The machine has a span of 29 ft. 10 in. and an overall length of 29 ft. 7 in.

Since these articles will be mainly of interest to the flying-scale enthusiast, the Editor has asked me to give cut-away drawings to illustrate models of machines I have described. This month we present the Brewster F2A-1. I have chosen this machine because there is every chance that we shall be hearing a good deal more about it. Soon after Russia invaded Finland the United States sent forty fighters to Finland that were part of a consignment ordered for the U.S. Navy from the Brewster Aeronautical Corporation. It is almost certain that these machines were of the single-seat F2A-1 type. Recently it was announced that Great Britain was negotiating with the Brewster Corporation for some two million pounds' worth of aircraft. Again it may be assumed that these are the F2A-1 type, or a version of it.

The Brewster single-seat fighter was only briefly described in the December issue, so we shall not be going

over previously covered ground by giving a short description of the full-size machine.

The Brewster F2A-1 is an all-metal cantilever mid-wing monoplane designed for operation from aircraft-carriers. In this capacity it is believed that no other nation has fighters to equal its performance. The prototype was fitted with a 9-cylinder Wright " Cyclone " radial rated at 960 h.p. and developing 1,000 h.p. for the take-off. This is equipped with a Hamilton three-blade controllable-pitch metal propeller. The fuselage is very deep and " stubby," and has a transparent panel in the bottom to permit downward vision. An inflatable boat is carried behind the pilot's shoulders for use in an emergency. The undercarriage retracts partly into the fuselage and partly into the wing. The F2A-1 has an exceptionally fast climb, and its take-off is said to be extremely short, which should make it an excellent machine for interception duties.

The design should reproduce well into a flying model, although one or two alterations would be necessary.

A scale of $\frac{3}{4}$ in. to the foot will give us a model of approximately 26 in. span, which should be quite successful; the model in the drawing is suited to this scale. Fin and stabiliser areas have been increased, as the tail moment is rather short. However, the wing position will enable the thrust line to oppose drag fairly squarely, so there should be no trouble in this direction. The fuselage has been simplified, and would look better if a few more stringers were used, but we must be careful not to add too much structure, as weight must be kept down if good performance is desired. The tail must also be kept light, otherwise weight would probably have to be added to the nose. It is suggested that all parts marked with an asterisk in the key are only incorporated in a detailed model. For instance, an accurate miniature Cyclone motor, retractable landing-gear, movable control-surfaces, navigation lights and a pitot-static tube all help to make an authentic scale model but only spoil performance.

Correction.

Last month's article contained a sketch of the Consolidated Model 31 flying-boat. Owing evidently to a printer's error, the caption to this drawing read: " . . . in use by the R.A.F." This, of course, is not the case. The Consolidated 31 is not yet in use with any air force.

Key to Drawing of Flying Scale Model of The Brewster F2A-1.

1. Movable elevator.*
2. Movable rudder.*
3. Enlarged tail-surfaces, elliptical shape.
4. Transparent cockpit canopy, thin celluloid or cellophane.
5. Sliding hatch.
6. Fuselage: backbone, formers and stringers. Tissue covering.
7. Extra stringers.*
8. Radio mast and aerial.
9. Movable aileron.*
10. Machine-gun ports.
11. Detachable nose-block.
12. Flying-type propeller.
13. Balsa cowling. Dummy " Cyclone " motor.*
14. Undercart retracted.
15. Extended position for undercart.
16. Wing walk.
17. Box-type balsa wing spar.
18. Dummy pitot-tube.*
19. Dummy navigation light.*

YES! MR. BEARD

MAY I start by saying that I perfectly enjoyed reading your article, " Has it Ever Stuck You? " in the January issue, and would like to carry your revelations a step farther.

I have been modelling since June, 1938, and for this period I can show only one finished job, " A Flying Scale Heston Phœnix," the drawings of which were given in an issue of THE AERO-MODELLER of that time. The first real flight smashed the undercarriage, and I then made a more substantial one.

This modified version has made about 15 to 20 flights, and at least three of these topped the minute. However, it isn't my nature to stick around flying one model, and I felt the urge to make a 10 ft. model. This was March, 1939.

My first thought was the " Tipsy " two-seater low-wing monoplane, but I eventually discarded that idea and started on the " Skua." I was lucky to get hold of some line drawings, and as these were one-eighth scale and would make a model of 80 in. span, I did not bother to increase the scale. Going all out with the drawings, on the back of some wallpaper, I made great headway, and by May I had the fuselage centre section and one half of the undercarriage, together with one wing in the rough state.

At this point I was delayed—not, like Brother Beard, " because I went rambling on Sundays," but because I bought a car. On one of my Sunday runs I came across " The Bradford Model Club " on Baildon Moor, and, of course, put the car on the side of the road. There were a good number of models in the air, mostly duration jobs, all rubber driven, except one. I just heard the " phut, phut " of a two-stroke, which made one bolt in the direction of the noise (music to me).

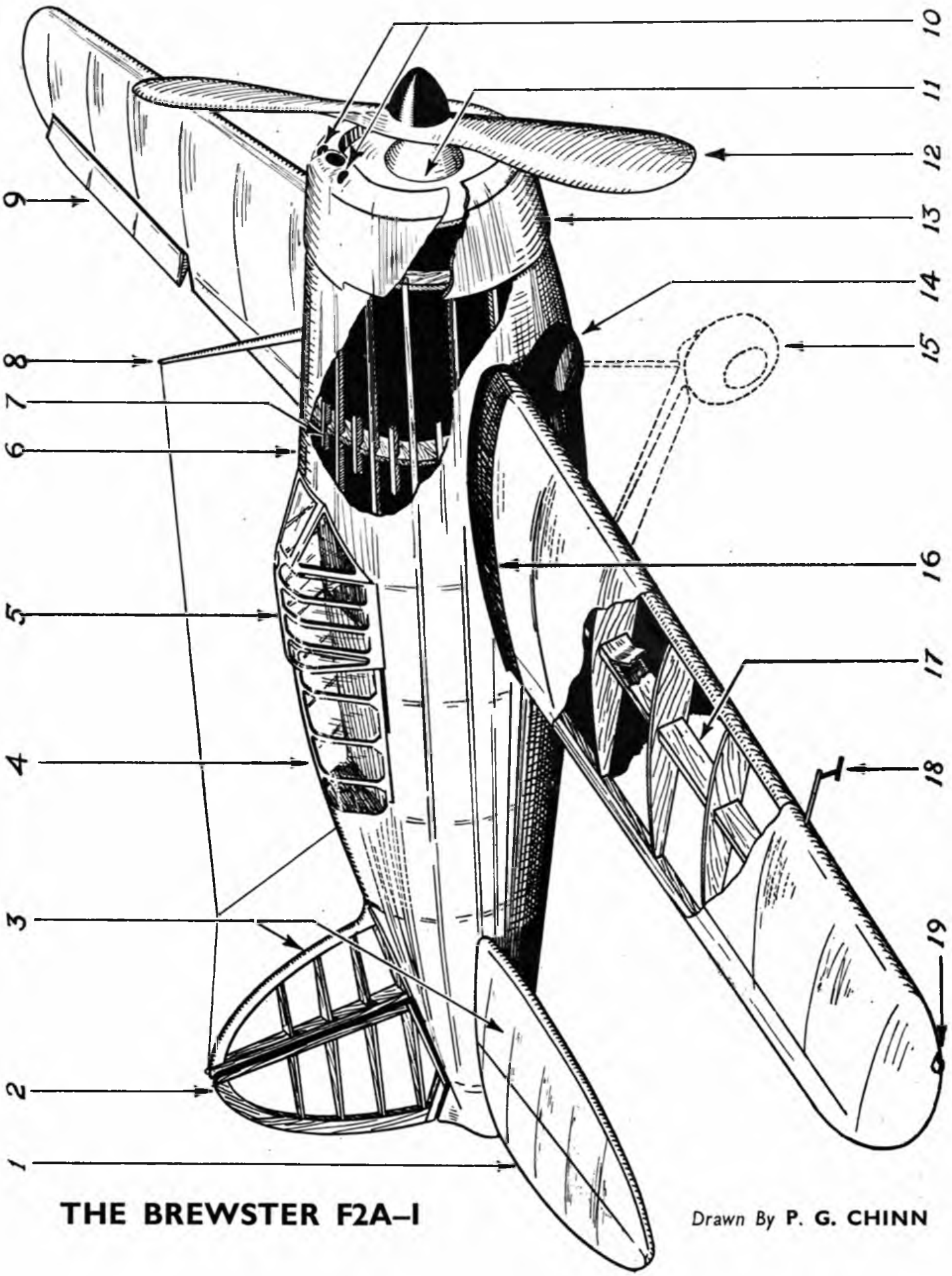
When I managed to edge my way through the crowd I was rewarded by seeing a 6 ft. gas job just warming up. Oh boy, can you imagine the excitement, with the owner looking very worried, as most power men do before a flight, shouting for elbow room?

The seething mob were eventually parted, and a somewhat narrow runway was made. With one mighty roar the 'plane surged forward and took off without mishap. I stood gazing at the apparition, the first gas 'plane I had seen. It reached a height of 20 to 25 feet, then banked to turn down wind. It was moving very well by this time and was making straight for the line of cars. The worried owner, on seeing this, just leapt into the air and made frantic attempts to beat the 'plane to the cars. Alas! fate was against him, and the undercarriage hit the roof of a car with a resounding smack. I stood for several minutes as if in a trance, perhaps in respect for the bereaved owner, but I was soon cheered when I saw him retrieve the model, to find that it had only suffered a broken undercarriage leg.

I went back to the car full of admiration for the spirit this modeller showed, and with the cheerfulness with which he started to repair the job. It was with this in mind that I started thinking on lines of remote control. Although I was not actually building during this period, I was sorting out the knotty problems, such as retractable undercarriage, controllable elevators, rudder and ailerons.

Being fortunate enough to have as a workmate a certain Mr. Garland, of Shipley, who is an expert on wireless and its wonders, the remote control idea is being sorted out, and perhaps towards the end of the year the " Skua " will be air-borne, with the elevators, rudder, aileron, undercarriage and flaps in full control of the operator on the ground.

NO! Mr. BEARD, you are *NOT* nuts!



THE BREWSTER F2A–I

Drawn By **P. G. CHINN**

HOW TO MAKE A
Solid Scale Model of the Handley-Page "Hampden"

$\frac{1}{8}$ in. to the foot scale = $\frac{1}{96}$ full size

By A. W. HUMPHRIES

The Editor offers a prize of **10s. 6d.** *cash for the photograph of the best-looking model received at "The Aero-Modeller" offices by March* **31st.**

Fuselage.

OBTAIN a block of balsa wood 7 in. by $1\frac{1}{4}$ in. by $\frac{1}{2}$ in. Transfer the side elevation of the fuselage on to the wood, and cut out with a razor blade or fret-saw. Repeat this procedure with the plan. Now, with rough sandpaper, begin to shape the fuselage as shown in plan, making frequent references to the templates.

Finish off with fine sandpaper, and give two or three coats of dope, sanding in between each coat until a smooth surface results.

Wing.

A piece of balsa 9 in. by 2 in. by $\frac{1}{4}$ in. is required for the wing, which is made in one piece. Shape the section with a sharp knife, and finish with sandpaper in the same way as the body. Note that the dihedral starts some way out past the engines. Make a deep cut at these points and bend until the desirsed angle has been obtained. Then fill in the gaps with cement and allow to dry. Cut pieces out of the wing in positions indicated on plan to accommodate the engines.

Tail.

The tail is made in exactly the same way as the wing, but there is no dihedral. It is cut to shape from $\frac{1}{16}$ in. sheet and sanded to a streamline section, as are the fins and rudders.

Engines, Nacelles, Etc.

The nacelles are made from two pieces of balsa, $1\frac{1}{4}$ in. by $\frac{1}{2}$ in. by $\frac{1}{2}$ in. They are rounded in cross section and are symmetrical, so should offer no difficulty. The engines are made from pieces $\frac{1}{2}$ in. by $\frac{5}{8}$ in. and are self-explanatory.

Assembly.

With a fret-saw, cut out a section of the body as shown on plan, identical with the airfoil shape. Slide the wing through, and when satisfied that it is quite true, firmly cement. Next cement the nacelles in their proper places in the wing. Affix the tail with great care, ascertaining that it is true with regard to the wing. Use plastic wood to fair all the joints and complete a good job.

If the model is desired for display only, it will be better to have the wheels retracted. In this case, the covers (see "X" on plan) will not be required. Cut as shown on plan. Fix aerial as shown, using thread for antennæ. Cement engines firmly in position, seeing that they are both true.

Finish.

Give the whole model another coat of dope, and sand with fine paper. Then paint with camouflage dope as shown on plan. Paint the windows with grey paint, marking the window frames with indian ink. Mark in the ailerons, elevators, etc., also with indian ink. Affix cockades as indicated on plan. Paint the whole of the under-surfaces with dull black paint and paint the numbers in white.

The cooling gills on the engines are painted grey, as are the exhaust collector rings. The exhaust pipes are black.

In Conclusion.

If these instructions have been carefully observed, the resulting model will be an exact replica of its "big brother."

SCALE BLUE PRINT GIVEN FREE WITH THIS ISSUE

LETTERS TO THE EDITOR

DEAR SIR,

I read with interest " Clubman's " quotations and comments on the trend of American petrol model design, and heartily agree with him that we do not want the type of model which the competition rules have forced the American designers to build.

On the other hand, these over-powered balsa crates do perform their antics in the air, as flying machines, whereas we know only too well the antics of the British machines on the ground in their efforts to fly. The October, 1939, AERO-MODELLER reports that 50 per cent of the Bowden competitors failed to get off, " owing to lack of wind "! This, mark you, in Britain's major competition.

When Mr. D. J. Miller described his very fine " Hurricane " in the May AERO-MODELLER, he perhaps unknowingly gave us a line of thought on these Bowden failures. He states, page 352, that " machine weighing . . . 6 lb., and a 6 cc. engine will take care of that." This statement has so far caused no comment, although it means a power-weight loading of 36 lb. per H.T.

I feel that a reliable and consistent model cannot be built on these lines, and have witnessed many disappointments and crashes on under-powered, fast-moving models.

The American models criticised by " Clubman " have a power-weight loading around 7 lb. per h.p., and often the static thrust from the propeller exceeds the total weight of the machine. I class these machines with microfilm jobs—novel and cleverly constructed, but not real flying.

What, then, is required for British conditions? May I offer the following two points for consideration and discussion, feeling that they are essential features for building a successful, reliable and consistent model?

A. Power-weight loading not to exceed 20 lb. per h.p. This will allow reasonably rugged construction with strong take-off and climb.

B. Wing loading not to exceed 12 oz. per sq. ft. (less if possible). This will give a slow glide and landing speed.

Knowing that competition rules govern design, originality, workmanship and real flying should be taken into account to find the winner. That relic of rubber competitions—duration—has no place in a petrol competition.

Wishing THE AERO-MODELLER every success.

Yours faithfully,

Hayes & Dist. M.A.C. A. H. WILSON.

DEAR SIR,

Allow me to congratulate you upon publishing the very invigorating article by Mr. C. A. Rippon entitled " By Effort We Achieve! "

I was particularly interested in his reference to the possibility of aero-modelling being taken up by military hospitals, etc., to while away the long hours of convalescence.

It was my good fortune to witness a little of the good that can be done in this way. Last year I had occasion to visit a friend of mine in Winsley Sanatorium, near Bath (curable tubercular patients), and saw the birth and growth of their model aeroplane club.

A chance remark by some visitor aroused interest, four small kits of flying models were bought, back numbers of THE AERO-MODELLER studied, and the thing was a success. They have been hard at it ever since.

An outstanding feature was the strong support of the doctor in charge. As " occupational therapy " or healing, he was all for it. I suppose the idea is that if you are busy making something that you have got to get well enough to go out and fly you have a much better chance than if you just sit about thinking how bad you are!

I hear that the Bath Club paid a very welcome visit to Winsley this summer with models.

If you should have any part in starting such a club, be sure that the first models are small, easily made and fly well when made.

A ready-made model in flying trim would be a good way of showing what can be done. As Mr. Rippon so truly says, the " greatest opportunities " are ours—*now*.

ARNOLD WATHEW.

DEAR SIR,

I have just been reading your Editorial in THE AERO-MODELLER, and, seeing your paragraph on a review of articles in this book, I thought of forwarding the following suggestion, which has been buzzing around in my head for some time.

My suggestion is this: Why not have a " Swap Market? " By this I mean, not a page of advertisements, but a page where readers can announce what they have to swap, and what they require in *exchange*.

This would help those modellers who find it impossible to join a club. It is very hard for these " lone wolves " to borrow plans (I know, because I am a lone wolf myself), and therefore the hobby becomes rather expensive, whereas in clubs members can easily swap plans and many other odd pieces of model material. This " Swap Market " idea is not an original idea, but as it has met with roaring successes in other books, why should it not be a success among aero-modellers? Below are some rules which might be useful should you give this suggestion further consideration.

" SWAP MARKET " RULES.

1. All swaps must be sent in with two (or three) " Swap Market " vouchers cut from consecutive numbers of THE AERO-MODELLER.
2. " Swap " notices must not exceed 30 words, including name and address of advertiser. (This rule will help to keep the space taken up by the " Market " moderate.)
3. Arrangements for transportation of swaps and all correspondence must be made between the swappers.
4. Swappers should correspond with each other before sending swaps, to avoid muddles.
5. Articles for *sale* and requests for charity should not be published.
6. The Editor can refuse to announce any advertisement if he wishes.

If a " Swap Market " was started in THE AERO-MODELLER it would help not only " lone wolves " but also club members and overseas aero-modellers. I do hope you will give this suggestion your careful consideration and not throw this letter in the fire, as I am sure it would be a great advantage to all modellers.

Yours faithfully,

KENNETH GREGORY.

We invite readers' views on this subject. It is referred to in this month's Editorial.

Was first published two years ago, and was well received by the Press and Aero-modellers. The edition was soon sold out, and during the past nine months hundreds of orders have been turned away. Now the book is again available in an improved form.

The technical chapters have been re-edited and entirely reillustrated. The chapters on construction have also been re-edited so as to deal with the latest practice in model aircraft construction. The book is printed on fine art paper, thread sewn, and bound in full cloth with stiff covers. There are over 250 pages. Size is 8½ in. by 5½ in. The dust cover is printed in full colours.

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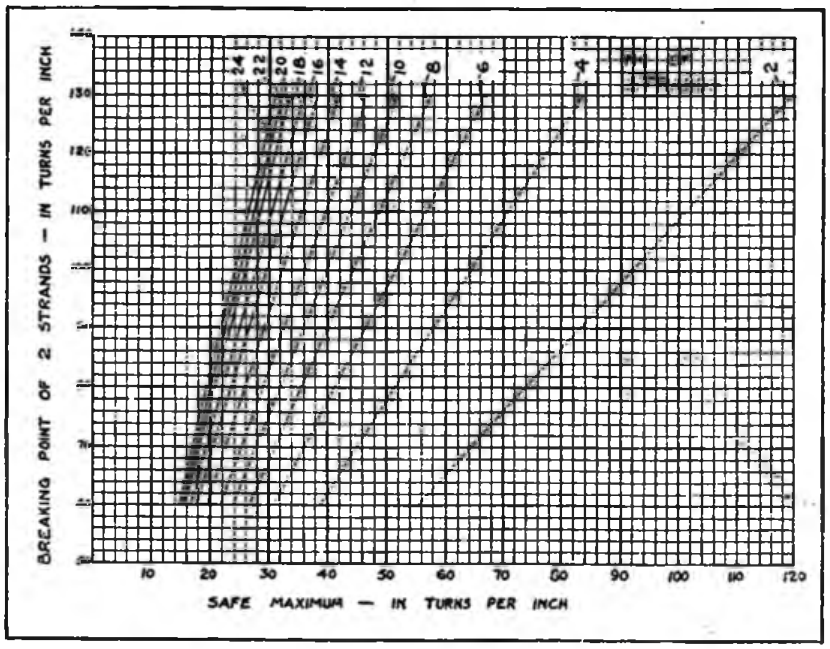
HOW TO GET THE MOST OUT OF YOUR RUBBER MOTORS

By J. H. MAXWELL



MOST aero-modellers have their share of breaking motors, and it was after a particularly bad spell of these that the Research and Experimental Section of the Glasgow Model Aircraft Club decided to carry out some tests on rubber, from which some very interesting and useful data was obtained. The object of this article is to pass on to other enthusiasts the conclusions we came to regarding the problem of how to treat rubber, so as to get the most out of it.

Storing.

When not in use, the rubber should be stored in an air-, light- and dust-proof tin or cardboard box. It must not be wound tightly or crushed in any way.

Washing.

Before returning the rubber to its box after use it is advisable to wash it carefully in cold water. The surface moisture may be dried off with a trowel, after which the rubber should be hung up loosely in a cool, dust-free room. Such aids as heat or sunlight must not be used to hasten the drying.

Lubricating.

