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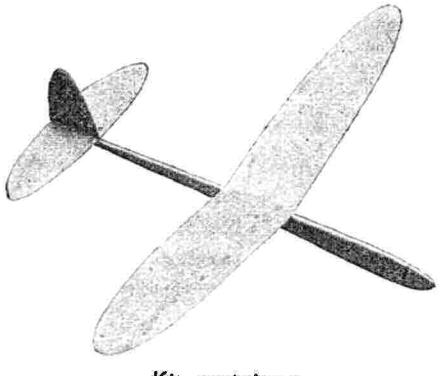

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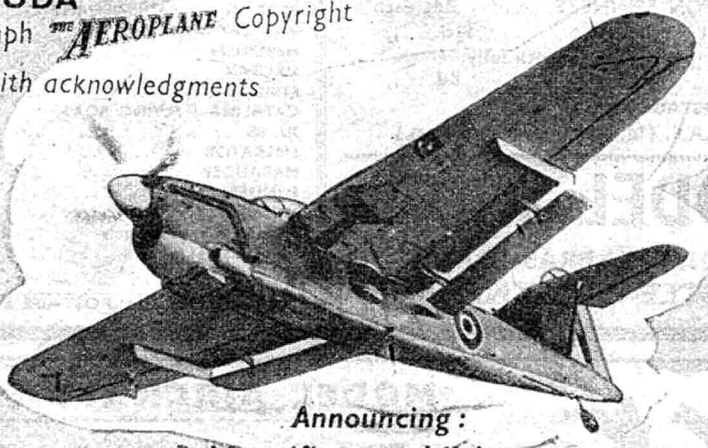

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The Model Aeronautical Journal of the British Empire

Established 1936

VOL. X No. 109 DECEMBER 25th, 1944

PROPRIETORS: MODEL AERONAUTICAL PRESS, LIMITED

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

Editor: C. S. RUSHBROOKE

ALLEN HOUSE
NEWARKE STREET
LEICESTER
Tel.: LEICESTER 65322

SUBSCRIPTIONS: INC. CHRISTMAS DOUBLE NUMBER 15/- P.A. PREPAID.

THE "AEROMODELLER" EXHIBITION

We have pleasure in announcing a forthcoming Exhibition—the first of its kind to be held in this country—which this Journal is organising early in the New Year.

It has been obvious for some time past that the Model Aeroplane Movement in this country was sufficiently large to support a "Model Aircraft Exhibition" of its own, but war-time restrictions have prevented our organising such an Exhibition any earlier.

However, the time has at last come, and we would draw the attention of all readers to the dates, times, etc.

The first AEROMODELLER Exhibition ever to be held in this country will open at 11 a.m. on Friday, January 5th, and will thereafter be open daily (with the exception of Sunday, January 7th) until it closes on Saturday, January 13th. Each day the Exhibition will open at 11 a.m. and close at 9 p.m.

As we are anxious to emphasise these dates, we are tempted to add, in proper B.B.C. language "We will now repeat this message at dictation speed"—Remember — the — Exhibition — opens — on — Friday — January — 5th — at — 11 a.m. — and — closes — at — 9 p.m. It — will — be — open — the — following — day — Saturday —, and — every — day — of — the — next — week — closing — finally — at — 9 p.m. — on — Saturday — January 13th.

Features of this AEROMODELLER Exhibition will be a large display of all types of model aircraft, including a number of well-known Competition winning machines.

In addition, the AEROMODELLER is organising a number of attractive yet simple-to-enter Competitions, for which cash prizes will be offered, full particulars of which are given on page 16 of this issue.

We would particularly draw attention to the address to which models are to be sent, and would ask for the co-operation of all entrants to these competitions by seeing that their entries are securely packed in strong boxes and despatched so as to arrive at the "Aeromodeller Receiving Centre," c/o Aircraft (Technical) Publications, Ltd., No. 7, Hanover Court, London, W.1, as near as possible to Monday, January 1st. Models will be insured by the AEROMODELLER against loss or damage during transit to and from the Receiving Centre, and whilst at the Exhibition. Models will not be insured against loss by enemy action.

A feature of the Exhibition will be a Cinema, in which will be shown throughout each day a film depicting a number of models.