The rubber should be made up into its motor form and lubricated with any good brand of lubricant several hours before it is required, and, while it is not desirable to have the motor dripping with lubricant, sufficient should be applied to cover every strand, and it should be well rubbed in.

Prewinding.

New rubber requires to be " run in," and this is done by giving the motor two prewinds of 75 per cent and 90 per cent full turns. Full turns may be given on the following winds, but the first one or two full turn winds will produce more power than subsequent ones, and therefore may stall the model.

Winding.

The following winding procedure should be carried through very carefully.

(1) Make sure that the model, winder and the person holding the model are ready and able to take the strain.

(2) Walk backwards until the motor is stretched to five times its normal length. Do not guess this distance, measure it beforehand.

(3) Without coming in, wind in half the turns, and then start moving slowly towards the model, judging the pace so that at the final turn you are right up to the nose.

In tests it was found that even a slight variation of the above procedure, such as coming in a little too slowly, was sufficient to break the motor well short of full turns.

Turns.

It is always a problem to know how many turns a motor will stand; however, although the usual formula for finding this is not sufficiently accurate, the method explained below can be used with confidence.

Unfortunately it involves a little trouble, as, to be really accurate, it is necessary to test each batch of rubber. This may be minimised if several modellers buy their rubber together, then one test will cover the lot.

Six two-strand loops are made up, which may be any suitable length, such as six inches, but it is important that they should all be exactly the same. These are lubricated and left for a few hours.

After this time the first loop is attached to a hook in the wall, and then, employing the correct winding procedure, it is wound until it breaks. This breaking point will serve as a rough guide for the others.

The remaining five loops are now given two prewinds of 75 per cent and 90 per cent of the turns at which No. 1 broke. To save time, the five loops may be put together and prewound as a 10-strand motor; but, of course, the number of turns must be reduced accordingly.

Having been run in, each loop is taken separately and wound until it breaks, and the average breaking point is taken. If everything has been carefully carried out, there will be no great variation in the breaking points. We had examples of as many as four out of the five loops breaking at exactly the same number of turns.

By dividing the breaking point by the length of the loops, the average breaking point in turns per inch for a two-strand motor will be obtained, and from this, by

means of the graph, the safe turns on any size of motor may be found.

Those who require only approximate results, can take our word for it that the average breaking points for the most popular British makes of rubber are 110, 90 and 70 turns per inch for two strands of $\frac{1}{8}$ in., $\frac{3}{16}$ in. and $\frac{1}{4}$ in. respectively.

The method of using the graph is more or less self evident, but an example might be helpful.

Test pieces are taken from a batch of $\frac{1}{8}$ in. rubber, and the average breaking point for two strands is found to be 110 turns per inch. From the same batch a 12-strand motor is made 30 inches long. Take 110 on the vertical scale and follow it along to the 12-strand line, then read off from the bottom scale, and the answer is 39·5 turns per inch. Multiply this by the length, 30 inches, and the result is the safe number of turns for the motor =1,185.

BALSA-WOOD BIOGRAPHY

IT is in the wild depths of a tropical South American forest that the Ochroma Lagopus—or more simply, the Balsa tree—begins its life.

The name " balsa " is a Spanish word meaning a " raft " or " float." The tree is native to tropical South America, and in appearance it is similar to the North American cotton tree.

From a slender sapling the tree grows rapidly, and in due course, when it is fully grown, it is cut down and shipped abroad.

In order to make the timber workable and reliable the water content (50 per cent—200 per cent in freshly felled timber) has to be reduced to less than 20 per cent; the reduction has to be made in a manner which will not cause damage to the structure of the wood. Formerly the most favoured method of seasoning was " natural evaporation "; but to-day the forced methods, involving the use of hot air, steam, electricity, etc., in specially-designed drying kilns, are proving more satisfactory.

After seasoning, balsa weighs on the average 7—8 lb. per cubic foot, which is only half the average weight of cork; it is the lightest of all the known timbers.

Because of its extreme buoyancy it is used successfully for floats, life lines, and preservers.

Its elasticity renders it useful as a shock-absorbing material, and to this end it is used as foundation pads for machinery.

Together with these properties it is also an effective insulating medium. Consequently, it is used for lining incubators, refrigerators, and cold storage rooms. Its insulating properties, combined with its lightness, make it especially useful for containers in the transportation of dry ice.

It is also used in passenger compartments in air-liners.

The model field of aernautics, however, has probably the most substantial claim to balsa wood. The replacement of birch by balsa, with the consequent reduction in weight, was responsible for the great advances made in the last few years.

Although, at present, it is difficult to always obtain the exact grade required, the builder is at an advantage if he knows where to use the various grades, which are distinguished by grain characteristics.

The long straight grain of uniform texture is best used for tubular construction and for covering, as it bends quite easily. In contrast to this is the grade with a " figured " or " scollopy " appearance. It will not twist or buckle easily, and is consequently best used for wing-ribs, formers, etc., where a stiff structure is required. Sheets of this grade will simply snap if any attempt is made to bend them.

The grades usually stocked by supply stores are a compromise between these two extremes. The best the modeller can do is to select the grade most suited to his requirements. For propeller blanks quartered material (i.e. cut radially from the centre of the log) is most desirable. Looking at the block end on the annual rings should run either parallel to, or at right angles, to the shaft; this will facilitate carving and balancing the propeller.

Finally, a few words about colour streaks which seem to worry some builders. They occur most frequently in the softer grades of balsa, and are due to the open grain which allows the sap to carry fine, mineral colour sediments into the pores of the tree. The strength of the wood is not impaired in any way, since these sediments cause no damage to the fibres of the timber. Consequently, there is no reason for diffidence in the use of such colour streaked sheets in model building

DESIGNING

By G. HEIGHTON

THIS article is written with the express purpose of shocking those so-called experts who argue furiously about C.G., wing loading and wing sections, etc.

I have only been building for a few months; in fact I am nothing but a novice. But I have just built and flown a 'plane of my own design.

It happened this way. One evening, having nothing particular to do, I decided to design a 'plane! So, after procuring the biggest sheet of drawing paper I could find, I started. I decided to have a rectangular fuselage, that being the easiest to draw. I made the body as long as the paper, with plenty of bracing in the nose (my models seem to take a delight in nose diving). Having built the fuselage, which was 20 in. long, I started on the wing. I made it 40 in. span and of equal chord all the way through. The ribs were easy—just a nice curve, tapered off to the back. The tail unit was child's play, and after a few more touches I considered it ready to build.

It proved easy to build. I put the finishing touches to it about three weeks later. Surveying the finished job, I felt quite proud of it. The colour scheme was yellow fuselage and fin with red wings and elevators.

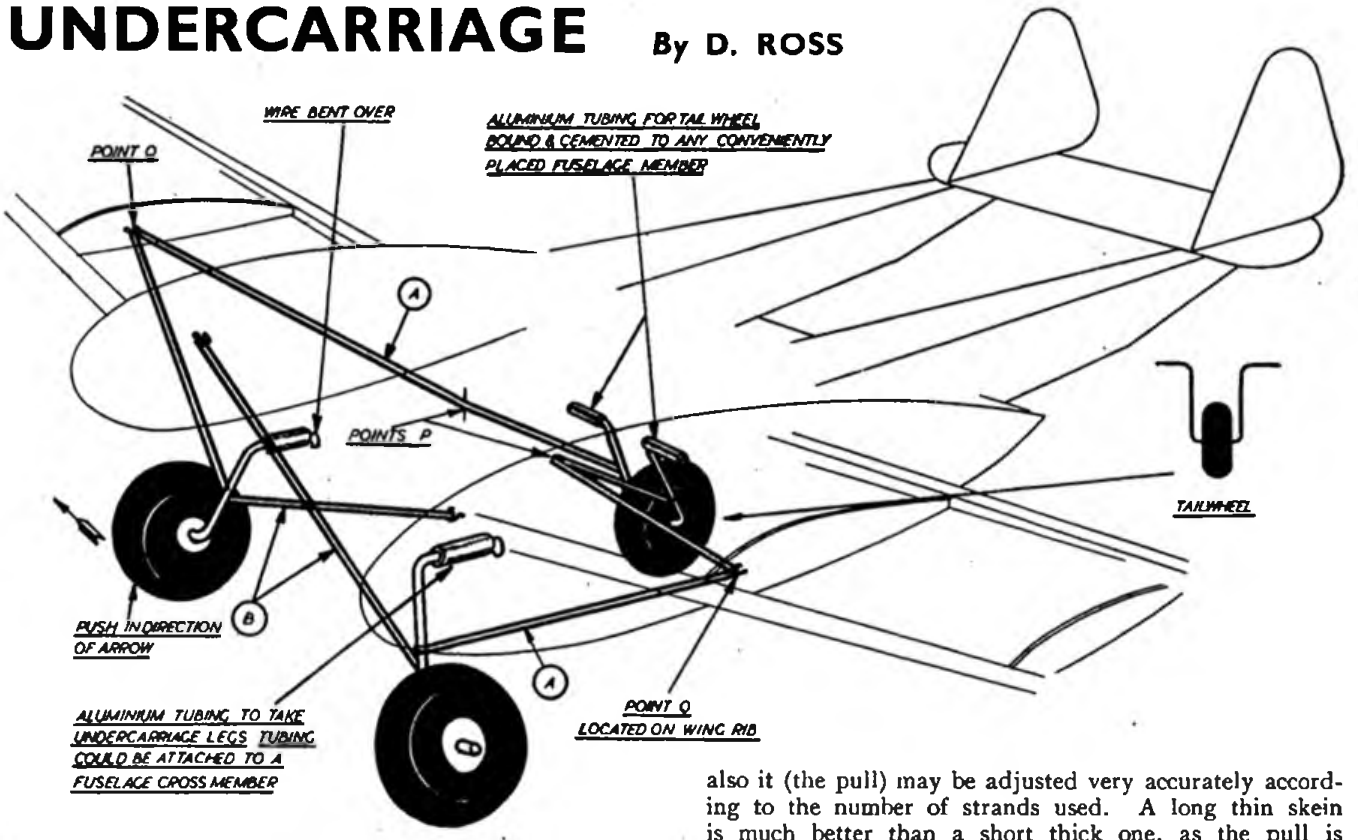
So I sat down to wait for a decent flying day, and the weather promptly obliged by raining for a fortnight. But at last a day dawned which promised to be ideal for flying, so later in the day I sallied forth with all my paraphernalia.

After much gliding and correcting a tendency to stall, I wound up the motor, c-a-r-e-f-u-l-l-y putting on about 650 turns. The 'plane exceeded all my expectations, flew in large circles for about 2½ minutes.

I have since had some remarkable flights with my craft. So think about that you blokes who argue over unexplainable technicalities.

A SIMPLE RETRACTABLE TRICYCLE UNDERCARRIAGE

By D. ROSS



THIS undercarriage, which has both the advantages of being extremely light and also very simple, is useful on a twin fuselage model. The three wheels retract simultaneously as soon as the weight on them is relieved, and not before (we hope). If difficulty is experienced here, the rear wheel may be pushed farther back, or the front wheels farther out, as shown in Figs. 1 and 2. I find that the thin elastic wound round a golf ball is the most suitable for our purpose, because not only will it stretch very far with an even pull, but also it (the pull) may be adjusted very accurately according to the number of strands used. A long thin skein is much better than a short thick one, as the pull is longer and more even.

When the model is taking-off, the rear wheel is being forced backwards by the ground, until the machine is air-borne, when th pull on the thread A (from elastic B) draws it forward and up. The front wheels may be made to retract inwards or outwards, whichever is the most convenient.

Once the undercarriage is properly adjusted, the pull of elastic (B) not too strong, etc., it is very reliable, and should never fold up too soon or too late (or never !)

MORE DEFINITIONS

By C. A. Hawkes

Airscrew.—A propeller with a superiority complex.

Concours d'Elegance.—A competition to decide which 'plane possesses the best steering qualities. Prizes are given to owners of those which have successfully steered clear of trees, dogs, etc.

Cup-washers.—The married members of the club.

Dope.—A liquid used to shrink tissue, etc. In order to make it more pleasant to use it has now been artificially scented with a pear-drop smell.

Glider Tow-line.—A thread stretched across the flying field in order to trip up unsuspecting people.

National Guild of Aeromodellers.—Now affiliated to the Greenhouse Owners' Benevolent Society.

" *Own Design.*"—An expression often applied to a model aeroplane. Usually taken to mean that the 'plane in question has been made up from the odd parts of several old models.

Pole-flying.—A sport introduced during the trade depression by the British Glaziers' Association.

Rubber Lubricant.—A liquid sold in tubes specially made so that when the tube is squeezed in the middle the contents squirt from the bottom.

Telegraph Wires.—A form of balloon barrage for model aeroplanes.

Ten-gauge Wire.—A substance which cannot be cut, twisted or bent.

Timer.—A device fitted to petrol models to stop the engine when approaching a greenhouse or other promising target.

Trees.—Planted round fields to prevent model 'planes going too far.

Washed-out Wing Tips.—Found on seaplanes which have failed to pass their flotation test.

Winding-hook.—A wire hook soldered to the front of the propeller shaft. Used for excavating.

SOLID SCALE

By J. H. ELWELL

Solid or full size?————THE GLOSTER

IN introducing this new series of articles I feel I am meeting the wishes of many of our readers. I believe that our journal has a large percentage of " solid " fans, and since the war interest in military models of this type has greatly increased.

I hope in future articles to be able to refer mostly to reader's solids, and to illustrate the article with photographs of their models.

The photographs must be realistic, sharp, and preferably of postcard size. With your help, therefore, I hope to make this series of articles one of the most popular and eagerly awaited in THE AERO-MODELLER.

It is up to you " solid " fans, so don't fail to write to me at the offices of THE AERO-MODELLER and tell me the most interesting facts about your models, and enclose photos of them, too.

I intend to deal with the subject of photographing your " solids," but here I should like to point out that most photos we receive are spoilt by lack of ingenunity and thought on the part of the photographer in erecting a decent background.

Amazing results can be obtained using a Brownie box camera, either indoors or out, provided attention is given to this.

My first models were constructed ten or twelve years ago, when there was no AERO-MODELLER with its fine plans and hints. I thought myself rather a pioneer, and regret to say that I made a great many mistakes compared with the aero-modellers of to-day.

However, the experience certainly stood me in good stead, and to-day a " solid " model provides me with little difficulty.

Photographs of some of my first models illustrate this article. They are some of many constructed entirely without plans of any kind!

What I used to do was this. I perused *Flight* and *The Aeroplane* until I had sorted out all the available pictures of the model I wished to construct. I studied these and kept them by me for reference, and thus obtained a good " eye picture " of the machine I intended to make.

My materials were mahogany, deal, and sometimes pine, as in those days balsa was but a sweet dream. I did manage to put quite an amount of detail into the models, as you will see from the photos.

My enthusiasm grew, and my workmanship improved with it.

I constructed about 17 models before the balsa "solids" started to appear on the market.

Bristol " Bulldog," Handley-Page " Heyford," Boulton and Paul " Sidestrand," Hawker " Fury," and several of the old war-time types comprised my collection, of which I was justly proud.

The " Heyford " had hand-carved wheels and spats, dummy bomb racks in the bottom wing centre section, retracting and rotatable gun turret, with a movable machine gun, movable machine guns aft of the wings and in the nose, and the scarf rings on which they were mounted revolved and could be taken to pieces.

The wings were cut out of the solid wood, complete with rib "camber " and slots, ailerons, etc., were cut out or added later.

All the models had cockpit controls and hand-carved figures sitting in the dummy cockpits or working the dummy guns.

But, alas, my collection grew out-of-date, new machines came along which I had the urge to build, and many of my models were given away to admirers. But I still retain their photographs, and they give quite a good idea of the vast amount of work which was put into the models.

For a period I did not make any models of the "solid" type, reverting to the balsa duration models, which were new and intriguing to one who had spent months hacking and gouging hardwoods.

However, once a " solid " fan always a " solid " fan, and I started a new series of balsa models to the popular 1-72 scale.

The Hawker " Hind," Hawker " Fury," and the Gloster " Gauntlet," formed the trio, and they certainly were a great improvement on some of my first attempts, although I personally shall always have a warm corner of my heart for those hardwood models.

My latest " solid " is shown at the top of this page—no, not the one on the left, but the one on the right.

The " Gladiator " is built to 1-72 scale, and is constructed entirely of hardwood, and I think readers will agree that it looks quite well compared with the photo, of the full-sized aircraft, kindly loaned by *Flight*.

When I decided to make yet another " solid," I looked for a modern fighter design, but found that most ultra-modern aircraft lack that " busy " look which " solid " modellers love. The " Gladiator " fills the bill exactly. It is modern, very nice looking, and there is plenty of scope for all who like super-detail work.

My model is coloured in the pre-war paint, but in 1938

MODEL AIRCRAFT

"Aero Modeller" Staff

"GLADIATOR"————Full size or solid?

" Gladiator " squadrons were hurriedly camouflaged with dark earth and dark green " shadow shading."

The cowling, radial engine, exhausts, cockpit cover, etc., all gave me great pleasure to construct, but most of these details are lacking on say a model of the " Spitfire," with its lack of external bracings, and its clean, super-streamlined fuselage and elliptical wings.

Another intriguing part of this aeroplane is that before the September, 1938, " crisis," " Gladiator " squadrons in particular were all-silver, with brightly coloured squadron markings on the sides of the fuselage and along the top of the wing. Flight-Commanders had also the additional decorations on the rudder and wheels to denote the flights to which the machines belonged.

Here is scope for some very clever painting, and the finished model should look very smart.

The model is silver all over, with the exception of small, black details, such as wheel tyres, propeller blades, and sundry tiny details.

The usual red, white and blue cockades on the top and lower wings, and the identification numbers and letters on the underneath of the lower wing, sides of the fuselage and the rudder. After this comes one of the several squadron markings—black and white squares with black forepart of the rudder, and red, yellow or blue wheels, or any of the variety of bright-coloured markings which seem to give the fighter squadrons that distinctive " cavalry of air " look.

Shadow shading also looks very neat, but here the painting does not call for so much skill, as any small discrepancy from the original colour scheme is not noticeable.

My " Gladiator " does look realistic, and I have tried to do away with that rather " wooden " look by imitating the camber of the ribs on wings, tail and rudder, and also that of the longerons at the rear of the fuselage.

The cockpit is fitted with a dashboard, control column and rudder bar, and in the bucket seat is a tiny R.A.F. pilot.

The completed model was given several coats of banana oil before painting to fill in the grain, and then given two coats of silver dope.

A point which certainly improves the appearance of models is that of never painting-in the overlapping of the metal sheet covering. I always imitate this in the following manner:

When the model is finally ready to receive its last coat of silver dope, I draw in these lines from the plan or photograph, using a very sharp pencil, and marking very lightly. I then trace over these lines with a sharp blade, this leaves a thin " cut," which shows through the final coat of dope.

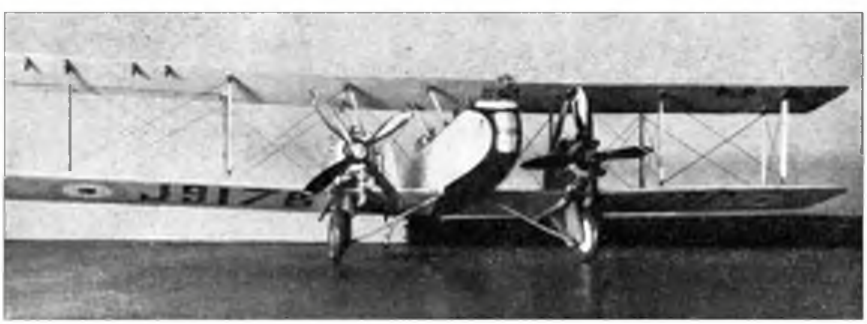
I do advise readers who are contemplating making a " solid " to obtain as many pictures of the model as they can.

From these pictures you can obtain valuable details, which it is now always possible to include in small blueprints or plans.

With regard to photographing your models, this was dealt with in the last issue of THE AERO-MODELLER, but I intend here to give you a few of the tips I have learnt in photographing " solids," as photographing " solids " is a very different thing from photographing large duration or petrol models.

Personally, I prefer daylight for model photography for several reasons.

Firstly, electric light gives models with a high gloss finish, or even those finished in silver, a " tinny " look; secondly, it is hard, and lays all the faults in your model bare, and often exaggerates them greatly. Some outlay in equipment is also necessary for indoor photography, whilst with outdoor the sun is always handy. I'll bet someone pulls me up for that last remark!



A 22 in. span Boulton and Paul "Sidestrand" built by Mr. Elwell.

Don't forget that your models are very small, and that your camera will always leave out much that you can see with your naked eye. I know of one very good professional photographer who could not take a good picture of a model. His results were not as good as mine with a Brownie box camera, because he did not have the patience or the aero-modeller's understanding of the way to pose

or light the model to get the best viewpoint and the most detail.

For models of 1-50 or smaller scale you will definitely require a portrait attachment fitting to your camera.

You can purchase these additional lenses from any photographic store, and they will tell you how to fit them. You will be able to get to within 15 in. or even a foot of the object. Even so, your model will still look small with a lot of room round it, but don't worry. If the picture is sharp, you can always trim off the excess background, etc., from the negative, and just have the tiny piece with the model on it enlarged.

I suggest that panchromatic film is used always, as the colour values are so much better.

An ordinary R.A.F. machine, with its red, white and blue cockades, with ordinary film you cannot tell the black from the red, but with panchromatic there is a subtle difference in the tone.

Choose a fine, sunny day with blue sky and plenty of fleecy white clouds, and take your model out into the garden.

We will presume that you wish to take the model " in flight," as I have done with my " Gladiator." Then your first job is to either erect or look for something to suspend your model from. A clothes line is very handy.

Two posts about 6 feet apart, and about the same height will do, and from the tops of these should be suspended some stout string.

Suspend your model from this string with very fine white thread, and put additional bracing from say the post to the undercart to steady the model. When you have got the model arranged right, bring out your camera.

It is impossible for me here to tell you what exposure to give, as this depends greatly on the situation of your yard, garden, or whatever it is, and also what time of the year, and so on. It is safest to ask the local photographic dealer on the day you take the pictures. Tell him that you intend to use the " finest stop," and ask him what exposure will be needed. He will probably say 1-25 of a second. If he does, give it 1-10.

Of course, if you are using a Brownie box camera there is only one stop, so that will not worry you.

The camera must be firmly placed on some table or stand until the correct view is given in the viewfinders, after which you can " shoot," and dash off to get the film developed.

For indoor work I used a Brownie box camera with a portrait attachment. I had electric lighting, one 75-watt bulb in the usual holder from the ceiling, and another 150-watt (Woolworths) in an electric standard lamp, which I used as a miniature " arc lamp."

This lamp was used to throw the light from very near to where I had the camera, thus lighting up the parts which were going to be photographed.

I gave exposures varying from 1½ minutes to 5 minutes, and usually obtained the best results with about 2½ minutes, varying with models of different colour. Dark models such as those shadow-shaded easily require one minute more exposure. I used Verichrome film.

I hope that these few hints will enable readers to get some really first-class shots of their models, both stationary and " in flight." I should like to include on this page only those photographs which could easily be taken for the real aircraft.

Given away in this issue are plans for a very fine " solid " Handley-Page " Hampden," and I hope that some of the photographs I receive will be of this model. There is ample scope here for some really ingenious work. The " glasshouse " at the nose and the machine gun pits (there are no power-driven turrets whatsoever on the " Hampden ") should provide scope for super-detail work.

Here are three more of Mr. Elwell's models. At top a Handley-Page " Heyford," built to the same scale as the " Sidestrand." In the lower photograph are shown an S.E.5 and an S.P.A.D.—both single-seat fighters used in the last Great War.

At present I am now engaged in building another " solid," and I hope to be able to show you pictures of this and give you fuller details in an early issue.

One aspect of this war has forcibly struck me several times, and that is the identification of enemy aircraft. So many of their types are like our own. Solid models of all the aircraft likely to appear over this country would be invaluable at lectures given by the Observer Corps, and to the anti-aircraft and naval gunners.

Please turn to foot of page 227.

Kindly mention THE AERO-MODELLER when replying to advertisers.

AN ADJUSTABLE WING FOR STREAMLINED MODELS

By G. ALLEN

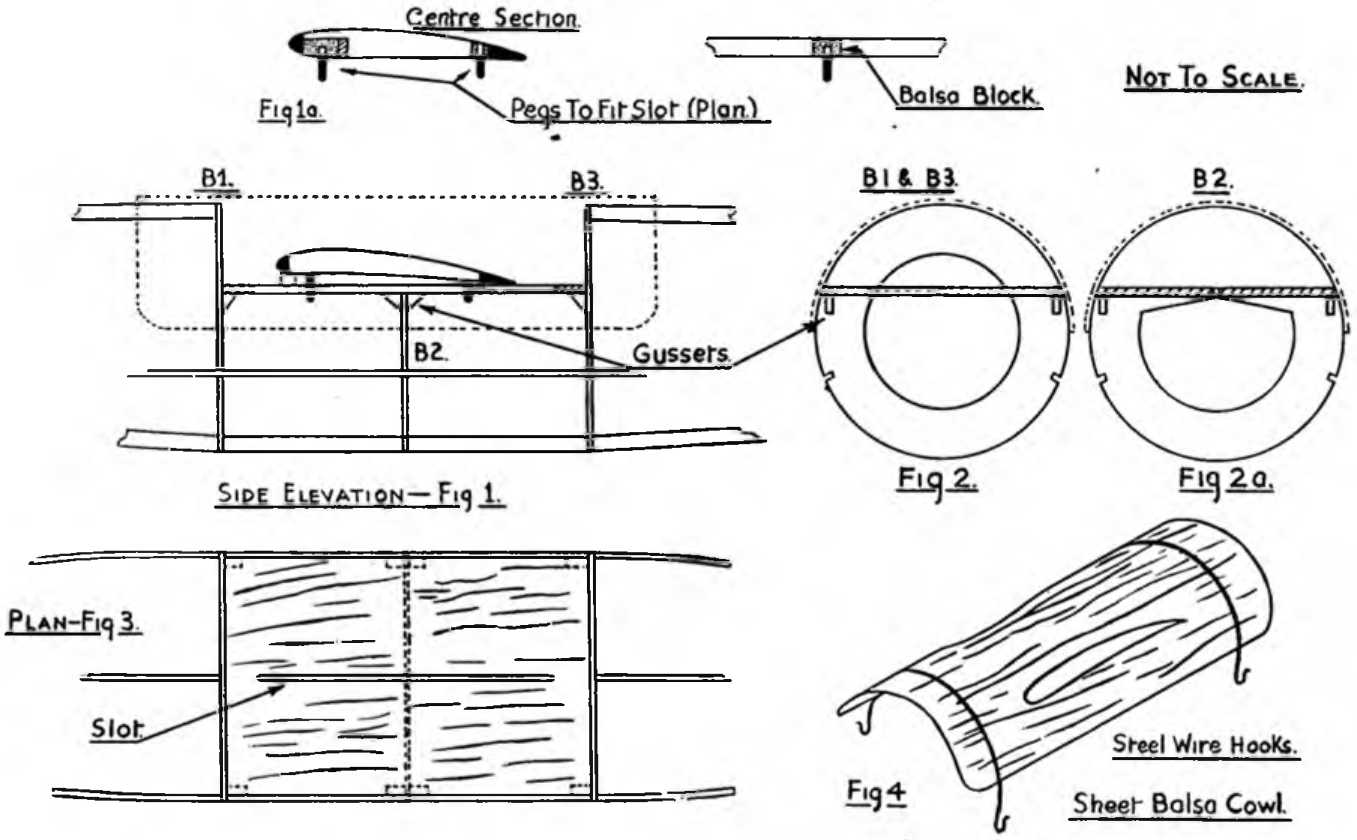
THE usual way to trim a shoulder-type streamlined model is to sling an adjustable lead weight under the fuselage. This has to be done, for on most machines of this type the wings are " built-in."

This article, therefore, deals with a method whereby the wing can be adjusted, the model remaining in the shoulder-type class.

When designing the fuselage, two bulkheads are chosen between which the wing is to be placed—B.1 and B.3 (Fig. 1). The distance between these two formers must be at least two inches longer than the chord width at the wing root. This will give one inch of adjustment both forward and backward. The bulkhead (B.2) situated in between B.1 and B.3 is shaped with a flat top similar to that shown in Fig. 2a. B.1 and B.3 are complete bulkheads (Fig. 2) A platform of $\frac{1}{8}$ in. sheet balsa is cut to fit snugly in between B.1 and B.3, with B.2 fitting flush with it. Its edges must also follow the contour of the fuselage (Fig. 3). A slot is cut along its length, as shown in the plan, $\frac{1}{8}$ in. wide. The platform is then cemented in place and strengthened by gussets. When viewed from the side it must be horizontal.

Now referring to the centre section of the wing to be employed. This must be undivided, and a little wider than the fuselage width, because it must protrude through the apertures in the balsa wood cowl (Fig. 4) *before* the dihedral commences. Balsa blocks are cemented in place in the centre section, which are positioned as shown in Fig. 1a. Into these, small $\frac{1}{8}$ in. diameter pegs are cemented—clearly indicated on the drawing. The required incidence block is also cemented in place on the leading edge. When dry, this centre section will be found to slide freely in the slot made in the platform in the fuselage.

Having accomplished this, we now turn to the balsa cowl illustrated in Fig. 4. This is made from $\frac{1}{16}$ in. sheet balsa, or from $\frac{1}{32}$ in. sheet balsa for lighter models. The cowl must be at least two inches longer than the distance between B.1 and B.3, so that when adjustment is made, the space between B.1 and B.3 will always remain covered. A flat sheet of $\frac{1}{32}$ in. or $\frac{1}{16}$ in. sheet is cut to its correct length, its width depending upon the model concerned. This is easy to find, however, as we shall now see. The end of a piece of thread is lightly cemented on the rim of bulkhead 1, half an inch below the level of the platform and stretched round the rim of the former to half an inch below the platform at the other side of the fuselage. This length of thread will be the required width of the sheet of balsa from which it is intended to construct the cowl. Apertures are now cut in this flat sheet as shown in Fig. 4, to the shape of the airfoil which is to be used. When cutting these apertures *the incidence must be incorporated* in order that the cowl will lie flat along the top of the fuselage



? ? QUESTIONNAIRE ? ?

OR

WHAT WAS *YOUR* 1939 WAKEFIELD MODEL LIKE ?

By ARNOLD WATHEW

I WANT to know, your friends want to know, all your fellow aero-modellists want to know—and your editor has asked me to try to tell you. In other words, he has asked me to write an article similar to the one which I wrote in THE AERO-MODELLER last spring, entitled " The Trend of Design in Model Aircraft." This time it is to be British Wakefield models *only* built and flown from October 1st, 1938, to September 30th, 1939.

Well, I am very pleased to oblige—if I can. Last time it was rather difficult to get together sufficiently full particulars of models to give what I felt to be entirely reliable results. This time it will be definitely impossible unless a good number of you come to the rescue. The idea is this :

On the inside back cover of this issue of THE AERO-MODELLER you will find the Questionnaire mentioned above. If all owners of Wakefield models built and flown between the dates mentioned above, and who have won 1st or 2nd place in any club, inter-club competition, or rally during 1939, will fill in the answers to my questions, and post them off to the Editor as soon as possible, and not later than March 4th, then it will be possible to show you exactly how the design of Wakefield models is progressing in this country.

As you will realise, the more forms sent in fully entered up, the more reliable will be the facts of the article. This will be produced and printed in the April issue of THE AERO-MODELLER.

Please be as accurate in your replies as you can. This applies particularly as regards the angle of incidence relative to the thrust line. If you put " Incidence $\frac{1}{16}$," this means just nothing, since I do not know where it is put nor if the longeron which the wing is packed up from is parallel to the thrust line or not.

Angles in degrees, please. Weights in ounces and tenths of an ounce. Dimensions in inches.

I must apologise for the length of the Questionnaire. Last time I had to leave out so many things that I felt you would like to know, becausee I could not get the necessary data. Weights had to be left out a lot for this reason. Also performance. Please send along those questionnaires. This article *cannot* be written unless you do !

1st and 2nd COMPETITION PRIZE WINNERS

Please fill in and send off as quickly as possible the form printed on page 4 of blue print in this issue, and help to make this survey as representative as possible.

Continued from previous page.

when fitted. The actual position of these apertures is ascertained by the thread method as used before. The centre section is slid along the platform until the leading edge touches B.1. The end of a piece of thread is again lightly cemented to B.1, this time at the point where the leading edge just touches the former. It is then stretched round the former's rim to the corresponding point on the other side of the fuselage. This length of thread then gives the distance apart of the apertures which are to be cut in the flat sheet of balsa. Incidentally, when cutting these, see that their leading and trailing edges are an equal distance from the edge of the sheet. Do not forget, however, to incorporate the incidence before cutting.

The job is now to bend the sheet to the contour of the fuselage. This can be accomplished by soaking it well in hot water, or steam from a kettle, and binding it with tape either on to the fuselage itself or on to a pre-made block which has the same profile as the section of the fuselage necessary.

When thoroughly dry, its shape will remain, but to be on the safe side, small part-formers can be cemented on the underside of the cowl at the top and in the middle. Care should be taken here, however, to see that these will not interfere with adjustment.

The centre section is now fitted in place, its two root ribs passing through the apertures in the cowl. This can be done by springing the cowl on, or by first pushing one end of the centre section through one of the apertures from the underside, and then sliding the other end in place. This is now cemented in place, and can be filleted on the outside.

Wire hoops are made, as shown in Fig. 4, and hooked at the ends. These are cemented on the outside of the cowl. Rubber bands attached to the hooks serve to hold the unit to the fuselage.

And now a few suggestions with regard to the unit. Sandpaper a radius on the edges of the cowl and polish the whole attachment in the usual way. The wings of the machine can be dowelled into the protruding centre section ribs and are then readily detachable.

In conclusion, I wish to state that although I have written this article, the germ of the idea was given to me by Mr. Keith Williams, another keen aero-modellist.

THE ANNUAL GENERAL MEETING OF THE SOCIETY OF MODEL AERONAUTICAL ENGINEERS

Notes on the Annual General Meeting of the S.M.A.E., held on Sunday, January 14th, 1940, at the Grafton Hotel, London.

Dr. Thurston was in the chair.

The Minutes of the previous annual general meeting were read and confirmed.

Mr. E. F. H. Cosh, the hon. secretary, then gave his yearly report, as follows:

Hon. General Secretary's Annual Report.

MR. CHAIRMAN, LADIES AND GENTLEMEN,

Model aeronautics, in common with almost every other science and sport, has received a severe set-back, due to the outbreak of the present conflict. Had normal conditions prevailed throughout the year which I have to review in this, my fifth, annual report, I should have had the pleasure of reporting that this period had been the most successful in the history of the Society.

At the conclusion of the 1938-9 financial year there were 92 clubs affiliated to the Society, by the end of August, 1939, this number had increased to 134. Thus in the first eight months of 1939 the total number of affiliated clubs had increased by 42, a larger increase than had been made in any previous twelve months. I feel sure that you will agree that this is a very creditable achievement. Since the outbreak of the war many clubs have decided to terminate, or suspend, their activities, and whilst in some cases this action may have been unavoidable, I believe that in the large majority of instances it was unnecessary. I have experienced considerable difficulty in ascertaining the number of clubs which have ceased to function, but according to my present information this number is 49. Therefore, the remaining number of affiliated clubs is 85, almost the same number as were affiliated this time last year. After taking into account all the circumstances, I feel that this position is by no means unsatisfactory, particularly as almost all of the well established clubs are still carrying on their work, and have assured us of their continued support.

As I have not yet seen a copy of the final balance sheet, I am unable to comment to any extent upon the Society's finances, and will leave this to the treasurer, Mr. L. J. Hawkins, to deal with. It can be said, however, that despite certain rather heavy items of expenditure, the Society's financial position remains eminently sound. Before leaving this matter, I should like to pay tribute to the extremely efficient manner in which Mr. Hawkins has carried out his duties. I have good reason to know that the present duties of the treasurer of the Society are very heavy, and necessitate the devotion of many hours of spare time if they are to be carried out efficiently. I feel sure that you would wish me to thank Mr. Hawkins on your behalf for his willing work in the Society's interests.

Mr. J. C. Smith will give you his report of the past competition season, which, but for its enforced termination, would have been an outstandingly successful one. Unfortunately, two decentralised contests and one centralised contest had to be left undecided. With regard to the coming flying season, every effort will be made to arrange a modified competition programme consisting of decentralised contests of a popular character. It has already been decided to make no alterations to the formulæ for Wakefield Cup models, and although it will not be possible for this important contest to be held during war-time, your Emergency Committee are aware of the desirability of ensuring that the development of this class of model shall be continued. One of the pleasing features of the past season was the success of the Wakefield Cup Fund, and I know that our esteemed Patron, Lord Wakefield, greatly appreciates the fact that the affiliated clubs were able to raise over a half of the amount required to send the British team to the United States of America. Although this team's effort to bring the Wakefield Cup back to this country was unsuccessful, I can only repeat that this was in no way due to the team itself. Whilst our models are selected by means of a contest held in our peculiar weather conditions, their performances in entirely different circumstances must be problematical; certainly the present method of selection avoids controversy, but I am not convinced that it gives us what we desire, namely, the best six Wakefield Cup models in the country. Another contest which must be mentioned was that for the King Peter Cup. The fact that, despite the very unsettled state of International affairs at the time of the contest, we received such a large entry from abroad merits special mention. When comparing the organisation of International contests in this country with those held abroad, I do not think that it is sufficiently appreciated that here the whole of the organisation falls upon the shoulders of voluntary officials, whereas abroad the arrangements are invariably in the hands of officials appointed solely for this purpose, and receiving the full backing of a Government Department. Nevertheless, bearing this fact in mind, I consider that we have every reason to be proud of the manner in which the King Peter Cup contest was conducted. Mr. J. C. Smith has well earned our best thanks for his work in connection with this and the other competitions held during last year.

Having remarked on the Society's past work, I should like to cemment briefly on the future activities. In my report at the last annual general meeting I suggested

the setting up of an Emergency Committee to facilitate the work of the Society. This suggestion met with little support, but now that the black-out and travelling difficulties have hindered the holding of full Council meetings the need for this Committee became imperative. As you are already aware, an Emergency Committee has been elected to continue the work of the Council during wartime. This Committee is composed of men with considerable experience in matters appertaining to our movement, and I have no doubt that the coming months will prove the wisdom of your action in appointing them. It is too much to expect that you will always agree with their decisions, but I do appeal to all affiliated club members to give this Committee their confidence and co-operation. Their task may not be an easy one; it will be much easier, however, if they are accorded your full support.

Before concluding I should like to place on record my sincere appreciation of the valuable assistance which I have received from my fellow officers, who have done their best to lighten the burden of secretarial work. On behalf of the Society I should also like to add my thanks for the support which we have received from the affiliated clubs.

We cannot visualise what difficulties we may have to face in the months ahead, but we shall be playing our part in the national effort if we devote *our* efforts to the continued progress of the model aeronautical movement.

E. F. H. Cosh.

Dr. Thurston congratulated Mr. Cosh on his report, which the meeting had very great pleasure in accepting.

Mr. L. J. Hawkins, the hon. treasurer, then presented the balance sheets for the Wakefield Cup Fund, King Peter Cup Fund, together with the annual balance sheet of the Society. He then gave his report, as follows:

Mr. Chairman, Ladies and Gentlemen,

The past year has been a successful one financially, and but for the outbreak of war it would undoubtedly have been better. The falling-off of affiliation fees since the outbreak of war has been noticeable, but in spite of that the amount received under this heading during 1939 exceeded that for 1938 by £46 15s.

Donations and Subscriptions.

Apart from the generous donation from Lord Wakefield towards the General Funds of the Society, donations and subscriptions from Patron Members and others have decreased by £18 17s. 6d.

General Working Expenses.

As regards the working expenses, postages increased by £4 2s. 10d., and printing and stationery by £21 18s. 10½d. This is explained by the large increase in the number of affiliated clubs and the consequent extra work involved thereby.

Competition Entrance Fees.

There was an increase in this item of income of £6 10s. 4d. over the previous year, but this figure would have been higher but for the competition season coming to an abrupt end owing to the outbreak of hostilities.

Badges.

Although in the present balance sheet it would appear that the profit accrued from the sale of badges is only £3 4s. 2d., I would explain that on the debit side is included in the cost of badges an amount of £23 6s. 10d. This should have appeared in the balance sheet for 1938, but the account was received too late for inclusion therein. In can be said, therefore, that the profit accrued from this source for the years 1938 and 1939 is £26 1s.

Handbooks.

This item in 1938, and in previous years, showed a loss to the Society, but this year we have been able to cover the cost, and, as a matter of fact, have made a small profit of 10s. 3½d. This is very satisfactory considering the large number of complimentary copies issued.

Diaries.

The introduction of the S.M.A.E. diary proved a success, and from the sale of these we were able to pass over to the Wakefield Cup Fund the sum of £8 18s. 1d.

Petrol Registration Fees.

The income received from this source was nearly double that for the previous year, being an increase of £8 16s. 9d.

Dray Memorial Fund.

The fund instituted for the benefit of the widow of the late Mr. Dray resulted in a total donation for this lady of £52 5s. 3d. This included the amount donated by the Society of twenty-five guineas. This again, I am sure, would have been much larger had it not been for the present circumstances.

King Peter Cup Fund.

The entertainment and hospitality of our foreign guests turned out to be a bigger proposition than expected, and which resulted in a deficit of £54 17s. 10d. over the amount so generously donated by Lord Wakefield for this purpose. I am sure, however, that our visitors returned to their homes with a very good impression of British aero-modellers. As will be seen from the Wakefield Cup Fund balance sheet, there is a credit balance which more than covers the deficit on the King Peter Fund. There is an amount of £6 due to the Society, which was paid as a depsoit in connection with import duty on foreign models, but this has not so far been received.