Under war-time conditions, some readers may feel that it is not too easy to arrange for loan or entry of their models, but we do ask those who are able to do so, to arrange for models to be sent.

Models may be sent for exhibition *or* entry to the various competitions. Those readers who wish to enter for the competitions should apply for the appropriate entry form by sending a stamped addressed envelope to our Leicester Offices, Allen House, Newarke Street, Leicester.

The Dorland Hall is, of course, well known for the many exhibitions which have been held there, and is centrally situated in Lower Regent Street; on the left-hand side, a short way down from Piccadilly Circus.

We emphasise that the Exhibition does not close until 9 p.m. *each* evening, and therefore those London-area readers who are unable to visit it during the day may be sure of having plenty of time when making an evening visit.

To all readers we extend a hearty invitation to visit the Exhibition, see the finest show of model aircraft ever assembled under one roof, and to contribute to the success of the Exhibition by loaning or entering at least one model.

Volume IV. "Aircraft of the Fighting Powers"—Plans

We are pleased to announce, on behalf of Aeromodeller Plans Service, Ltd., that loose-leaf 1/72 scale plans of all the aircraft described in Volume IV of "Aircraft of the Fighting Powers" and in the recently published "Book of Westland Aircraft" are now available, and full particulars are given in the lists printed in the centre pages of this issue.

Owing to limitation of paper supplies, it will not be possible for some three or four months to have available loose-leaf plans of all the aircraft described in Volume V of "Aircraft of the Fighting Powers," but as soon as copies are available, an announcement will be made in this Journal.

Meanwhile, we would draw particular attention to the splendid reduction of 25 per cent. on the value of all plans orders received by Aeromodeller Plans Service, Ltd., up to and including January 31st, 1945.

In previous years we have issued coupons with a cash value which could be deducted from the total amount required to be sent when placing an order. This entailed a considerable amount of bookwork, and the filling in by readers of the appropriate coupons, and,

further, it limited the benefit of the " reduction " to the value of the two coupons published.

By altering the scheme to a 25 per cent. reduction with no limit, we have not only cut out bookwork for both readers and ourselves, but given to the former the benefit of the reduction on the whole of the order, no matter how large or small it may be.

All that readers now have to do is to total up the amount of the order they wish to place, clearly state the plans they require, and then send to us only three-quarters of the amount which would normally be payable.

Orders will, of course, be dealt with in strict rotation, as received, and early ordering is necessary to avoid delay. Special arrangements have recently been made to bring our stocks right up-to-date and whilst, in the past, we have from time to time had to admit occasional delays in delivery of individual plans, we are now able to say that at the time of going to press, good stocks of every plan listed are held, and readers may confidently order, relying on prompt delivery.

Remember, this offer is open only until January 31st, 1945—remember also that the sooner you order your plans, the sooner you can get on with the building of your 1945 model !

"Faith," "Hope" and "Charity"

. . . And the greatest of these, in the George Cross Island of Malta, is " Faith." Of the three historic Gloster Sea-Gladiators which, in the dark days of 1940, defended Malta unaided against the might of the Regia Aeronautica, only " Faith " survives. She has been presented to the people of Malta as a permanent memorial of this epic defence.

Mr. C. Rupert Moore's cover painting this month is devoted to these three Sea-Gladiators which have become known to everyone as " Faith," " Hope," and " Charity." The story of these machines is at once the most exciting and incredible in the history of air warfare. When Italy entered the war it was thought that the island of Malta, so vital through the ages to British sea power and strategy in the Mediterranean, would fall an early victim to Italian air power. The air defences of the island were, for all practical purposes, nil. On the other hand, the Regia Aeronautica was deployed in strength on the nearby Italian mainland.

At the eleventh hour, four packing cases containing Sea-Gladiators for the Fleet Air Arm were discovered by the R.A.F., and the decision was made to erect them and put up a fight. The idea seemed almost ridiculous, but the situation was desperate. And the conventional strategists had not taken into account the marvellous fighting qualities of the trusty old Gladiator.

The Gladiator embodied the Gloster Company's eighteen years' experience of fighter biplane design and can claim, on the strength of its activities early in this war, to be the finest fighter biplane ever built, as well as the last of its line. In 1939 Gladiators shot down astonished German raiders over Scotland ; in 1940 they fought in France, and in the Norwegian campaign a Gladiator squadron fought from a frozen lake against impossible odds.