Wakefield Cup Fund.

There is a separate balance sheet in connection with this fund, which I think does not require comment by me, except that I congratulate all clubs, and all other contributors to this fund, on the substantial total reached. Balance in hand is an increase of £84 11s. 9d. over the previous year.

Before closing I should like, once again, to express my appreciation of the help and assistance given me by all the other officers of the Society during the past year, which has made my job a pleasure.

The various balance sheets were then passed round the meeting and accepted.

The meeting decided that the balance sheets for the King Peter and Wakefield Cup Funds should only be published in the *S.M.A.E. Journal*.

The hon. competition secretary, Mr. J. C. Smith, was

absent from the meeting owing to A.R.P. work. His report was read by Mr. Cosh, as follows:

Hon. Competition Secretary's Report.

MR. CHAIRMAN, LADIES AND GENTLEMEN,

In making my report I propose to be brief—very brief, more especially as we are now confronted with a situation which offers opportunities vastly different to those of pre-war. We are entering a new phase which will call for all our ingenuity to master.

It cannot be denied that the Society's activities during the year passed have been greater and more important than the model movement has ever experienced, and the present set-back as far as foreign associations are concerned will, as has been previously expressed, enable us to develop our national resources to a much greater extent and to enable us to explore new and untried competitions which in due course we can hope to introduce to the world.

The Wakefield and King Peter Cup Competitions have been fully discussed, described and analysed; they were still at the outbreak of the upheaval the most important throughout the world, the Wakefield still being the one which, judging from entries, is the most popular at home here.

To the Halifax Club congratulations are wholeheartedly due for lifting the Plugge Championship Cup. A grand win with 1,272 points, closely followed by the Northern Heights, 1,262, and Lancs, with 1,217 points.

I have usually given comparisons between provincial and London entries in the season's competitions, but each year it has proved more and more difficult to decide where to draw the line of demarcation, and so this year I have omitted such comparisons.

To all winners of competitions due congratulations are tendered, whilst to the "also rans" the hope that their time will come. The same applies to record-breakers.

My thanks, not only to the Society's officials for co-operation in enabling me to carry on my job, but also to many willing volunteers who have so readily come forward when called for, and for the inestimable help rendered.

A last word to all clubs. Without doubt there are much more difficult times ahead; but do, whatever the difficulties you may meet, however hopeless it might all seem, keep going if anyhow at all possible.

J. C. SMITH.

The subject of cash prizes for the 1940 competition season was discussed, and, owing to the many divergencies of opinion, Mr. Bell was asked to write in the *S.M.A.E. Journal* for the abolition of cash prizes, and Mr. Bullock in favour of their retention. A paper vote will be taken after the publication of these two letters.

The officers of the Society then resigned. Mr. Bell was elected chairman whilst elections took place.

Dr. Thurston was unanimously voted president.

Sir Kingsley Wood, Sir Richard Wells and Miss Pauline Gower, with their sanction, were elected vice-presidents of the S.M.A.E. in addition to those already holding that position.

Mr. A. F. Houlberg was elected chairman, Mr. C. A. Rippon vice-chairman, Mr. E. F. H. Cosh hon. secretary, Mr. L. J. Hawkins hon. treasurer, Mr. R. N. Bullock hon. technical secretary, Mr. J. C. Smith hon. competition secretary, and Mr. H. York, hon. Press secretary.

Mr. C. S. Rushbrooke was elected a Fellow of the Society in recognition of the work he has done in the past to further the aims of all aero-modellists, particularly those in the North of England.

Mr. D. A. Gordon was elected hon. assistant secretary to the Society. The meeting decided that as this was a new position Mr. Gordon should be elected to the Emergency Committee. This election brings the total of the Committee to thirteen. Mr. Gordon stated his willingness to do all in his power to take over the hon. secretary's work should Mr. Cosh be called to the colours.

The meeting had much pleasure in voting Mr. Cosh an honorarium of twenty pounds, in recognition of the work he has done during the last twelve months, and hoped that it might recompense him for the monetary expenses that the office of hon. secretary entails.

At this point Mr. Bell vacated the chair, and received a hearty vote of thanks. Mr. Houlberg then took the chair.

The meeting then considered the recommendation of the Emergency Committee that the maximum subscription for affiliation and reaffiliation should be one guinea. This was accepted, and the Emergency Committee were given discretionary powers to consider applications for reduced fees from clubs that might be financially embarrassed owing to the war.

It was decided that during hostilities the minimum age of official timekeepers should be reduced from eighteen to sixteen years.

* * * *

Warrant-Officer Gutteridge presented to the Society a trophy to be competed for by Wakefield type models. In handing the trophy to Dr. Thurston Warrant-Officer Gutteridge spoke as follows:

MR. CHAIRMAN, LADIES AND GENTLEMEN,

At a Council meeting of the S.M.A.E. on November 12th, 1939, I announced that I would like to present the Society with a trophy to be competed for annually during the war for Wakefield type models in a national competition.

So that there can be no misunderstanding, I wish to repeat the purpose of this trophy, and all it symbolises.

In my long experience of the R.A.F., and the development of one of the R.A.F. model aeroplane clubs, I have received a great deal of inspiration in my activities from officers of high rank, who have indicated to me the importance they attach to Service men and boys interesting themselves in model aircraft, and in the active support they have given me in the development of the club to which I belong.

I have not overlooked the international side of model aeronautics, and the extent to which the S.M.A.E. and its patrons are largely responsible for development in this respect. The international movement inspires us to produce the best in us, to put our country on top and to foster that international goodwill that is so necessary to produce the everlasting peace for which we are now fighting, and which we are going to obtain.

This brings me to the main points behind this trophy:

1. In my view, the model aircraft movement must continue, and those interested must be kept together as much as possible.

2. The war, and consequent restrictions, keep people at home more, and hobbies are necessary to while away the spare time. The model aircraft hobby claims to be as well fitted as any other, if not more, for such a pastime.
3. The international movement has ceased for the duration, but on resumption this country must have teams to represent it, capable of bringing back lost trophies and holding those already held.

To these aims I dedicate this trophy as—dare I hope?—an inspiration to the aero-modeller to continue in his work and to keep up the international standard of the country during the war.

The type of model which creates the greatest international interest is the Wakefield model, and we must remember that the Wakefield Cup is now held by America. This we must win back at the first attempt possible on the resumption of international competitions.

Meanwhile, the Americans are unhampered by war conditions, and are therefore able to pursue their model activities. That gives them an advantage over us, and so we must continue to develop our models and counteract such advantages to our own benefit.

I therefore wish this trophy to be competed for annually, in a national competition during the war, for Wakefield type models, by decentralised competition through eliminating rounds under area control, with the final round centralised.

With regard to the details, I leave these to the discretion of the Emergency Committee, as these will depend on many circumstances.

After the war the trophy may be used for such competition as may be decdied by the S.M.A.E.

With regard to naming the trophy, some inspiring titles were suggested at the last Council meeting, and I find it difficult to settle on an appropriate title, and I suggest for the time being it may be known as the " Gutteridge Trophy " until it is reallocated after the war, when an appropriate title can be made.

In conclusion, I desire that, during the war, the winner should actually hold the trophy in his possession for two months. The Society will rely upon the winner taking all precautions for its safe keeping, short of a direct hit, and ensure its return to the Society at the end of this period, or earlier, should the winner have to leave his home address.

* * * *

It was suggested that this trophy should be held for competition between England, Northern Island, Scotland and Wales. This matter will receive the attention of the Emergency Committee, of which Warrant-Officer Gutteridge is a member.

In order to facilitate business at the Emergency Committee meetings, the Committee had made a minute that visitors could only attend their meetings at the request of the majority of the Committee members. The meeting discussed this decision at some length, and various opinions as to the advisability of this procedure were fully considered. The meeting finally confirmed the Emergency Committee's minute.

The meeting closed at 9 p.m., having lasted six hours, with a vote of thanks to the chair.

H. YORK, *Hon. Press Secretary.*

SOCIETY OF MODEL AERONAUTICAL ENGINEERS—BALANCE SHEET.

INCOME.

	£	s.	d.
To Balance brought forward from 1938	237	10	9½
„ Donations:			
Lord Wakefield	100	0	0
Lieut.-Col. Moore-Brabazon	1	1	0
Miss P. Gower	0	10	6
E. N. Bray, Esq.	0	10	6
Dr. A. P. Thurston	2	2	0
„ Subscriptions	2	3	0
„ Competition Entrance Fees	50	0	10
„ Affiliation Fees	152	12	0
„ Sale of Badges	60	8	3
„ „ „ Annual Dinner Tickets	27	17	0
„ „ „ Handbooks	33	9	3½
„ „ „ Diaries	46	16	8
„ „ „ Transfers	4	12	3
„ „ „ Indoor Flying Tickets	2	16	2½
„ F.A.I. Licences	4	0	0
„ Petrol Model Registration Fees	18	9	3
„ Contributions to Dray Memorial Fund	27	9	3
„ „ „ Wakefield Cup Fund	715	12	7
„ Donation from Lord Wakefield to King Peter Cup Fund	250	0	0
„ General Funds. International M.A. Ltd. (Frog Contest—Prizes)	27	5	0
Return from C. H. Moore, Esq.	3	0	0
W. H. Martin Ltd. (claim for King Peter Cup repair)	5	4	0
	£1,772	10	4½

(*Signed*) L. J. HAWKINS,
Hon. Treasurer.

Audited and found to be correct this the 10th January, 1940.

(*Signed*) VICTOR H. GOLLOP,
Hon. Auditor.

EXPENDITURE.

	£	s.	d.
By Postages	25	0	9½
„ Printing and Stationery	39	1	0½
„ Competition Prizes (including Frog Contest) ...	52	8	5
„ Repair to King Peter Cup	5	7	6
„ Carriage and insurance—King Peter Cup ...	12	14	6
„ Engraving cups	2	7	0
„ Printing blocks and photographs	4	5	5
„ Underwood typewriter	13	13	0
„ Filing bureau and desk	7	0	0
„ Hire of van and marquee (Wakefield trials) ...	7	18	0
„ Armbands and ropes (Wakefield trials) ...	0	14	10
„ Loudspeakers (Wakefield trials)	4	4	0
„ Translation bureau	1	17	6
„ Range-finder	13	10	0
„ Typist's wages	5	17	6
„ Repair to Caton Trophy and stop-watch ...	0	7	3
„ Transfers	7	2	4
„ Insurance of cups and trophies	2	17	3
„ Telephone and telegram accounts	16	16	8
„ Hire of meeting rooms	14	13	0
„ Sundries (tips, etc.)	2	0	0
„ Badges. Engraving 3,486 at 3d.	14	10	6
Cost, 1,833	42	8	7
Refund to St. Albans M.A.C. ...	0	15	0
„ Cover design for *S.M.A.E. Journal*	1	1	0
„ S.M.A.E. Handbooks	32	10	0
„ Annual dinner	41	11	6
„ Dray Memorial Fund	52	5	3
„ Hon. General Secretary's honorarium	20	0	0
„ Exhibition expenses	9	3	6
„ S.M.A.E. Diaries	36	18	7
„ Wakefield Cup Account. (See separate a/c.) ...	651	3	2
„ King Peter Cup Account. (See separate a/c.)	306	19	9
„ Cheque books	1	5	0
„ Balance-in-hand	322	2	6½
	£1,772	10	4½

S.M.A.E. EMERGENCY COMMITTEE

Notes on a meeting of the Emergency Committee of the S.M.A.E., held on Sunday, February 4th, 1940, at the Grafton Hotel, London.

At the opening the meeting the following gentlemen were present: Dr. Thurston, Messrs. Cosh, Hawkins, Smith, York, Gordon, Bell, Rushbrooke, Knight, and Warrant-Officer Gutteridge. Messrs. Houlberg and Rippon arrived later, having been delayed on their journey.

Mr. Hawkins was elected temporary vice-chairman, as Dr. Thurston asked to be relieved of the office of vice-chairman, in order that this office should not interfere with his duties as president of the Society.

The Minutes of the Council meeting held at the Grafton Hotel on Sunday, November 12th, 1939, were read and confirmed.

The Minutes of the Emergency Committee meeting held on December 10th, 1939, were also read and confirmed.

The meeting then decided to elect a vice-chairman. A ballot was taken, which resulted in Mr. Bell being elected to this office. He thereupon took the chair.

In a letter to Dr. Thurston, Sir Kingsley Wood stated that he would be pleased to accept a vice-presidency of the Society. Sir Richard Wells had also accepted a similar office, but no reply had yet been received from Miss Pauline Gower. This was no doubt due to her strenuous war work.

Since the last meeting another eleven clubs had notified Mr. Cosh of their intention of carrying on during the war period.

The Emergency Committee exercised their powers by accepting the reaffiliation of the Swinton and District Model Aero Club at a reduced fee. The club had supplied a balance sheet showing their financial status.

The Model Aircraft Club and Northern Heights Model Flying Club were both reaffiliated.

The Batley and District Model Aircraft Club were accepted for reaffiliation on condition that the fee should be forthcoming.

The Speldhurst (Kent) Club were affiliated.

The Newcastle (Staffs) and District Model Aero Club had certain alterations made to their timekeepers.

A letter from Mr. Ross, Lord Wakefield's private secretary, was read, in which he stated that since Messrs. C. C. Wakefield and Co. Ltd. had been evacuated to Beaconsfield they had formed a model aeroplane club. Mr. Cosh was instructed to write to Mr. Ross offering every assistance possible. Dr. Thurston stated that he had already presented the club with a cup. Mr. Rippon suggested that perhaps the cup could be put up for a " Construction and Finish " competition.

The Committee then discussed the 1940 competition programme, and decided that the following competitions should be held.

May 19th.—GAMAGE CUP. Rules as last year.

June 9th.—S.M.A.E. CUP. For a nomination competition for teams of three. Each team to get the nearest to 660 seconds. Any type of rubber-driven model allowed.

June 30th.—Weston Cup for Wakefield Models.

July 14th.—FLIGHT CUP. A new formula competition. Models for this competition to conform to the S.M.A.E. fuselage formula and to have a maximum wing area of 144 sq. in. To contain a maximum amount of 1 oz. of rubber and have a minimum total weight of 5 oz.

July 28th.—GUTTERIDGE TROPHY. For Wakefield models. Decentralised competition—entries must be received before the actual competition day. Competition between England, Scotland, Wales and Northern Ireland, the nationality of the competitor winning the competition deciding which country wins

August 25th.—The K. and M.A.A. Cup. Biplane competition. Rules as last year, with the exception that models should have a total *maximum* wing area of 200 sq. in. and *not* a *minimum* total wing area of 200 sq. in.

September 8th.—WOMEN'S CHALLENGE CUP. For duration models. Rules as last year.

September 22nd.—DR. THURSTON'S GLIDER CUP. For gliders conforming to the F.A.I. regulations.

All Competitions are to be Decentralised.

The Plugge Championship Cup will be awarded to the club with the highest number of points obtained in the Gamage, Weston, Flight, K. and M.A.A. and the Thurston Glider Cup. The individual Championship Cup presented to the Society by Dr. Thurston (this must not be confused with the Dr. Thurston Glider Cup) will also be flown for. The Caton Trophy Competition for the best flight of the year will also be held.

The Committee decided that the prizes should be announced after the ballot on this matter had been held.

The entrance fees for the competitions were fixed at: Seniors 1s., (Juniors 3d., under 15), non-members 3s. 6d.

The Photographic Competition was discontinued for the duration of the war.

The Committee decided that in future the aggregate of three flights R.O.G. should be taken instead of as hitherto, the average of three flights.

With a view to keeping alive the interest during the war the Committee suggested that clubs should organise " Continuity " contests. For the benefit of those clubs who have not tried these competitions, the rules are, briefly as follow: Timekeepers should be on the field every week-end. Competitors should be allowed a given number of flights per week, the total times being regarded as their score. The competitor with the highest score of the month being adjudged the winner.

The Committee decided that a special issue of the *Bulletin* containing the competition programme should be produced.

The advisability of badges for time-keepers was discussed, and it was decided that various designs and suggestions should be considered at the next meeting.

The last item on the agenda was the S.M.A.E. lectures, and it was decided that well-known aero-modellists should be written to and asked to assist the Emergency Committee in this direction. Several suggestions were forthcoming as to what type and form these lectures should take. It was also considered advisable that a small deposit should be charged to the clubs for the loan of these lectures, the deposit being refunded to the clubs on the safe return of the lectures.

The meeting closed at 9 p.m. with a vote of thanks to the chair.

H. YORK,
Hon. Press Secretary.

AT THE SIGN OF THE WINDSOCK

WE have recently examined a kit supplied by Super Model Aircraft Supplies, 220 Wellingborough Road, Northampton, of their super Wakefield design, the " Victrace." This high-wing model is the result of the experienced technical advice available to this firm from their manager, Mr. E. W. Evans, who has won many awards for his designs and workmanship.

The " Victrace " was designed at the end of last season, and contains many features which were found to be " prize-winning " qualities during last summer's contests.

The kit is complete in every way, and extremely good value for money. The balsa is of fine quality, and ample supplies of cement, dopes, tissue paste, etc., are provided (even rubber bands with which to assemble the completed model).

" The Rocket " is yet another Wakefield designed by Mr. Evans, and has proved extremely popular. This model won the Clyde Dockyard Trophy last summer, and has numerous fine flights to its credit.

We all expect to see many of the above models flying in the contests which are being arranged for next summer, and we are sure that they will be well up in the list of awards.

Full details of these two kits and a full range of balsa, propellers and accessories can be obtained by sending for the illustrated catalogue or referring to this firm's advertisement on page 248.

Studiette are offering valuable prizes in a novel competition, full details of which appeared in our last issue.

The first prize is a voucher for 20s. worth of Studiette products and a super kit value 12s. 6d. for making a flying scale model of the Westland " Lysander "; the second prize is a 15s. voucher worth of Studiette products; the third prize also a voucher for 10s.; and there are also twelve consolation prizes of Studiette balsa tool outfits.

All you have to do to enter is to obtain a kit of the Studiette Hawker " Fury " flying scale model, build it according to the instructions, and fly it. Have your flights timed by some responsible person, club official, schoolmaster, etc., and if you make a flight of over 30 sec. R.O.G., send in your time, duly vouched for as above, and accompanied by the end label of the box in which you received your kit, to Studiette, Stanley Works, Kent Street, Birmingham, marking your envelope (Model Dept. C).

In our " On Test " of January we reported that this model was a very fine flyer for a scale type, and no doubt many of our readers will have the good fortune to clock over half a minute.

The prizes are well worth winning, and anyone who knows the excellent quality of Studiette products would not miss the opportunity of obtaining several shillings' worth free, to say nothing of the pleasure of building and flying the " Fury."

Messrs' Studiette's advertisement this month appears on page 211.

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The Midland Model Co. (Retail), 2 Navigation Street, Birmingham 2, carry a very full range of all model aircraft materials and accessories, for both rubber and petrol-driven models.

Their advertisement appears on page 192. Their range of duration and scale flying models is very large, ranging in price from 1s. to 30s. for the rubber-driven and from 22s. 6d. to 52s. 6d. for the " gas jobs."

In addition to the above-mentioned lines, this firm claim to carry the largest stock in the Midlands of the famous " Penguin " and " Scalecraft " solid scale models.

The last model aircraft window display at this firm's headquarters proved extremely popular, and they intend to repeat this for the first fortnight in March, when they hope to stage an air battle on a large scale. Enthusiasts in the Birmingham district, therefore, would do well to pay a visit to this, and at the same time inspect the comprehensive stocks of kits and accessories.

* * * * * *

Aero-modellers in the Chiswick district of London are evidently well catered for. G. W. Kones Bros. & Co., of 56 Turnham Green Terrace, Chiswick, W.4, stock a very large range of all types of model aircraft kits and accessories, including " Drome," " Cloud," " Scalecraft," " Aeromodels," " Peerless," and " Comet "; also Caton rubber, a complete range of Joy-plane products and Le Page's cements.

Messrs. Jones also are specialists in wood-cutting, and can supply the best quality balsa wood cut to any size.

Model Aircraft Stores (Bournemouth) Ltd. have informed us that their new range of " Truscale " solid kits are selling very well, due no doubt to the increased interest in military aircraft brought about by the war.

The " Truscale " range are 1/72 in. scale models of the most popular aircraft in use by the British, French and German Air Forces, and are, as their name suggests, " true to scale " according to the very latest information available.

We have examined a kit for building a Heinkel Heavy Bomber 111, of the German Air Force, and features which interested us were the plated metal propellers with pitch and camber incorporated, hardwood cowls and wheels, fuselage and wings already cut to shape out of good quality balsa, nacelles, stabiliser and rudder clearly printed on the requisite sheet balsa; and lastly, a clear and fully detailed plan with performance figures and a sheet of instructions.

Fuller details of this new series, which will be added to from time to time, appear on page 215.

The kits, which we are told are being used by many training corps for identification purposes, are priced from 1s. to 2s.

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A Fairey "Battle" built from a kit supplied by Chingford Model Aerodrome.

Above is an illustration of one of the range of "solid" scale kits manufactured by Chingford Model Aerodrome, 155 Station Road, Chingford, E.4.

These kits are packed in a stout box with a photo of the prototype on the lid. Wings, fuselage, etc., are neatly cut out of balsa block and sheet, cement, tins of enamel, super blue-print, seats, insignia and wheels complete the attractive contents.

As these kits are to the scale of ¼ in. to 1 ft., they are large enough to incorporate a great amount of detail, and the drawings are very accurate for this purpose.

In each kit there is an entry form for the Chingford Model Aerodrome's monthly competition. All you have to do to enter is to send in a photograph of your model when completed. There is a prize of a kit each month for the neatest model constructed from one of these kits.

Will aero-modellers please note that this firm is wholesale only, and their products can only be obtained from all good class toy shops and model stores? Chingford's advert. appears each month at top of the page facing our front cover. This month the page number is 175.

The Ashton Model Aero Supplies, 58 Oldham Road, Ashton-under-Lyne, Lancs, have a cheery word for us this month. They have written to tell us that business is being carried on as usual, and that all orders received are being dispatched the same day whenever possible. That is certainly the way to keep the flag flying.

They have large stocks sof first-class materials, and they will be pleased to send any reader a price-list on receipt of his name and address and a 1½d. stamp.

The kit for their well-known duration model, " The Sprite," has been selling very well, and many purchasers of this kit have written to them praising the high standard of the contents of the kit, and also agreeing that it is very good value for money.

The kit for this fine duration model costs only 10s. 9d., plus 6d. postage.

Fuller details of The Ashton Model Aero Supplies' kits and materials will be found in their advertisement on page 248.

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Undoubtedly one of the pioneer manufacturing firms of scale model kits in England is the Model Shop, College Road, Newcastle-on-Tyne. These manufacturers have a comprehensive range of approximately twenty-five kits to choose from, at prices ranging from 1s. to £3 15s.

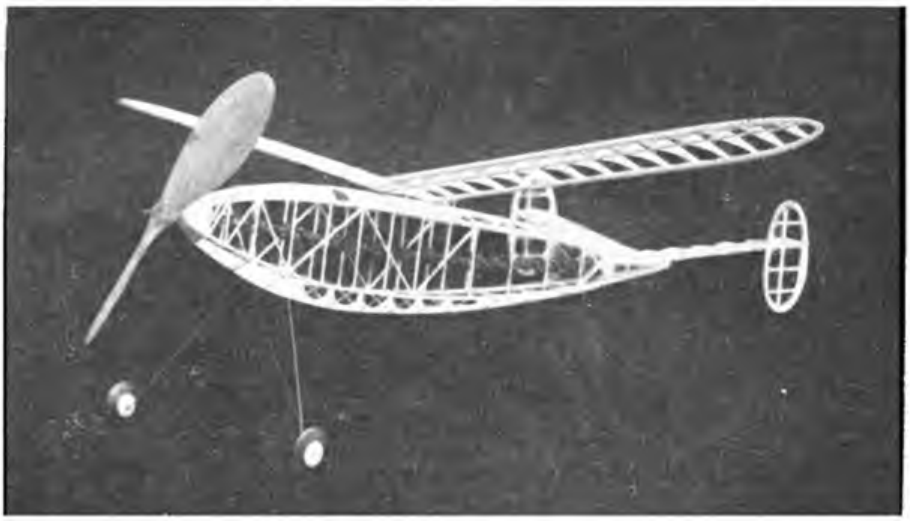
The Model Shop were also the original firm to manufacture " air wheels " in England. These range in size from 2½ in. to 4½ in. in diameter, and a guarantee of twelve months is given with each pair of wheels.

The products of this firm are certainly amongst the most reliable in the trade, and we have recently examined a kit for the new " Keelbild " flying scale Westland " Lysander." The kit is complete in every way, and bears the stamp of this firm's long experience in manufacturing flying scale kits of distinction.

The balsa is of good quality, and a new feature is the hollowed-out spats provided; also the ready-turned cowling.

The Model Shop, we understand, have now under preparation a new series of tested duration models.

Readers can obtain this firm's catalogue for 3d. post free, or obtain more details of their kits from their advertisement on page 190.



The " Victrace " Wakefield model referred to on the opposite page.

AIR DEFENCE CADET CORPS NOTES

By DUTY PILOT

All Squadron reports should be sent, by the 28th of each month, to:

Headquarters:

KINNAIRD HOUSE
1a PALL MALL EAST
LONDON, S.W.1

Members of No. 85 (Southgate) Squadron with a display of well-built models.

IN private life I am always coming up against people who want to write, and who seek my advice on how to become playwrights, novelists, poets and sob-sister or brother reporters. They nearly always want to write something they know little or nothing about, and when I suggest to them that they should start by writing about some activity with which they are familiar they are as offended as if I had asked them to clean my boots. I have to explain to them that writing is a difficult art which must be patiently studied and practised before true skill can be acquired, and that the best way to start is to write about something they know. If they do that they may attain success very quickly, for it often happens that an unpractised writer, dealing simply and unaffectedly with a subject on which he is enthusiastic and well-informed may surpass the efforts of the professional.

Most aero-modellers are enthusiastic, and many of them are remarkably well-informed, not only about models but about the full-scale machines they are copying. Why is it, then, that they do not write to me about their activities? I can only come to the conclusion that they are so busy doing their modelling that they have no time to write, or that they are shy. Neither of these is any excuse. Writing about problems with which you are dealing helps to clarify them, and shyness fades away when you are doing it. So please get busy.

However, quite a few people *have* provided me with some information! I hear, for instance, that No. 85 (Southgate) Squadron is laying the groundwork for real model air activity in the near future by a series of instructional talks and demonstrations under the guidance of Mr. C. A. Rippon, of the S.M.A.E. and the Northern Heights Model Flying Club. The report says:

"Cadets are being taken through the phases of designing and constructing a simple duration or general flying model, the various pitfalls for the beginner being explained to them so that they can profit by the instructor's varied experience in designing for beginners. Already some of the cadets' own models have been in action at indoor flying meetings, and several of them show great promise of becoming sound aero-modellers, the standard of work being very good. No doubt the spring will find them putting up fine performances with outdoor models and demonstrating to their colleagues the finer points of duration and stability. Recently, too, the Cadets put up a fine show at the local Odeon Cinema, and their work was the subject of much interest, giving the citizens of Southgate concrete evidence that No. 85 Squadron was a live and vigorous body. The Squadron would welcome further members, so that if there are any model-makers in the district who would like to combine their hobby with a closer appreciation of the activities of the Air Defence Cadet Corps, No. 85 would like to place them on the waiting list."

Cadet J. R. Buchanan throws a neat little searchlight on the work of No. 87 (Collyer's School) Squadron. His report reads:

"No. 87 Squadron was formed in March, 1939. Since then many different cadet activities have been established, and among them model-making has won an important place. Several cadets were soon found able and willing to instruct the novices. As the squadron was affiliated to an Army Co-operation unit, the first model to be built was a Westland "Lysander." This was a typical team effort, and the model now hangs in the headquarters room as a squadron mascot. Since then cadets have been engaged on the construction of their own models (Magister, Kinner Sportster, and Taylor Cub), and one enterprising cadet has embarked on a Cloud "Nipper." No. 87 is fortunate in having a room in which to work at models during any free hours, and it seems likely that a more ambitious programme will be possible when more experience has been gained."

From No. 116 (Archbishop Holgate's Grammar School, York) Squadron, Air Defence Cadet Corps, comes the following report (by C. R. Owston):

"This squadron has formed a model section, which meets once a week in the school workshops.

"Most cadets are building "solids," as difficulty is experienced in obtaining balsa. Several Fairey "Battles" and "Blenheims" are on the way, as well as an "Anson," a "Junkers Ju.86k," a "Harvard,"

a " Lysander," a " Hampden," and sundry others. A lack of experience is the main defect, but this is being quickly remedied, and we are hoping to get a few duration " jobs " on the way soon, to challenge the lads of No. 110 (City of York) Squadron, and York Model Aircraft Society. The club buys THE AERO-MODELLER each month and cadets take turns in absorbing the contents."

From another school—No. 145 (Altrincham Grammar School) Squadron, Lance-Corporal B. C. Marston writes :

" We have a Model Aero Club, and on the last day of the term we staged an exhibition. We had 50 models on show, which isn't so bad for 14 members. We had two gas jobs and about 20 solids. The rest were durations, scale, or gliders."

No. 156 Squadron, Kidderminster, has sent me a page of news, which includes the information that the squadron is now subscribing to THE AERO-MODELLER, but says nothing about what models are being made. Perhaps we shall hear next month?

Some squadrons, such as No. 86 (Southgate) have the advantage of personal instruction by experienced men like Mr. Rippon (who, it is interesting to note, was secretary of the Blackheath Model Flying Club in 1911, and had as a young member a certain L. H. Slatter, who is now Air-Commodore, O.B.E., D.S.C., D.F.C.). When personal instruction of that quality is available, books are hardly necessary, for it is a truism that personal instruction is better than book learning. But many squadrons do not have that advantage, and for them the next best thing is a good book. I have just received three books of varying degrees of technicality, any or all of which will meet this need, and all of which are good. I will deal with the easiest first.

" An A.B.C. of Model Aircraft," by C. S. Rushbrooke, costs 2s. 6d., and, as its name implies, it is written for the complete novice. It starts with advice on the selection of a model for the first attempt, and goes on to deal with materials, tools and methods before describing in detail the actual construction of the model. Useful features are a chapter on lift and theory, a vocabulary of aeronautical terms terms and a list of suppliers of materials. The book contains detailed instructions for the building of various models, and can be recommended as ideal for the beginner.

" Scale Model Aircraft That Fly," by H. J. Towner and Howard Boys (3s.), is for the modeller who has got over the first easy stages and wants to make something more like the real thing. The authors start by pointing out the not always well-known fact that flying scale models resemble their full-size prototypes only in proportions and general outlines, and that in order to get these and still make the machine fly the model has to be constructed on quite different lines from those of the original. Aerodynamics and theory are dealt with so thoroughly and so simply that these parts might well be of value to those who are beginning to learn about full-scale aviation without the advantage of previous experience with models. The qualities and possibilities of rubber motors are dealt with faithfully, and to encourage the builder to do his work thoroughly Mr. Boys concludes with some advice on him to photograph models so as to make them appear on the print just like full-size machines. Four full-size scale plans of easy-to-build scale model aircraft that fly are included with the book.

I hardly feel competent to review " The Design of Wakfield Models," by S. B. Stubbs (1s. 3d.). The author says that his treatise has been written with a view to enabling the average aero-modeller to design his model on scientific lines. The text, with its page of formulæ, seems to assume a high degree of mathematical knowledge on the part of the reader, but as I know from going round and talking to them, that the average aero-modeller is a person of high educational attainments, I have no doubt that most of them will be able to profit by it. But this is definitely a book for the experienced modeller and not for the beginner.

All these books can be obtained through booksellers, the distributors to the trade being Horace Marshall and Son. I recommend squadrons to add them to their libraries.

In order to encourage you to send in interesting reports I will present a copy of any one of these books to the writer of the best report each month.

Now that it is permissible to mention that the weather was a little cold during the early part of this year, perhaps I may ask how many modellers fitted skis to their models during the time when the snow " lay round about, deep and crisp and even? " I should also like to know if any more squadrons are making scale models for instruction in the identification of aircraft. Don't forget that, in addition to being interesting work, that might be a source of additional income for the squadron.

Special notice to all members of the Air Defence Cadet Corps : Next issue will contain full-size scale plans, and complete building instructions, for the " Air Cadet," an easy-to-build duration 'plane, specially designed for Air Cadets by Mr. C. A. Rippon.

SOLID SCALE MODEL AIRCRAFT.—*Continued from page* 214.

Models would show these men in much simpler fashion than silhouettes " the shape of things to come " !

If any of our readers who make models of German military aircraft would care to loan them for this purpose, an extremely useful outlet for their enthusiasm might be found. At the same time these younger members would be " doing their bit."

I realise that lack of plans of these aircraft is the chief difficulty at the present, but I believe a certain publishing firm is even now preparing to overcome the serious shortage of scale military plans for the " solid " modeller by the provision of a book of plans of modern fighters and bombers.

I might have more news for you next month. How nice it would be to be able to purchase plans of all the latest military aircraft drawn to a standard scale!

THE NATIONAL GUILD OF AERO-MODELLISTS

HELLO! Hello! Hello! fellow aero-modellers. This is Dudley Ship calling. Just back on leave from France, where I have been since the early days of the war. I'm still hon. secretary of the N.G.A., although all the clerical work is now being done from THE AERO-MODELLER offices.

Now that we have completed our first year's insurance, what have you got to show for it? Several thousand members, including nearly 450 owners of petrol 'planes. Whilst that was a good start for our first year, it is nothing like *good enough*, when the Editor tells me that the certified net sales of THE AERO-MODELLER exceeded over 20,000 copies per month last year! The first thing is to tell you how we have got on in regard to claims. Our experiences were really quite interesting. Our underwriters settled a claim for as little as 3s. 6d.; and they settled one for close on £30. Here are some particulars:

On behalf of Norman Lees, of the Halifax Club, a claim for 3s. 6d. for a broken window pane was paid—that's better than hitting the Crystal Palace!—whilst we dealt with a claim on behalf of Mr. Gent, of Harrow, and one on behalf of Mr. Bream, of Ruislip, for an amount of £2, the damage in this case being by his petrol 'plane to a car owned by Mr. Trevithick.

The claim for just on £30 was paid to a lady who suffered injury to her left eye caused by a rubber-driven 'plane. The incident occurred one Sunday in July in Hyde Park. The Guild member concerned, Mr. Faulkner, was flying a 4 oz. biplane, which, although it made a normal flight, concluded same by hitting the lady, who was one of the bystanders. Most folk would have guessed that any substantial claim would have arisen through an accident caused by a petrol 'plane. But as things turned out, the largest claim originating from the flying of this type of model was the one against Mr. Bream, as noted above.

This month the membership form, by special arrangement, had been printed on the back of the blue print of the "Hampden" given away with each copy of this issue. Now this is all very subtle! You have read that the Editor has been inviting people to tell him just what they think of THE AERO-MODELLER! (I note he doesn't ask them to say what they think of *him!*), and apparently several readers have said that they don't like tearing the back cover off their copies to make use of the form; so this time it has been printed on the back of the plan. Before anybody rushes into print and wants to tease the Editor as to what a solid modeller is going to do if he wants to keep the plan, let me point out that builders of solid models are not insured under our Insurance Scheme! And that brings me to one or two queries which have been raised by readers, and as I understand there are a great number of new ones since the N.G.A. third-party scheme was launched last year, I think I had best conclude these notes by setting out a few instructions for readers to refer to when filling in their membership forms.

The full terms of the insurance policy are set out on the back inside page of this issue. The insurance is underwritten by Lloyd's, and an unlimited number of claims may be dealt with. Models *themselves* are not insured. The insurance is for third-party claims arising in connection with members' flying models. This answers several members who sent in one form to cover two persons—father and son, or two brothers—sharing their models and a copy of THE AERO-MODELLER each month. Each member who wishes to be insured *must* complete his *own* form, and where there are two persons sharing an AERO-MODELLER one of them can be insured by buying *one* extra copy of THE AERO-MODELLER and paying twice the normal subscription. This is quite clearly set out in the notice between Forms 2 and 3 on the membership form (which inclines me to (tactfully, I hope) remind readers that it does save *such* a lot of trouble and correspondence if they will just read through their forms before filling them in!

Now here's a point about the transfers. Some members rushed off last year to tell us that they had all been printed the wrong way round—because they thought the transfers had to be placed face downwards! So here are the correct instructions as issued by the makers:

"Soak the transfer in cold water for three or four minutes. With the "backing" still in place, position as required, with transfer the right way round, facing you. Place one finger on the transfer and gently pull the backing away from underneath, smoothing transfer into position. Allow to dry and apply a small quantity of high gloss. (Tissue paper should be taken off *after* the backing paper has been removed.)"

Now for the petrol 'plane members. First of all, let me say that there are not nearly enough of these in the Guild. We know pretty well the number of petrol engines sold each year, and we know that sales considerably exceed 450 per annum. Since petrol engines have been on sale in this country for several years, it is obvious that there must be several thousand in the country now. All members of clubs affiliated to the S.M.A.E. who fly petrol 'planes must register them with the Society and obtain a registration number from the Hon. Competition Secretary, Mr. J. C. Smith, 1 Treen Avenue, Barnes, London, S.W.1. The Society accepts N.G.A. membership as proof that the member is insured against third-party claims whilst flying petrol 'planes. Readers should, therefore, first join the N.G.A. and then, when applying for S.M.A.E. registration, enclose their N.G.A. membership cards. *It is not sufficient for a member to give his membership number, he must send his card.* Last year's membership cards were printed in red; this year's are printed in blue.

Now my space is up, and very soon my leave will be up too! (What a pity the N.G.A. does not offer a third-party insurance against being hit by a Nazi bullet, as well as a petrol plane!) However, maybe I shall see this war through, and if so I shall once again be back at my old job issuing membership cards. Now don't forget to send all applications to THE AERO-MODELLER offices, and let's have a real drive this year to get 101 per cent of the readers of THE AERO-MODELLER enrolled. 101 do I hear you query? Yes, that's quite right. What about those brothers and sons who share copies of THE AERO-MODELLER? Actually it *is* possible for the membership of the N.G.A. to exceed the circulation of THE AERO-MODELLER—so why not?

CLUB NEWS — By the "CLUBMAN"

TURNED out nice again, hasn't it? I thought when last knocking out these notes that we were having a spot of bad weather, but the last two or three days have put the kibosh on anything we had before. As I write this the whole country is at sixes and sevens with the snow hold-up, and I have seen more snow in one lump than ever before. It will not be giving my location away when I say that I have measured 17 inches of the stuff in my garden. (Huhhuh—he's got a garden!)

Still, I suppose most of you will have been employing the enforced detention in building those models we seem to hear so much about—and never see. You know, that's one of the amazing things in this game. Wherever aero-modellers gather one hears wonderful descriptions of such and such a model—but I wonder how much of this is the expression of a dream that never seems to get finished, or in some cases started. I know I am a bad offender in this respect, and would be the most prolific builder in the world if I carried out all the plans talked about.

Indoor flying certainly seems to have captured the imagination these days, and the many clubs now running meetings of this sort have found that much is to be learnt from this sphere of aero-modelling. I certainly think that it is the easiest—and least heart-breaking—method of testing scale models, and the reports culled from many sources seems to bear this out; I think we shall soon see a specific ruling as to length of line, height of pole, etc., when national records can be attempted. It is no use attempting such figures until a measure of standardisation has been reached, but I feel that the institution of record classes would give an incentive to this very promising baby of ours. Those who have yet to try this type of model flying had better get the omission remedied, as I can promise them plenty of fun—and a lot of learning.

I shall be very interested to see the outcome of the "cash prize" controversy, and I am glad that the whole of the affiliated body is to be given the chance of voting on the matter. This method of postal voting is obviously the fairest way in which to take a nation-wide opinion, and it is a pity that the time factor does not permit of greater use being made of this system. I have my own views on the whys and wherefores of cash prizes, but it would not be fair to say one way or the other here until the question has been voted upon.

The new affiliation fee should be welcomed in all quarters. Obviously, continual fluctuation of memberships will make for awkward bookkeeping, and a flat rate will save a lot of head-scratching. A word of advice might not be out of place here regarding the clause whereby the Emergency Committee have powers to consider applications for a reduced fee in special circumstances. Obviously, some clubs have been hard hit financially with the loss of members to the Forces, and where such clubs find a guinea rather a high demand on their resources, the Committee will discuss means by which these clubs will retain their affiliation. The aim of the S.M.A.E. is to retain all the present affiliated clubs, and to add others to the list, and I can assure you that any justified cases will receive the fullest consideration. But, please don't do what a certain secretary did when I mentioned the new scheme to him, and jump at the chance of getting a cheap affiliation. You will have to make out a *bona fide* case for consideration!

Reducing the required age for official timekeepers to 16 will help in many clubs where the regular "18 and overs" have been called away. Undoubtedly, many youngsters have very keen eyesight, and, providing the clubs themselves elect chaps they can rely on, there should be no reason why the present concession should not remain.

I see that Sir Kingsley Wood has been invited to become a Vice-President of the S.M.A.E., and I trust it is not too much to hope that, in spite of the enormous amount of work he is now undertaking, we may be able to announce his acceptance of this appointment. That he is not uninformed of the value of aero-modelling was evident from his support of the King Peter Cup event last year, and it is very gratifying to know that such men are interested in our hobby and ourselves.