But Malta was the greatest achievement of all. Here the odds were even greater than during the frozen lake episode. Four Gladiators against the entire Italian Air Force ! For two months these Gladiators took off on patrol ; broke up large formations of bombers and destroyed many of them. One Gladiator was lost. The other three fought on against even heavier odds and finally emerged supreme. Reinforcements of Hurricanes at last arrived and Malta was saved. Arduous years of air siege were to follow, but the critical weeks were over. Gladiators had saved the day !

An inspiring story and one which we have felt to be well worthy of record.

Jet Propulsion

We feel sure that readers will greet with interest the news that a model jet propulsion unit has been built and made to function with some success. Limited success, it is true—but even so it is indeed a great step towards the development of a new phase in Model Aeronautics. The designer of this unit is to be congratulated on his achievements in view of the difficulties he must have faced. All available data on turbo-combustion units is of little use when this form of propulsion is scaled down to a size suitable for models. It is a case of starting from scratch and learning by hard experience.

We were assured by experts, who were actually working on the full-size units, that it would be impossible to build a model under 12 ft. span using the form of propulsion in question. In view of our contributor's experiments, the " experts " are proved wrong, not altogether an unusual occurrence !

However, a vast amount of research and hard work has yet to be done. There will be many failures, many

CONTENTS OF THIS ISSUE

worn-out slide-rules, and many thumbs the worse for wear, before the first jet-propelled model aircraft leaves the ground. Mr. Harris is by no means the only enthusiast working on this type of project. We know of others. One, for instance, is experimenting with the "Doodlebug" method of propulsion; he also has met with limited success. There will be many others we know, all eager to further the advancement of this comparatively new aspect of Model Aeronautics. We, and our readers, will be glad to hear of their successes and their failures.

The British Model Car Club

We are pleased to learn of the formation of the British Model Car Club and wish the venture every success in the future. This Journal has on occasion given limited space to reports on the activities of model race car enthusiasts. Our Managing Editor, Mr. D. A. Russell, is himself the owner of several first-class cars. We assure our readers, however, that we have no intention of cutting down aeromodelling material in order to make room for model car news.

Nevertheless, we know from our correspondence files that quite a number of our readers are interested in model cars. While the Air Ministry ban on the flying of power-driven model aircraft was in force, we felt that the petrol-engined model race car offered aeromodellers a chance to employ usefully their stored engines. We, therefore, published one or two articles dealing with this aspect of model engineering. The response was good and we felt fully justified in taking this action.

The lifting of the "ban," however, will bring about a considerable increase in the activities of aeromodellers whose interests lie in the field of power-driven aircraft, and we do not anticipate that space will be available in the AEROMODELLER for model car articles. Furthermore, we do not consider that aeromodellers would welcome the inclusion of such articles. But, as more than a few of our readers own model cars, we have published this note so that those readers who are interested may communicate with the Secretary, whose name and address is D. B. M. Wright, "Beverley," Bawtree Road, Uxbridge, Middlesex.

Skyleada Model Aircraft.

Messrs. A. Hunt (Croydon) Ltd., whose advertisement appears on the inside front cover of this issue, inform us that under present wartime conditions many of the kits listed are bound to be in short supply or may not be available. Every effort has been and is made to effect as wide and as equitable distribution as possible, but until supplies are easier modellers should be prepared to select alternative models from those listed.

A.B.A. NEWS.

Sir Robert Bird, Bart., President, himself a keen aeromodeller, has presented to the Association a "President's Trophy" which has been allocated for 1944-45 to National Competition No. 2, Class B. (Duration—for flying scale models above ½ in. and up to and including 1 in. scale). He has also proffered a "Sir Robert Bird" trophy as one of the awards in an International Competition to be held as soon as the cessation of hostilities makes such an event possible. The Council is already beginning to plan the details of an International Competition, and aeromodellers' views on this subject would be welcomed.

A sub-committee has been appointed to investigate the possibility of holding an annual Petrol-driven Flying Boat Competition, to be held the first year near London and thereafter in other centres in the British Isles where suitable water and other facilities exist. Dr. Forster has offered a trophy for this, of which more news will be given after the sub-committee's report has been made.