A report this month from the ISLINGTON MEN'S L.C.C. EVENING INSTITUTE M.A.C.—(yes, it's a heluva long title, but I am bound to give it in full first go off!)—gives food for thought. I'm inclined to think that here is an opportunity for many other like institutions to embody aero-modelling in their curriculum, and I recommend them to give it a trial. (The Cardiff report also gives point to this matter, they having found much benefit from having combined with the local Y.M.C.A.).

The Islington body commenced work at the Spring term, and the L.C.C. has been made aware of the value of the activity from all aspects, and have approved the subject as one of the Institute Classes. Meetings are held every Wednesday, under the guidance of Mr. M. R. Knight (never 'eard of 'im!), and what with an approved air-raid shelter and a canteen these chaps seem to be on clover, and an invitation is extended to all. Contact can be made through the Robert Blair School, Blundell Street, Hollaway, N.7.

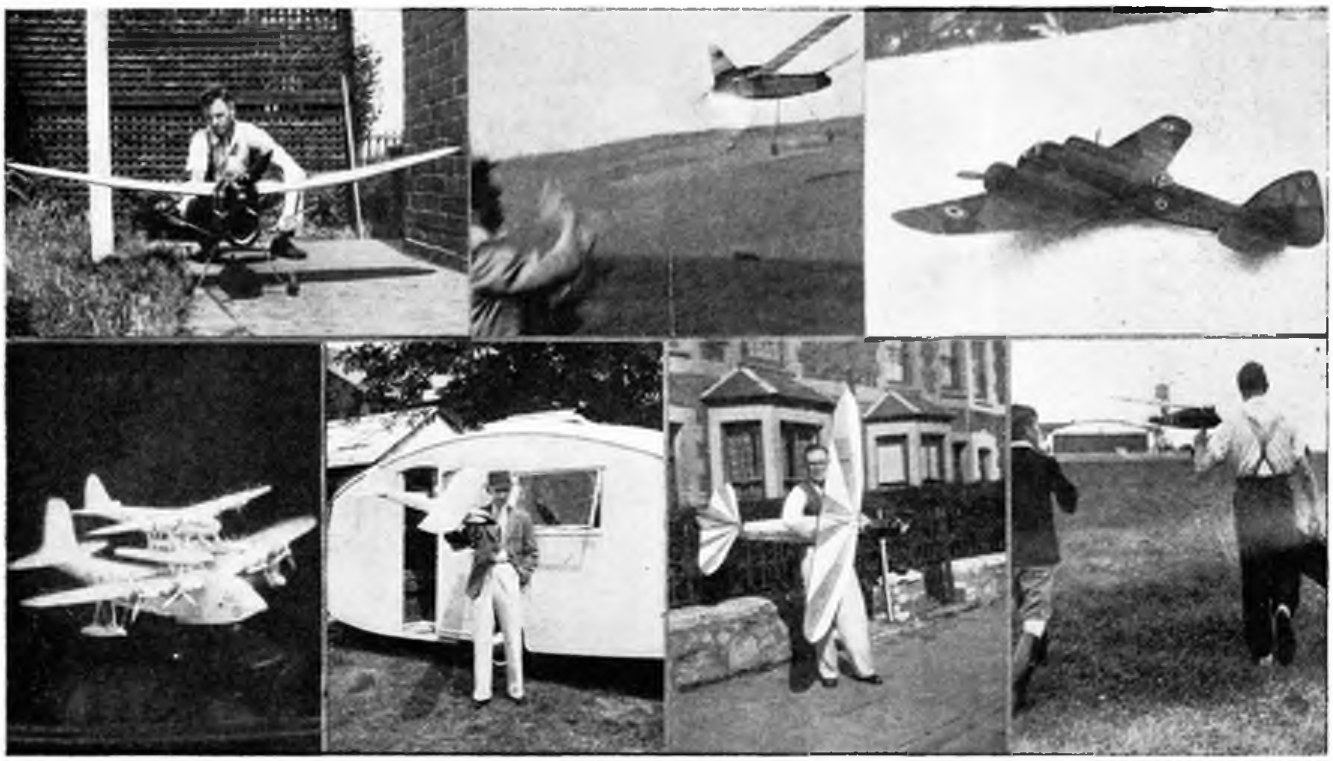
The BEDFORD M.A.C. opened their new club-room—at the back of the Rose Hotel, High Street, Bedford—with an exhibition. About 90 models were on show, and pole flying was tried for the first time. Mr. MacBean put up the highest time of 74 sec., with a ¼ oz. stick job; Mr. Jackman did 48 sec. (or should I say, his model did), while Mr. Darlow's Leopard Moth clocked 25 sec. The Mayor of Bedford has generously consented to become President of this club.

Another new club to commence operations is the CHELTENHAM M.F.C., with, so far, 16 members. Others interested are asked to get in touch with Mr. K. E. James, at 9 Berkeley Place, Cheltenham, Glos.

The HARROW M.A.C. have decided to carry on, and to reaffiliate to the S.M.A.E. The annual general meeting was held, when the position of the club was found to be very satisfactory, and subscriptions were reduced to 10s. per annum for seniors, and juniors 5s. Mr. H. R. Hicks won the "Majora" Cup, with Messrs. Young and Peterson tying for second place, and Johnson third.

Mr. A. Debenham, of the HINCKLEY M.A.C., sends in an interesting photo of—I think I'm right—the Burnelli Flying Wing built by him. This looks a nice spot of work, but I am told I must not ask how it flies, as his wife has commandeered the model until the dining-room table has been repolished! Now, where have I heard like comments before?

The NORTHERN HEIGHTS M.F.C. held the second heat of a pole-flying competition on January 6th,



(Top left) Mr. Mollison (Stockton-on-Tees M.A.C.) and his Chester Racer. Note string by which camera was worked for this " home-made " photo.
(Top middle) " Action. Camera! " A fine study of Mr. Hill's (Croydon and D.M.A.C.) pusher type model away for a flight of 95.3 sec. Model is three years old.
(Top right) Nice-looking Blenheim built by D. G. Sutton-Smith, secretary of the Wallington M.A.C.
(Bottom left) The " Mercury and Maya " built by Mr. W. Plumb, of Deptford. Over 100 hours were spent in building this nice piece of construction.
(Bottom right centre) Bernard Morgan, of the Cardiff Club, with the " Red Zephyr " built by him. A very creditable piece of work, performed, as you can see, under difficulties.
(Bottom left centre) Mr. C. E. Powell, of Winchester, and one of his six large models. Query? Does the caravan act as hangar!
(Bottom right) K. L. Stothers giving it best after a day out in this beautiful climate of ours. Wet, weary and worn!

for models having a maximum span of 18 inches. Mr. A. E. Quantock broke the existing record with a flight of 105 sec., closely followed by Mr. Bridge with 104 sec. Lectures have been well attended, and some interesting items have been on the agenda, Mr. Collins discoursing on folding airscrews, while a discussion on the inherent inefficiency of airscrews has brought some ideas to the surface. It is likely that some form of " paddling " propulsion will make an appearance! Many new members have been roped in since the war commenced, while the " knitting force " is going great guns.

L. Bowmer, of the NEWCASTLE-ON-TYNE M.A.C., sends in an interesting snap this month of an 8 ft. glider. This employs a tricycle undercarriage, the fore wheel being pneumatic, while a time fuse is fitted for the dropping of parachutes—smoke-screen equipment also being carried. Average flight is two minutes from a 200 ft. line. I can endorse Bowmer's statement that the flying of these big machines is very fascinating.

To celebrate the first anniversary of the SPELDHURST (Kent) M.A.C. a dance was held, at which Dr. and Mrs. Thurston presided. Mrs. Thurston presented the prizes to the 1939 winners, and spoke in high tribute of the progress made by the club in its short existence. Dr. Thurston also congratulated the club, principally in having for its President the Air Minister, Sir Kingsley Wood.

The WALLINGTON M.A.C. is progressing well, with membership increasing. Like all other clubs, however, more are welcomed, so if there are any unattached aero-modellers in the district, get in touch with these chaps. A new departure, outdoor pole flying has been tried by this club, and good results obtained.

Gliders are receiving a lot of attention in the CROYDON AND D.M.A.C., who are also conducting indoor flying events. A recent competition round the pole was won by a time of 79 sec., the winner getting a couple of buckshee tickets for the local theatre! An auction sale in aid of club funds was very well supported, and financially successful.

The Annual General Meeting of the LANCASHIRE M.A.S. was held in January, when the usual business was conducted and officers elected. The 1939 Committee was re-elected, together with four more members to keep up the expected reduction in numbers owing to calling up, etc. A very satisfactory balance sheet was passed, and the foundation of the society is certainly very sound. The annual club championship trophies were presented to Messrs. A. Tindall and J. Taylor, senior and junior champions respectively.

As it is intended once again to combine the club competitions with the S.M.A.E. calendar, it has been agreed to eliminate entry fees to all club events, thereby cutting out a double call on the pockets of the members. I can recommend this scheme where such combined events are

held. The records list for the 1939 season is certainly imposing, this club winning the National Gliding Cup, placing third in the Plugge Cup, and won innumerable prizes in the many inter-club events attended. It will be remembered that this club had two members in the British Team for the King Peter Cup. List of records is as follows :—

Duration (Junior), W. F. Rains ...	18	min. 50	sec.
Gliding, H. Hill	14	,, 38	,,
Indoor, H.L., C. S. Rushbrooke ...	5	,, 10	,,
Indoor Pylon, P. L. Smith	2	,, 4	,,
Seaplane (Junior), J. Taylor ...	1	,, 10	,,
Seaplane Biplane, C. S. Rushbrooke	1	,, 2	,,
Flying Scale, F. Bailey	1	,, 5·5	,,

The indoor pylon figure has since been raised to 2 min. 38 sec. again by Phil Smith, while Rushy has clocked 47·5 sec. with a scale model round the pole. Indoor meetings are proving very popular with the members; also many other clubs in the district, who have been invited to participate.

Members of the STOCKTON-ON-TEES M.A.C. are building a communal petrol model during the winter months. A member serving in Egypt is still finding plenty of fun in his hobby, though he states that sand and wind do not agree too well with models. The wind is a steady 30—40 m.p.h.—and I always thought you had to run rings round yourself to create a cooling draught! Or am I mixed up with " the inscrutible smile of the Sphinx, and the camel and its hump " ?

Mr. J. Melbourne, of 22 Alfred Street, Ebbw Vale, Monmouthshire, has formed a club in his district, and would be pleased if other clubs in that area, also anyone interested in joining the club, would get in touch with him.

A party held by the WASHINGTON M.A.C. was quite a success, and a small research laboratory is being equipped. The swing away from scale models is marked, and a modified Fillon Wakefield is under construction. The secretary, however, has dodged plotting out the wing ribs for same per slide rule!

The annual general meeting of the CHEAM M.A.C. was well attended, in spite of evacuations and enlistments. Alternate Saturday evening meetings at the club-room have done much to preserve the enthusiasm fostered on the flying field, and new members will be welcomed on application to Mr. S. Kelsey, at 120 Ridge Road, North Cheam. Flying has been somewhat restricted by the blue-pencil weather, but rumour credited several gents with hush-hush jobs on the stocks—while Elliot's benzine-breather has a lift like the Empire State Building!

Any evacuees or others interested are asked to get in touch with Mr. R. Carter, of 227 Harwood's Road, Watford, Herts., who is secretary to the WATFORD M.A.C.

Mr. E. J. Taylor, of the TORQUAY M.A.C., won a flying event held on Boxing Day—wot a 'ero—by clocking 96 seconds in a nomination contest, the required time being 95 sec. Near enough, I think! He won the cup presented by Miss P. Ward, the only lady member of the club. A member, now in the R.A.F., clocked 174 sec. just recently, which is very good for a site overlooking the sea. Water has a disastrous effect on thermals, etc.

Though the individual successes of the BARNES AND D.M.A.S. were negligible last season, the team spirit was 100 per cent, as proved by the fact that they held on to the fourth position in the Plugge Cup event right through the season, and this at their first attempt. Club points for the club Taylor Shield were :

W. W. Preston ...	...	20 points.
G. Blackman ...	...	14 ,,
S. Wincott ...	...	7 ,,

After a temporary collapse, and the loss of several prominent members, the WEST SUSSEX M.A.S. has got going again, and are holding weekly indoor meetings at Littlehampton. The club ground has been lost, but Messrs. Warring and Clements both put up over two minutes in misty weather recently on a suitable spot they discovered. Indoor flying is in full swing, though the smallness of the room restricts the length of line to 3 feet.

Recent competition resulted as follows :—

SCALE MODEL EVENT.

(Span not exceeding 16 inches).

F. W. Gates (average of 3 flights) ...	...	30·2	sec.
T. O. Clements ,, ,, ...	...	20 6	,,
Mrs. Clements ,, ,, ...	...	16·4	,,

(Best time, and new record, 36·2 sec. by F. W. Gates).

FUSELAGE DURATION. (Span as above).

R. Warring, 108, 105, and 99 sec.

F. Gates, 107 and 79 sec.

(Warring's 108 sec. new record).

The club records for the 1939 season are :—

H.L. Duration, R. A. Byatt ...	6	min. 20·6	sec.
R.O.G. Duration, R. Warring ...	5	,, 8	,,
Seaplane, R. Warring	2	,, 6·4	,,
Gliders, R. Warring	6	,, 58	,,
Ladies, Miss Offerd	1	,, 45	,,
Junior H.L., K. Colbridge	1	,, 44	,,

The NOTTINGHAM AND D.M.A.C. have fixed three events for 1940, winch-launch Gliders, Wakefield, and Semi-scale. It is hoped to hold two exhibitions before Easter, and the club is going on quite well in

spite of the usual difficulties. Mr. Lowe, who is well known in the aero-modelling world, is now with the R.A.F.

A mistake has been made in the notification of a change of secretaryship in the SWINTON AND D.M.A.C. Actually the change was in the press secretaryship, so will all please note that the club secretary is still Mr. L. D. Mellor. A very practical lecture by Mr. C. S. Rushbrooke (" Rushy " to you) was given recently, and arrangements are being made to secure more speakers. A friendly match between the Swinton and Ashton clubs has been fixed for this month, taking into consideration both duration and a team class. The recent technical lecture has evidently taken effect slab-siders taking a back seat to streamliners.

A series of new events are to be tried by the NORTHAMPTON M.A.C., including weight-lifting, tape-jumping, directional flying, also aerial golf. A workmanship competition held in January was won by C. Luck—though I am assured that there was no luck in his success! S. Smith was placed second, with a junior, R. Chesterton, third. I like your transfers, Northants!

Mr. McWeenie, of the SOUTH BRADFORD M.A.C., won a nearest to thirty seconds event with a time of 27·5 sec., runner-up being Mr. Bradley, 26·6 sec. McWeenie also won a duration event held the same day with a time of 45 sec. Affiliation to the S.M.A.E. has been discussed and deferred. May I hope that this matter is now taken up again, with the new affiliation fee in mind.

Meetings of the EDGWARE M.A.C. are to be held every fortnight, from Sunday, January 7th. The subscriptions, which were lowered to 6d. per month on the outbreak of war, have been advanced to the original sum of 3d. per week. When giving her report on the balance sheet, Mrs. Scrarisbrick, hon. treasurer, announced that they spent over £8 on prizes last year. This sum may look small to some of the big clubs, but as they have been going only three years, and with a club membership of about 35, it is rather a lot for the club to produce from the kitty.

Mr. R. Wallis has built a flying scale Taylor Cub, with skis, and it is marvellous to see it take off from the snow.

Mr. J. Morris is building a glider, and will no doubt make an attempt on the club record which he holds himself with a flight of 99 secs. Mr. F. Hiles, junr., has finished his first petrol model, and is waiting now for the good weather. Let us hope he will be as successful with it as he is with his rubber-powered models, of which he has built about 50.

An interesting competition is being staged by the ASHTON AND D.M.A.C., in which the members challenge each other over the season, and are placed on a progressive list. The member at the head of the list at the end of every three weeks receives a prize, and holds the " Progress Cup " for the following three weeks. Messrs. Jackson and Heginbottom have held the cup so far. An indoor competition, held on New Year's Day, included two pole events, resulting as follows :—

R.O.G.

C. B. Jackson	... ...	78 sec.
W. Heginbottom	... ...	77·3 ,,
W. Titterington	... ...	71 ,,

H.L.

C. B. Jackson	... ...	90·5 ,,
F. D. Ward	... ...	79 ,,
W. Heginbottom	... ...	73 ,,

The annual general meeting of the TROWBRIDGE AND DISTRICT M.A.C. terminated the first year's activity.

Pylon flying was introduced on this occasion, and in addition to indoor " specials," small outdoor and flying-scale models were put on the " line." The R.T.P. record (held by V. D. Wilkins) is 62 sec. This is actually better than the club's free-flying indoor time, but the smallness of the available space probably accounts for this. It is hoped to carry on with the regular monthly indoor meetings throughout the ensuing year. The club now boasts two lady-members, and would welcome more members of either sex, especially adult. Interested aero-modellists in the district are invited to get in touch with the secretaries, V. D. Wilkins, 6 Silver Street, Trowbridge, or L. Dallimore, 11 Westcroft Street, Trowbridge. Existing club outdoor records now stand at 118·35 sec. H.L., and 116·8 sec. R.O.G., both incidentally with a biplane.

Just because there has been no news from Bristol of late, do not run away with the impression that BRISTOL AND WEST M.A.C. have become inactive; far from it. They have been going strong with indoor meetings and competitions.

Aero-modelling in Bristol appears to have no limits to the number of newcomers to this hobby, and the club membership is increasing rapidly.

The first indoor contest was held on October 26th, and was well attended. The competitions were Indoor Glider Steering, the winners being R. T. Howse 1st, C. S. Wilkins 2nd, and Luffman 3rd; and a Pylon Nomination Contest, time 24 sec. The winner, Mr. Conn, clocked the correct time on his first flight, and won this

contest, runners up being A. H. Lee 2nd, and A. Nurick 3rd.

A Pylon Speed Contest was held on November 22nd, and the number of entries and spectators that this one competition attracted, surpassed any previous indoor meeting of the club—and the speed of the models! "Oh, Boy." The winner, A. H. Lee, clocked 39·3205 m.p.h., runners-up being R. Roy and R. T. Howse, not far behind the winner for speed.

A little amalgamation I recommended a short while ago does not seem to have been quite successful, and the former Wirral club has now gone back to its old grounds and reformed under the title of the MERSEY M.F.C., the secretary being Mr. J. Wilson, of 24 Hale Drive, Greasby, Wirrall. With most of the members over 35, and the rest mainly in reserved occupations, this club should be able to get along very well, and has the full blessing of the Clubmaan. Best of luck.

Mr. R. A. Read, of the SALISBURY AND D.M.E.S., writes :—

" Very little outdoor flying has been done during the past month, but several members have been practising pylon flying in the club-room, and perhaps a few details may be interesting.

" The pylon is 4 ft. high, and length of line 4 ft. 6 in. This is rather short, but the room only measures 14 ft. on its shortest side. Models are all 24 in. span or a trifle under, and are all home designed, with the exception of a Baby Gnome and a Cruiser Pup. The latter was considered rather too heavy, however, as the other 'planes only weigh about one ounce. The models are built as simply and lightly as possible, fuselages being made of $\frac{1}{16}$ in. square balsa, and the whole model covered in ultra light-weight indoor tissue, the wings and tail unit in one or two cases being left undoped. Props. are 10 in. diameter, driven by six strands of $\frac{1}{8}$th in. rubber 36 in. long, which will stand 1,600 to 1,800 turns. As there was a surplus of $\frac{1}{32}$ square in. indoor rubber in the club stores, some members are using 24 strands of this with good results.

" The highest time recorded so far is 115 sec., which we consider is good going, and was set up by K. Scamell. Most flights are round about the 90 sec. mark.

With regard to the absence of glide, I think this is due to the fact that the power of a rubber motor starts at a maximum and decreases to zero. Our models make one or two circuits above the level of the pole when launched, then settle down to cruising just below the top of the pole, and finally gradually sink lower and lower till they touch down, with probably a few turns left on the rubber. They don't get a chance to glide, as would happen if the power cut out when the model was circling at pole level.

" We are waiting now for some fine weather, so as to fly the R.T.P. models outdoor. Oh, boy, won't there be some flights! "

The KEIGHLEY M.A.C. boys also got the indoor bug, and two recent competitions stage resulted :—

1st.

Mr. Craven ...	...	40 sec.
Mr. Ferguson	...	35 ,,
Mr. Bailey ...	...	32 ,,

2nd.

Mr. Craven ...	...	44 ,,
Mr. Williamson	...	36 ,,
Mr. Ferguson	...	28 ,,

The club record is held by Mr. Williamson, at 65 sec. All the above flights were the average of three.

It has been decided to start a large scale advertising campaign in the district of the TUNBRIDGE WELLS M.A.C., and a flying meeting held on the Tunbridge Wells Common was moderately successful considering the cold weather. A wind-stocking measuring 5 ft. 6 in. in length was hoisted, many of the gazing rustics ranged around describing it as " a funny banner." This meeting was attended by about 150 spectators and a dozen dogs.

A reserve for subscriptions which might not be paid was included on the statement of affairs covering the last quarter!

With the passing of 1939 and the 1940 season about to commence, the members of the HAWKER MODEL FLYING CLUB wonder what the future holds in store for them.

The close of 1939 also terminated their first year of affiliation. Since the club has to find its members from within the Hawker works, and is not in the position of having enthusiasts coming to the club for membership, the results may be considered satisfactory. Eleventh in the " National Cup," and thirteenth from the bottom in the " Plugge Cup " may be said to indicate a reasonable team spirit.

It is hoped to do better things this season, but with the intensive search for more and faster full-size " jobs " the members are somewhat handicapped in finding the time to search for less ounces and more seconds on the model side.

However, they are trying to follow Warrant Officer P. R. S. Gutteridge's slogan that " if the Service Clubs can carry on so should the Civil Clubs "—though the club's not too civil! The result of the club's own " Plugge Cup " competition, known for 1939 as the

" President's Prize," showed a win for H. C. Barton, who " pipped " the Chairman for this honour by eight points. C. W. J. Dunning was third man home.

For 1940 the lads have already tried their hands at indoor roundabouts, and are arranging scale and workmanship competitions. It is also proposed to hold a social evening.

From the fun and games side of the latter event it is hoped that a substantial donation will be available to the firm's " Comforts Fund " for serving members of H.M. Forces.

With the loss of both flying fields, the BIRMINGHAM M.A.C. have been hard hit, but it is now using the old field of the Handsworth M.A.C.—last operating in 1913-15. This is known as Wasson Field, near Jubilee Colliery. Mr. Warrender, of Streetley, who asked what the Midlands clubs are doing, is asked to get in touch with the Birmingham secretary. His habit of cycling ten miles to Dunton is common to all the members of this club, and accounts for the fairly small membership which this club enjoys—or should I say " has."

The recent frosty weather did not put the NEWCASTLE (Staffs.) AND D.M.A.C. off their stroke, and flying took place most week ends. Gliders were the more popular owing to the effect that cold has on rubber. Dennis Oakes put up two flights of a minute, but this is not likely to stand for long, as several saucy-looking gliders are on the way.

Several weird and wonderful models are making an appearance in the HACKNEY M.A.C. for the original design competition—and even more fantastic designs are rumoured. It is hoped they can all fly for the qualifying ten seconds. One member has already been flying his Wakefield model in the cold and fog, nearly losing same in the mucky murk !

The bi-monthly competition for the W. and L.S. Cup of the WESTLAND M.A.C. has been held by Messrs. C. White and K. Howland, both with excellent times. (Will you please advise the times in future, Westland?) The December event had to be abandoned owing to the weather, but the A. J. Young Cup event is now under way. Satisfacation is expressed at the steady progress of the club.

The " Friendly " of the DUBLIN M.F.C., which was to be held on Boxing Day, has been postponed to March 17th. Most of the events will be run in accordance with the rules of the Model Aeronautics Council of Eire. with the exception of the Biplane and Scale events. The competition is divided into four sections : Wakefield, Scale, Biplane, and a Team event, the latter being for medium-weight models.

Mr. A. Bedford won third prize at an exhibition sponsored by the I.I.D.A., this in competition with steam engines, locos., etc.—so his win was really something to write home about. Anyway, he got a " quid," and the club got fish and chips ! Send us one over, will you —I've never had an Irish chip. I am glad to report that many new members have been roped in through the mention made in these columns.

The Cardiff club has found that amalgamation with the local Y.M.C.A. has distinct advantages, and from now on this body will be known as the CARDIFF Y.M.C.A. MODEL AERO CLUB. With about forty members, they have the use of the largest room at the Central Y.M.C.A., Station Terrace, Cardiff, in which pole flying can take place, and meetings are held there every Wednesday and Saturday at 7 p.m. Present pole record is 63 sec., held by Mr. Dingle, who also holds

the speed figure at 30 m.p.h. Other figures are 58 sec. for a 200 sq. in. job, and the scale time of 23 sec.

Outdoor activities are still going strong, and Mr. Watkins has made a fine flight with a 20 in. Club Moth of 54 sec. Bud Morgan, of this club, sends in a photo of his latest petrol model, which is a nice piece of work from all appearances. Bud lost his right hand in an accident some time ago, but it certainly hasn't spoilt his ability to build good models.

In spite of the loss of the secretary for reasons we all know only too well, the IPSWICH M.A.C. are continuing their activities. John Gorham holds the club tow-launch glider record with a time of 300 sec. O.O.S., while a very promising Fillon model was lost in a tree after test flights of two minutes. Flying takes place every Sunday at the Henley Road field, and interested folk are asked to get in touch with the members there.

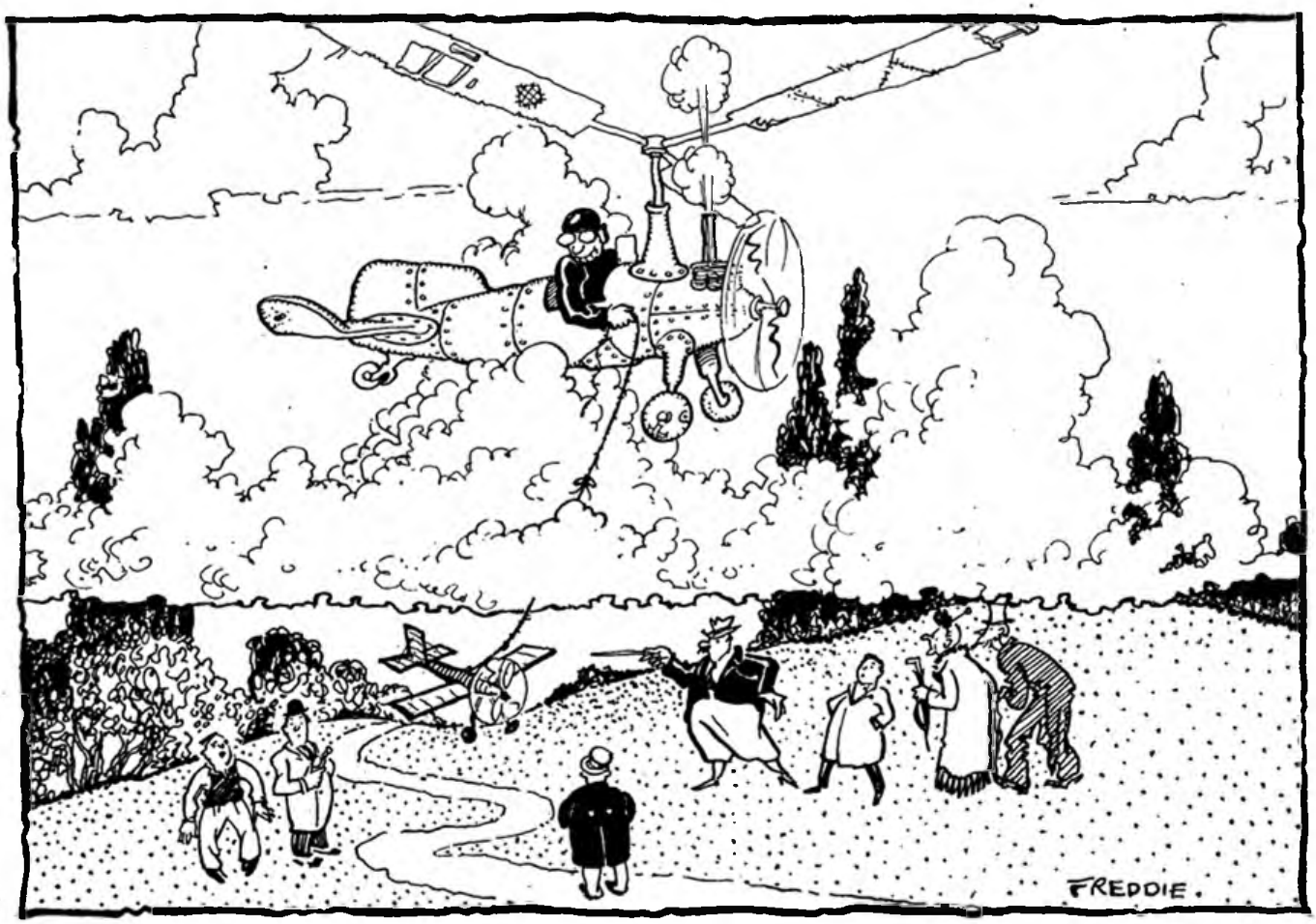
The NUNEATON M.A.C. are in luck, having the use of a super-clubroom for the cost of only 2s. per night. Some blokes get all the luck. The new room is at the old Grammar School, Vicarage Road, Nuneaton, and they look forward to lots of new faces turning up there. A big display in one of the local stores will boost membership, it is hoped.

The BRIGHTON DISTRICT M.A.C. is to hold its annual general meeting this month, and the former notice of suspension is countermanded. Three outdoor events have been held on the Chattri, and some consistent flying was witnessed in spite of arctic conditions, Messrs. Lance and Tugwell being outstanding. Gliding is also getting into the blood of these chaps.

Peterborough Model Aero Club held their first indoor contest, when there was an attendance of about twenty members. There were only four entries, several would-be entrants having damaged their machines during the testing. Results were: 1, W. Harlow (1 min. 32 sec.); 2, D. Stock (1 min. 14 sec.); 3, G. Truss (1 min. 1 sec.); 4, P. Hardwicke (21 sec.). Two records were also set up by W. Harlow, these being a duration record of 1 min. 36 sec. and a distance record of forty-two laps. Flying meetings take place each Tuesday evening from 7 until 10, at the Clubroom, Brotherhood's Social Club. Times have not been too good, as the clubroom, being small, allows only a five-foot diameter circle for the line. Wing span is restricted to 30 inches.

The BUSHEY PARK M.F.C. held two competitions in September, the winning times being, R.O.G. 65 sec. and H.L. 82 sec. Weather was not conducive to good times. A strong social side has been kept running, in spite of black-out, etc., and three socials have been held since the start of the war.

The dance staged by the HORNCHURCH M.A.C. was such a success that another is to be held on February 28th. These affairs are held in aid of the club's "Soldier's Gifts" Scheme. A free "bun-fight" was also a big success, and the secretary tells me he never knew they had so many members. I wonder how it is we always get the biggest turn-ups to a buckshee do? Mr.



"OUR LOCAL MEMBER BREAKS THE CLUB RECORD"

(Top left) The man and his model. Mr. Bell, of the Northern Heights Club, with the model that has a wonderful record. Top duration in the 1939 Wakefield Trials, lost on its first flight in the Weston Cup, and has only finished one contest, being lost on every other occasion.
(Top middle) A 50-in. Lysander built by 16-year-old G. De Renzi, of St. John's Wood.
(Top right) Nice model of the Burnelli Flying Wing built by Mr. Debenham, of the Hinckley Club.
(Bottom left) A lone hand and his Fairey Facula. Mr. I. H. Sercombe, of Devizes.
(Bottom middle) An 8 ft. span glider built by L. Bowmer, of the Newcastle-on-Tyne Club. Note the bike trailers in the background.
(Bottom right) A line-up of models at Speldhurst.

Shaw, of Aldersbrook, gave a fine show of films to the club, including views of the Wakefield, 1938, and the 1939 Trials. A club magazine is being produced by this club, to be issued monthly. Mr. D. A. Gordon has been elected to the S.M.A.E. as assistant secretary to Mr. Cosh. Congratulations!

Since the last announcement from the STONEYGATE M.A.C., advising the change of address of the secretary, Mr. Stothers, he has joined the R.A.F., and the affairs are now being conducted by Mr. H. S. Hodgson. I am not, however, advised of this gentleman's address, so shall be glad to hear of this next month. Owing to many of the members being around the twenty stage, activities have had to be curtailed somewhat, but flying is still being done at the Stoughton field, even with a temperature of 14 degrees of frost! Mr. Dunmore has produced a remote-controlled petrol model, in which the throttle, timer and choke controls are carried back to to an instrument panel in the cockpit, and work very satisfactorily.

R.T.P. times are going up in the VICTORIA M.A.C., and with a pole 2 ft. high, and a line 3 ft. long, the 100 sec. mark is being consistently beaten. Best time to date is 112 sec. An inter-club competition with the Dulwich chaps resulted in a win for Mr. N. Guy, of the V.M.A.C., with 110 sec., J. Wrench, of Dulwich, placing second and J. Guy, Victoria, being third. This club endorses and supports my remarks regarding "vindictive competition," and wish, as I, that we may soon see an end of this sort of "cattiness."

The WIRRAL M.A.S. report the breaking away of the Mersey Club, reported earlier in this column, and advise of an exhibition to be held during February in Birkenhead.

No. 374, SKYBIRD M.F.C., report little flying, owing to weather and evacuation. The field is not conducive to high times, anything over 40 sec. usually ending up in a tree. However, models are being built in readiness for the season, and a Wakefield is already on the go. One member has fitted up a model with skates made from $\frac{1}{8}$ in. balsa edged with sheet aluminium, and gives good reports of take-offs from ice.

The HAYES AND D.M.A.F.C. have been holding some very interesting indoor flying meetings on Sunday mornings at their headquarters—the Wakefield Hall at Hayes. These meetings make a very popular substitute for outdoor meetings during the bad weather.

As an example, on January 9th some very good flying was done with duration, scale and speed models. Mr. Marshall won the prize with his scale models Westland Lysander and Dewoitine D500, and Mr. Brench was also a successful prize-winner with his twin fuselage speed model. Some twenty models were flown, and all put up a very good show.

Outdoor flying takes place regularly on Chobham and Dorny Commons, and the petrol section is still very active.

The annual general meeting and prize-giving social will be held in February at the Headquarters, when the emergency rules for the duration of the war will be considered.

The BEVERLEY AND D.M.A.C. organised a concert in aid of the R.A.F. Comforts Fund on January 26th, which was a grand success. The meeting was

supported by the presence of the Mayor and Mayoress, also the President, Major Gow, and his wife. The President thanked all who had helped in the success of the affair, which raised the fine sum of £5 15s.

The ABERDEEN M.A.C. have been having a trying time all round—bad weather for competitions—the "bloke with the black patch under his snitch" upsetting the proposed rally—and now the A.F.S. collaring the room just when indoor flying was getting going! What a life! However, arrangements are now on the go for an exhibition next February or March, and indoor competitions are on the way. R.T.P. flying will take place, models not to exceed 2 oz., and intending competitors and exhibitors are asked to get in touch with the secretary as soon as possible.

This sort of thing is doing a lot to help the chaps along with their job of work, and I shall be glad to hear of even more clubs doing their bit in this direction. Naturally, it is not every club that has the opportunity or facilities to conduct concerts, etc., but I think most of us can get up some sort of a show that would help a scheme of this sort.

Well, chaps, that's the lot for this time, and not a bad showing at all, with just over fifty club reports dealt with, and, as one of my correspondents aptly remarked, like Lady Godiva, "I must hurry to my close." (Awfulaintit!) We get nearer to the flying season, and may we hope for a decent spell of good weather after the tripe we have been served up this winter. Undoubtedly, this has been the worst one we have had for years, and by all the rules we should have a good summer to make up for it. However, the Clerk of the Weather never seems to ask the opinions of aeromodellers when dishing out his stuff, so I suppose we shall just have to hope on for the best.

Here's mud in your eye till next time—when it's thawed! Get all those super machines well oiled and the rubber lubricated, and let's show the "spoil-sports" that it takes more than a war to stop the thermal hunting. Be seeing you!

THE CLUBMAN.

Small Traders' Announcements

The charge for these insertions is 5/- each prepaid for a minimum of 30 words, extra words charged at rate of 2d. per word.

ABERDEEN.—Model Aircraft Depôt, 36 Woolmanhill, Aberdeen. Scottish aero-modellers can have every want supplied by the pioneers in Scotland. Building materials of every description, and every make of kit.

BEDFORD.—Goldings, 107 High Street. Large stocks of balsa wood and accessories, Scalecraft, Star, Flying Minutes, and Cloud kits. Joy products, carrying cases, etc.

BERKHAMSTEAD.—J. W. Wood and Son, 20 Lower King's Road. M.A.T.A. for Flying Scale, Duration and Solid kits, by Cloud, Veron, Aeromodel, Keelbild, Penguin, Skybird, etc. Selected balsa, and full range of accessories.

BIRMINGHAM.—Birmingham Model Supplies, 96 Dale End, carry full stocks of balsa, dope, tissue, wheels, kits. Flying from 1s., solids from 9d. Stockists of Skybird, Frog. Spare parts, etc.

BIRMINGHAM.—L. F. Kirby, 608 Washwood Heath Road, Birmingham. 5,000 kits in stock. Megow, Star, Guillow, etc., aero ship and galleon. Balsa wood, tissue, dopes and all accessories. Write for free list.

CHESTERFIELD.—Chesterfield's only source of supply for the aero-modeller. Has larger-than-ever stocks of all model aero requisites. Balsa, dope, cement, props., etc. Every known make of kit supplied.—Barnet Kay, 76 Saltergate. 'Phone 2324.

CHISWICK.—Bakers, 526 High Road, Chiswick, W.4. Large stocks of kits and all accessories. Birch, spruce, balsa, boat kits; agents for "Hobbies," Pirelli rubber, dopes, tissue, etc. A splendid selection to suit all.

COLCHESTER.—Kent Blaxill and Co. Ltd., 3a High Street. Balsa, kits and accessories, steam engines, Meccano, Hornby and Trix trains, agents for Handicrafts, Hobbies and Studiette materials and outfits.

DAGENHAM.—V. Cowing Ltd., 157 Broad Street, and R. Cowing and Son, New Road, Rainham. For latest kits, balsa, dopes, wire, cements, tissues, and ship models, etc.

DEVON, PAIGNTON.—H. Cove Clark, 13 Hyde Road, Stockists of "Joy Plane" products, model aero requisites, also first class selection of games, toys. Fishing tackle specialists, guns and sports dealer.

EDINBURGH.—"Calling all aero-modellers." Whatever your requirements, Frank Royle, 117 Buccleuch Street, is at your service. Fullest range of kits, balsa wood, petrol engines, accessories. Illustrated catalogue, 3d. post free.

EWELL, SURREY.—Henry Chance, 198 Kingston Road, Ewell, Model Aero Supplies. Solid, Flying Scale, and Duration kits. Large stocks balsa, dopes, tissue, Caton rubber. All Slick and O'My products stocked.

HARROW.—A. H. Matthews, 15 Peterborough Road. For model aircraft supplies, balsa wood, cements, dopes, Jap tissue, piano wire, celluloid wheels, plywoods and hardwoods of all descriptions.

HERTFORD.—Woodcrafts, Railway Street. Largest stock of model aero supplies in East Herts. 30 in. duration models ready to fly from 12s. 6d. Ohlsson and Brown Junior engines in stock. Penguin, Frog, Dixon, Scalecraft, Cloud, Club, Veron, Star, Acromodel and Megow kits are here.

IPSWICH, Suffolk.—A. J. Sneezum and Sons, 31-35 Norwich Road. 'Phone 2779 for all model aeroplane supplies. Cloud, Studiette, Tower, Veronite, Frog and Penguin kits. Price lists free on application.

LANCASTER.—Parkinson's, Sports Outfitters, The Lancaster Depot for aero modelling requirements. Solid kits, flying constructional kits, duration kits, and all accessories. Main "Frog" depot.—Parkinson's, 40 Church Street, Lancaster. 'Phone 48.

LEICESTER.—Aero-Modellers! C. Farmer can supply all your requirements. Kits, balsa, tissue, props., wheels, dope in bottles or sold loose, wire, cement, Caton's rubber, etc. Local agent for Baby Cyclone engines. Call and have a chat. The address is 183 Green Lane Road. 'Phone 27722. Also THE AERO-MODELLER in stock.

LEICESTER.—AVAN Propellers, 30 Edwyn Street. Insist on fitting an "Avan" propeller to *your* model. Balsa and hardwood for all rubber-powered 'planes. Two-bladers only. Trade enquiries invited.

LEICESTER.—Avan Propellers, 30 Edwyn Street. Modellers, we can supply you with propellers—rubber or petrol, balsa or hardwood, blanks or complete finished. Price lists. Dealers write for terms NOW.

LONDON.—Norman Jaggers, 617 Barking Road, E.13, and 346 High Street, E.12. for comprehensive aero-modelling supplies. Scalecraft, Skyleada, Cloud, C.M.A., etc., kits stocked. We run "Joy," Slick, and Studiette products.

MORDEN, Surrey.—Norry's for all model aircraft supplies, including balsa, spruce, cements, dopes, etc. Kits stocked include Penguin, Scalecraft, Aero-models, Cloudcraft, Amco, Frog. 99 Green Lane, opposite St. Helier Station.

NOTTINGHAM.—G. W. Redgate, 734 Woodborough Road, Mapperley. 'Phone 66460. For Burd, Megow, and all leading kits. "Joy," cement and dope. Best quality balsa. Write for free list. All accessories.