The Association has been fortunate and greatly honoured by securing as Vice-Presidents: Air Commodore Sir Adrian Chamier, C.B., C.M.G., D.S.O., O.B.E., of the Air League of the British Empire; Air Commodore Oswald Gayford, C.B.E., D.F.C., A.F.C., who, as a Squadron Leader in 1933, created the world's long distance flight by making in a "Fairey" monoplane a non-stop flight of 5,431 miles in 52 hours 25 mins.; and also Air Commodore Arthur W. Glenny, M.C., D.F.C., well known to many of our R.A.F. members and who has already given valuable help at Headquarters.

A pamphlet has been prepared, with a foreword by C. A. Rippon, entitled "How to Organise a Club for Aeromodellers." It is full of useful tips for clubs already in existence and will be found invaluable to any wishing to start a new club. For the modest sum of 6d. plus 1d. postage a copy of this pamphlet can be obtained from the A.B.A. Headquarters, 28, Hanover Street, London, W.1.

The Council has appointed a Research Committee to consider the ways in which the Association can assist aeromodellers who are experimenting with new ideas. Obviously, it would be of great value if help could be forthcoming for the testing of ideas and also if a method could be found of linking up research work, so that those working on the same lines could compare notes. In other spheres, team work between scientists and the sharing of ideas has saved much valuable time and led to important discoveries. Not the least important of these, to quote a recent example, was the team work which has resulted in the discovery of Penicillin.

The Council is desirous that all aeromodellers and combinations of aeromodellers, whilst retaining their own freedom, shall be joined together in one organisation. After the war, there will be a great increase in aeromodelling and co-ordinated action will be required to obtain not only the many facilities which only united effort can secure, but also the national recognition which the aeromodelling movement so richly deserves as a great sport and hobby. The value of having a unifying national organisation which can promote, encourage, develop and protect the model aeroplane movement in the United Kingdom is too obvious to need stressing.

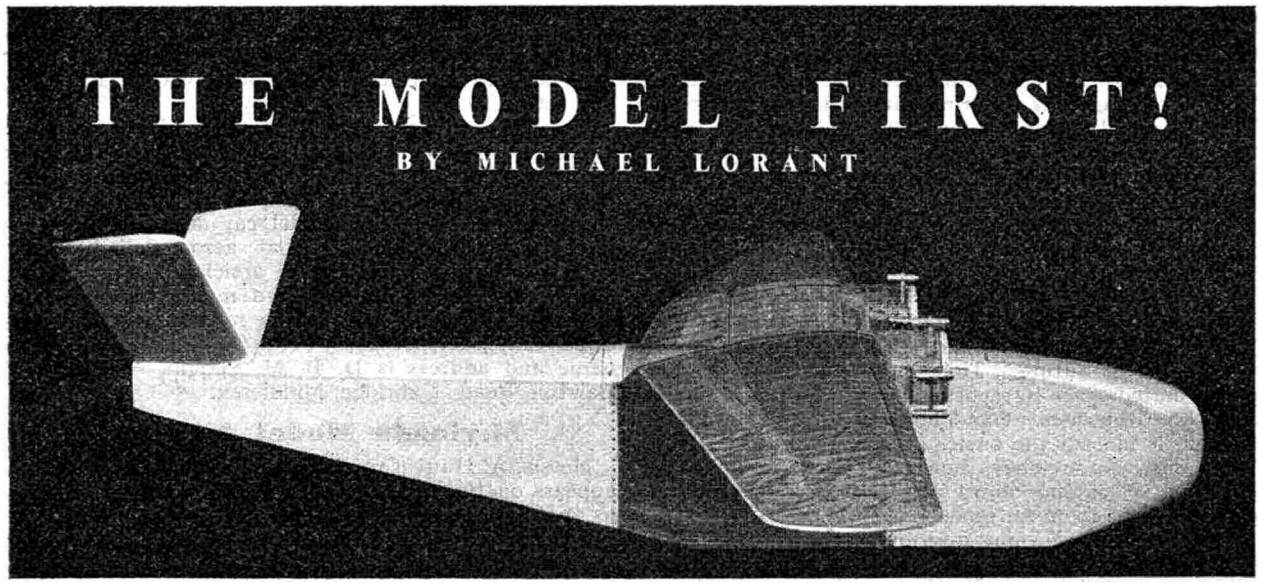
With the end in view of creating a united front and at the same time of offering our help to all, the Association of British Aeromodellers invites all aeromodelling clubs, federations, air scout troops and the aeromodelling sections of the A.T.C., A.C.F., S.C.C. or Youth Movements to become affiliated. Full details of affiliation will be supplied to the secretary of any such club or section upon application.