NOTTINGHAM.—Nottingham calling you. Hundreds of kits, thousands of feet of balsa, props., tissue, cement, dope, etc., and real advice by enthusiastic modellists' assistants. Radet Electric, 21 Arkwright Street, 243 Radford Road, Nottingham.

PLUMSTEAD.—G. H. Ayre has all model aircraft accessories in stock. All makes of kits, including Comet, Megow, Guillow, Amco, Scalecraft, Burd, Star, Cleveland; "Slick" and Studiette dopes and cements.—193 Plumstead Common Road, Plumstead, S.E.18.

SHEFFIELD.—Cabinet Supply Stores, 278 London Road, Sheffield. Kits, balsa, spares. Modellers, make "light" of the "black-out." Call and see our large and varied range of kits, requisites and accessories.

SOUTHAMPTON.—Lamerton's, 27 Bridge Road, Woolston, Southampton, the firm with nearly 30 years' experience in supplying the needs of men who want to make things. In stock: Aeromodel, Megow, Scalecraft, and Veron Kits. "Joy," Popular, "Slick," and Studiette Products. 80 sizes balsa, Dunlop rubber. Anything not in stock obtained promptly. 5s. orders carriage paid. Cash with order. Balance, if any, refunded with goods.

SOUTH BIRMINGHAM.—Modellers, good news! All model materials, flying solid and boat kits. Now obtainable from Parsons Timber Yard, 42 Church Road, Northfield, Birmingham. Also Longbridge Model Supplies, 1667 Bristol Road, Rednall.

STAFFORD.—Aircraft Models, Borough Carriage Works, South Walls, have all you require in kits, designs and materials. Est. 1936, and now have a reputation for value, quality and service. Member M.A.T.A.

STOCKPORT.—Arts and Crafts, 54 Wellington Road South. Balsa wood in strip, sheet and block. Dopes, cement, tissue, duration and scale kits.

TRURO.—John Langdon, St. Mary Street; Phone 2207. Stockists of model-aero supplies. Kits from 9d. to 70s. "Cloud," "Sweeten," "Joy Plane," and "Drome" products. Balsa wood and all accessories.

WARRINGTON.—Burton's Model Aero Supplies, 23 Bewsey Street, Warrington. Drome, Aero-models, Keelbild, Skyleada, Tower, Studiette and Cloudcraft kits. Drome, Studiette and Joy-Plane accessories. Messerschmitt 109 kits. 1s., 3s. 6d. and 4s. 6d.

WILLESDEN'S Leading Aero Model Suppliers, Woods Sports Ltd., 98 Chamberlayne Road, Kensal Rise, N.W.10. Comprehensive stocks of all kits and materials. Write for free catalogue or 'phone Ladbooke 1414. Buses Nos. 6, 46, 52 and 70 stop at door.

WOLVERHAMPTON.—The Aero Modellers' rendezvous. Start and Sons, 61 Victoria Street. Kits by all popular makers, petrol engines, etc. Selected balsa, spruce, cements, dopes, rubber, etc., and a most complete range of materials and accessories.

WOLVERTON, Bucks.—A fine selection of "Cloud" and Studiette flying kits, propellers, wheels, tissue, rubber, "Casco" glue, and all "Joy Plane" products, at Lake Brothers, 28 Stratford Road.

PRO FORMA

No Policy or other Contract dated on or after 1st Jan., 1924, will be recognised by the Committee of Lloyd's as entitling the holder to the benefit of the Funds and/or Guarantees lodged by the Underwriters of the Policy or Contract as security for their liabilities unless it bears at foot the Seal of Lloyd's Policy Signing Office.

LLOYD'S POLICY

(Subscribed only by Underwriting Members of Lloyd's who have complied in all respects with the requirements of the Assurance Companies Act of 1909 as to security and otherwise.)

Whereas NATIONAL GUILD OF AERO-MODELLISTS, per DUDLEY SHIP, ESQ., hon. secretary, of 44 Holdenhurst Road, Bournemouth, for and on behalf of its members (hereinafter called "the Assured"), have paid £..... Minimum and Initial Premium or Consideration to Us, who have hereunto subscribed our Names to Insure against Loss as follows:—

This Policy is to indemnify members of the Assured Guild (hereinafter called the "Insured Members") against all sums which they shall become legally liable to pay in respect of claims made against them for compensation for:

ACCIDENTAL BODILY INJURY TO PERSONS and/or DAMAGE TO PROPERTY resulting from any accident or accidents occurring during the period of this Policy caused through the negligence or default of Insured Members and/or persons acting on their behalf and to whom they may be responsible whilst engaged in flying model aircraft anywhere in the United Kingdom, but subject to the exclusions and conditions hereinafter stated.

EXCLUDING:

1. Injury to any person who at the time of sustaining such injury is engaged in the service of and/or acting on behalf of the Insured Member(s).
2. Damage to property actually the Insured Member(s) own or in the Insured Member(s) custody or control.
3. Injury or damage directly or indirectly caused by accidents occurring outside the limits of the United Kingdom.
4. Loss or damage or any liability directly or indirectly occasioned by, happening through or in consequence of war, invasion, act of foreign enemy, hostilities (whether war be declared or not), civil war, rebellion, revolution, insurrection or military or usurped power.

PROVIDED THAT:

1. In addition to Compensation as above, the Underwriters agree that, in the event of their requiring any claim to be contested by the Insured Member(s), they will pay all costs, charges and expenses in connection therewith subject nevertheless to the following conditions:
   (*a*) If the claim is successfully resisted by the Insured Member(s), they will pay all costs, charges and expenses incurred by the Insured Member(s) in connection therewith up to but not exceeding the sum insured under this Policy.
   (*b*) If a payment exceeding the sum insured has to be made to dispose of a claim, the liability of Underwriters to pay any costs, charges and expenses in connection therewith shall be limited to such proportion of the said costs, charges and expenses as the sum insured by this Policy bears to the amount paid to dispose of the claim.
2. The liability of Underwriters shall not exceed the sum of £5,000 (five thousand pounds) in respect of any one accident or series of accidents arising out of any one event, and is unlimited in respect of any and all accidents occurring during the currency of this Policy, except that the Underwriters shall in addition pay all legal and other costs incurred with their consent in the defence of any claim made against the Insured Member(s), but subject to provision No. 1 above.

SCHEDULE

Basis on which the premium paid by the Assured is to be adjusted:

On the total membership of the assured Guild during the currency hereof, it being understood that the said Guild comprises two classes, i.e.,

(1) Members who fly rubber-driven model aircraft.
(2) Members who fly petrol-engined model aircraft.

during the period of 12 months commencing with the first day of February, 1939, and ending with the last of January, 1940, both days inclusive, and for such further period or periods as may be mutually agreed upon.

If the Assured shall make any claim knowing the same to be false or fraudulent, as regards amount or otherwise, this Policy shall become void, and all claims thereunder shall be forfeited.

Now know We, that We the Underwriters do hereby bind Ourselves, each for his own part, and not one for Another, our Heirs, Executors, and Administrators, to pay or make good to the Assured or to the Assured's Executors, Administrators, and Assigns, all such Loss or Damage as aforesaid as may happen to the subject matter of this Insurance, or any part thereof during the continuance of this Policy; such payment to be made within Seven Days after such Loss is proved and that in proportion to the several Sums by each of Us subscribed against our respective Names not exceeding the several Sums aforesaid.

In Witness whereof We, Underwriting Members of Lloyd's, have subscribed our Names and Sums of Money by Us insured.

Dated in London, the 193

CONDITIONS

(1) This Policy is subscribed subject to the Conditions contained herein or endorsed hereon, all of which are to be deemed Conditions precedent to the liability of the Underwriters.

(2) If after the Insurance has been effected the risk be materially increased without the assent of the Underwriters the Insurance shall be void.

(3) Upon the happening of any occurrence likely to give rise to a claim under this Policy and/or upon the receipt by the Insured Member(s) of notice of any claim or of any other subsequent proceedings, notice in writing, with full particulars, shall be given to the Underwriters as soon as possible after same shall come to the knowledge of the Insured Member(s) or the Insured Member's representative.

Every letter, claim, writ, summons or process shall be forwarded to Underwriters immediately on receipt by the Insured Member(s).

N.B.—It is agreed that "Notice" as specified above, may be given by the Insured Member(s) through his (their) Agent, Dudley Ship, Esq., 44 Holdenhurst Road, Bournemouth.

(4) No liability shall be admitted and no admission, arrangement, offer, promise or payment shall be made by the Insured Member(s) without the written consent of Underwriters, who shall be entitled, if they so desire, to take over and conduct in the name of the Insured Member(s) the defence of any claim or to prosecute in his (their) name for their own benefit any claim for indemnity or damages or otherwise against any third party, and shall have full discretion in the conduct of any negotiations or proceedings or the settlement of any claim, and the Insured Member(s) shall, whenever possible, give all such information and assistance as Underwriters may require.

(5) If any claim under this Policy is also covered in whole or in part by any other Insurance, the liability of Underwriters shall be limited to their rateable proportion of such claim.

(6) The Underwriters may, by a Registered Letter sent (by or on the instructions of the Underwriters) to the Assured's last known address, give 10 days' notice of their intention to cancel this Policy, such notice to take effect from midnight of the day following that upon which the letter is posted, and no liability shall attach hereto in respect of any accident occurring after the expiration of such notice. On the expiration of such notice of cancellation the Underwriters shall on demand return to the Assured a proportion of the premium corresponding to the unexpired period of this Policy.

(7) The Insured Member(s) shall and will at all times exercise reasonable care in seeing that appliances used are substantial and sound, and in proper order, and fit for the purposes for which they are used, and that all reasonable safeguards and precautions against accident are provided and used.

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"CLOUDCRAFT"

A letter from the West Sussex Aircraft Society states:

Mr. K. COLBRIDGE broke the club's Round the Pole 3' Line Record. Flight time 40 sec. Mr. Colbridge is a junior member of 14 years of age and this was his first scale model. Also the results of a competition were as follows: 1st, 30½ sec. 2nd, 20¾ sec. 3rd, 16¾ sec.

All "Cloudcraft" models. You can build a record breaker for 1/3

• RECORD BROKEN •

Supermarine Spitfire
16 in. Span

Miles Magister
15 in. Span

H.17 Sailplane
20 in. Span

Tipsy "S"
15 in. Span

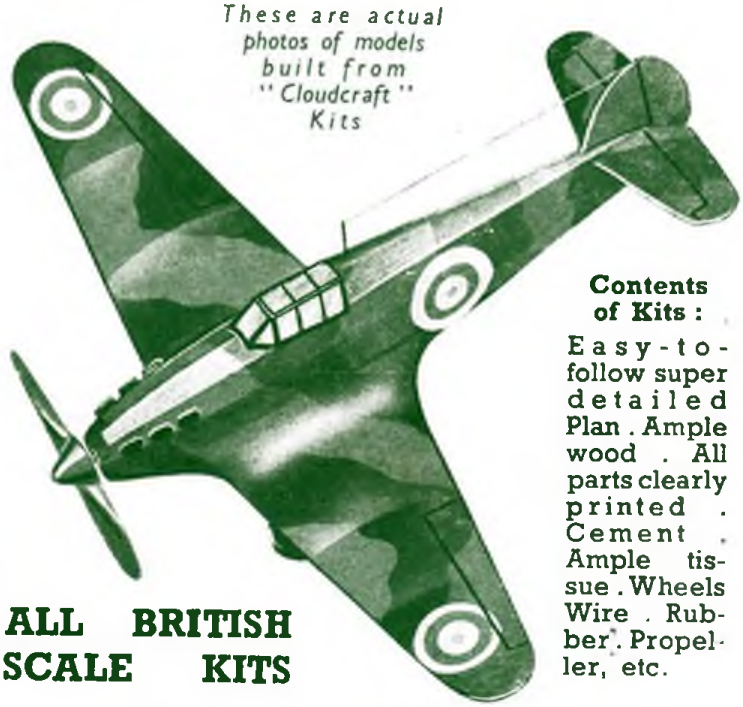
Fairey Battle
15 in. Span

Westland Lysander
15 in. Span

Gull Duration Model
15½ in. Span

D.H. Hornet Moth

These are actual photos of models built from "Cloudcraft" Kits



ALL BRITISH SCALE KITS

Contents of Kits:

Easy-to-follow super detailed Plan. Ample wood. All parts clearly printed. Cement. Ample tissue. Wheels Wire. Rubber. Propeller, etc.

D.H. Leopard Moth
16 in. Span

Hawker Hurricane
15 in. Span

Stinson Reliant
15 in. Span

Blackburn Skua
15 in. Span

1/3

COMPLETE POST - 3d.

CATALOGUE 3d. post free

DEALERS SEND FOR TERMS

CLOUD (Model) AIRCRAFT

304-6 HIGH STREET, DORKING, SURREY Telephone 2385 (2 lines)

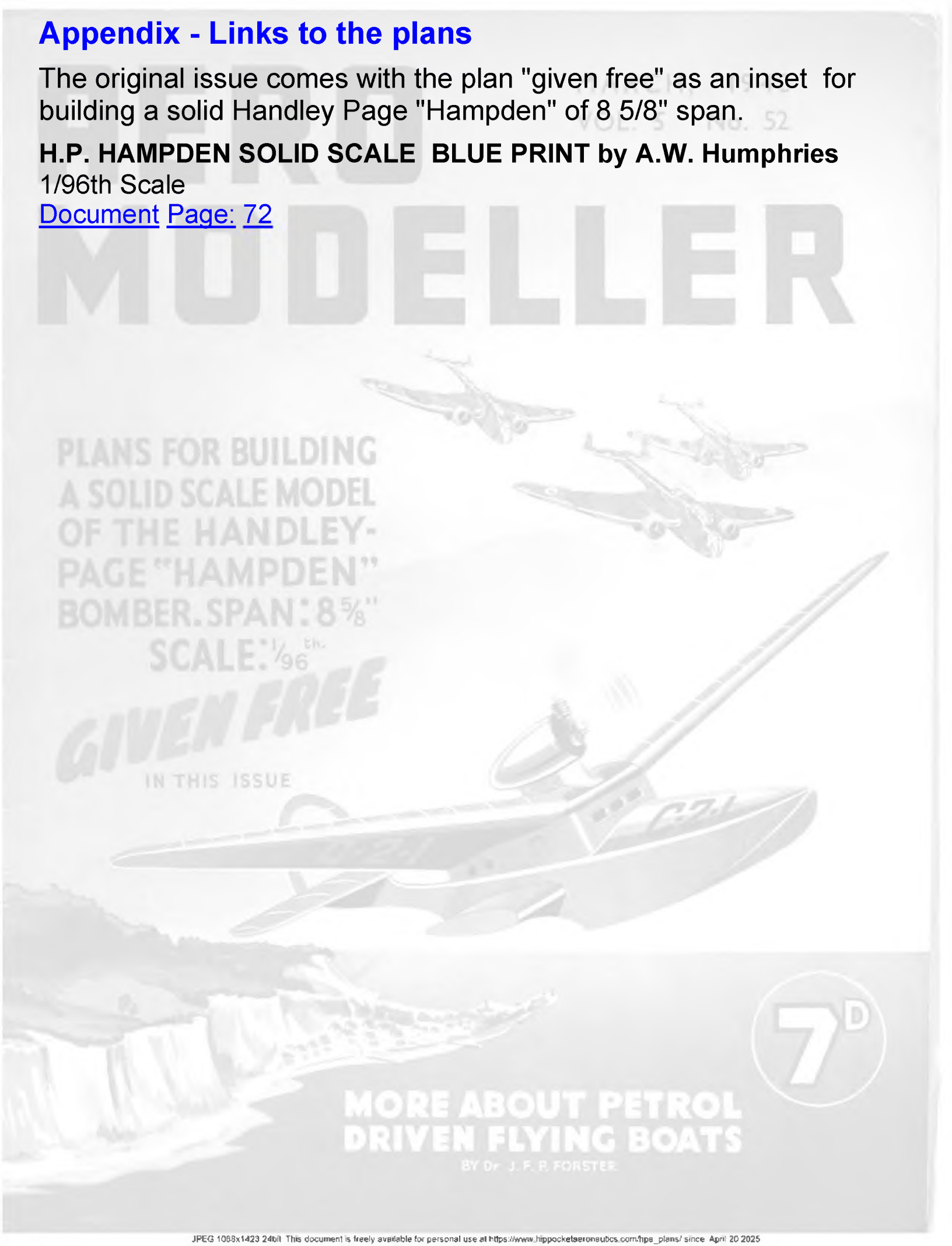
★ Wholesale Department—290 HIGH STREET, DORKING, SURREY

MODEL AIRCRAFT TRADE ASSOCIATION

Appendix - Links to the plans

The original issue comes with the plan "given free" as an inset for building a solid Handley Page "Hampden" of 8 5/8" span.

H.P. HAMPDEN SOLID SCALE BLUE PRINT by A.W. Humphries
1/96th Scale
Document Page: 72



QUESTIONNAIRE!

No..... MY 1939 WAKEFIELD MODEL

My model is a
Tractor .....
Pusher .....
Monoplane .....
Biplane .....

Its type is Parasol wing .....
High wing .....
Shoulder wing .....
Low wing .....

The fuselage is
Rectangular .....
Round .....
Oval .....
Diamond .....
Triangular .....
It has Longerons and struts .....
Formers and stringers .....
Is monocoque built .....
It is covered with .....

The wing section is .....
Root chord is .....inches
Tip chord is .....inches
It sweeps Backwards .....
Forwards .....
Is straight .....
Its plan shape is .....
Dihedral angle, top plane .....
(If any) bottom plane .....
Construction is .....
Covering is .....

Tail-plane section is .....
,, span is .....inches
,, area is .....square inches

When finished machine is
Water sprayed .....
Doped (no. coats) .....
Varnished .....
M/c circles With torque .....
Against Torque .....

Dimensions
Span .....
Length .....
Height .....
Propeller diameter .....
Pitch .....
Gear ratio (if any) .....
Motor wound from
Front .....
Rear .....

Chassis is
Bamboo .....
Size of section .....
Chassis is wire .....gauge.....
Is it retractable .....Yes.....No.....
The wheels are .....inches diameter
They are
All balsa .....
Hardwood .....
Streamlined celluloid .....
Balloon .....
Chassis track is ..... inches

The motor has ..... skeins of rubber
Size..... × .....
Each skein is .....inches long
There are .....strands per skein
Distance between rubber hooks is.....
A rubber tensioner is used .....
Or rubber is roped .....
Maximum turns on motor .....
,, ,, propeller .....
Motor run .....seconds

Weights
Fuselage and rudder .....
Wings .....
Tail-plane .....
Nose-block .....
Propeller .....
Chassis .....
Rubber .....
Total weight .....

The centre of gravity of M/c is .....% of chord from L.E. of wing
The L.E. of tail-plane is..... inches from L.E. of wing
Angle of incidence of top wing is .....degrees to thrust line
,, ,, bottom ,, ... ,, ,, ,,
,, ,, tail-plane ..... ,, ,, ,,
I certify that this M/c won 1st place in .....Competition. Time .....seconds
2nd ,, ... ,, ,, ... ,,
Its best timed flight is .....seconds. Average flight is .....seconds
Name ..... Club .....
Address .....

NATIONAL GUILD of AEROMODELLISTS MEMBERSHIP RENEWAL FORMS for 1940

FORM No. 1

Christian Name (*Block Letters*)_____ ***Surname***_____

Address_____

Whether:- RUBBER MODELLIST / PETROL MODELLIST (cross out whichever is inapplicable.)

Herewith 6d. or 1/- for enrolment as a Rubber Modellist

Herewith 2/6 or 5/- for enrolment as a Petrol Modellist.

Herewith .....pence for further transfers at rate of 2 a penny (Two transfers are supplied free)

Herewith 1/- for N.G.A. Lapel Badge

Herewith P.O./cheque No.....

Vlue .....

Name and Address of Newsagent_____

FORM No. 2

Christian Name (*Block Letters*)_____ ***Surname***_____

Address_____

Club (if any)_____

Make of Petrol Engine(s)_____

NOTE *The above two forms must both be completed and returned to:—The Hon. Sec., N.G.A., Allen House, Newarke Street, Leicester.*

NOTE *If you use FORM No. 3, and register as a REGULAR reader, your subscription will be 6d. for rubber or 2/6 for petrol 'plane membership. But if you do not wish to register as a regular reader your subscription will be 1/- for rubber or 5/- for petrol 'plane membership.*

IN EITHER CASE THE PROTECTION PROVIDED BY THE INSURANCE POLICY WILL BE EXACTLY THE SAME. INSURANCE IS EFFECTIVE UNTIL JANUARY 31st, 1941.

FORM No. 3

TO BE HANDED TO YOUR NEWSAGENT

(If you have not already registered for the regular delivery of "The Aero-Modeller" each month.)

Name of Newsagent_____

Address_____

Commencing with the April issue, please deliver or reserve for me "The Aero-Modeller" until further notice.

Signature_____ ***February, 1940***

Address_____