Negotiations are at present taking place with the Headquarters of the national organisations referred to, which will, we hope, result in the closest co-operation between them and the A.B.A. The leaders of these national organisations are keenly aware of the value of aeromodelling and are anxious that the rising generation shall be encouraged to take a lively interest in it.

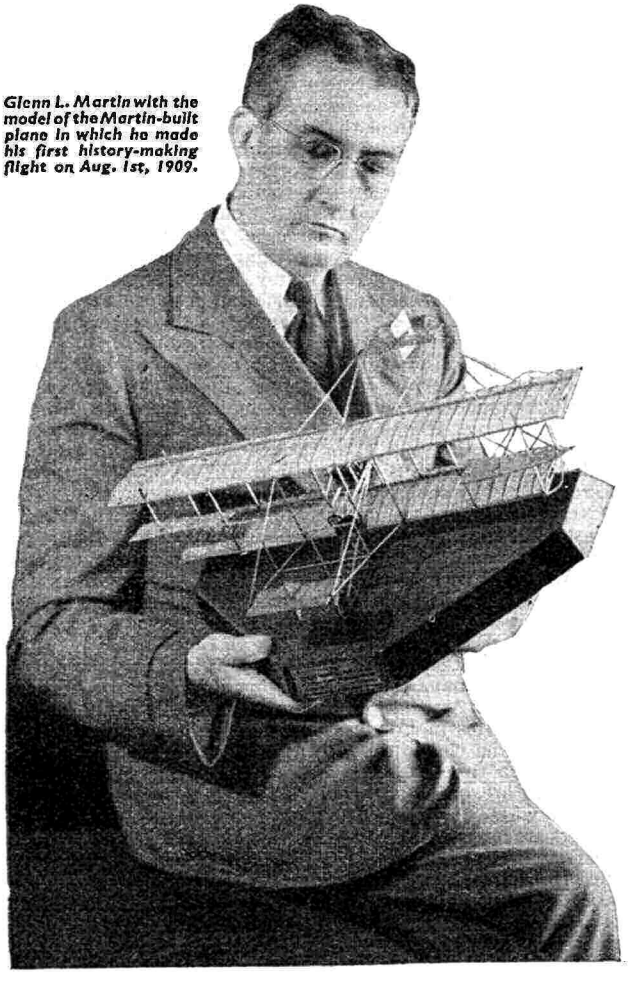
The London County Council Men's Institutes, several of which already have an aeromodelling section, have become affiliated to the Association. As soon as possible all the eleven Men's Institutes in London hope to have an aeromodelling section run on club lines with a qualified instructor to give tuition each time the club meets. The principals of these Institutes are quite prepared to start a club anywhere in London where there is a demand for one, and if any London readers are interested in this development they should contact the Secretary of the A.B.A., who will put them in touch with the principal nearest their homes. A few instructors are still required to complete the panel: any London aeromodeller over the age of 21 who would like further information about these posts, for which a salary is paid, will be welcomed.

THE MODEL FIRST!

BY MICHAEL LORANT



With wings covered with pyralin, a transparent cellophane-like material, this model was built to test the wing flutter characteristics of the PBM-1. This material duplicated in the model the properties of the metal stressed-skin of the full-sized aircraft. Being transparent, deflections of all parts of the structure could be studied.



Glenn L. Martin with the model of the Martin-built plane in which he made his first history-making flight on Aug. 1st, 1909.

MODEL 'plane building—with a purpose—is one of the important functions of the engineering and experimental department of the famous American Glenn L. Martin's aviation company. From blueprints and plans, woodworkers transfer the ideas for new 'planes into small scale models, so engineers can test various principles of aerodynamics.

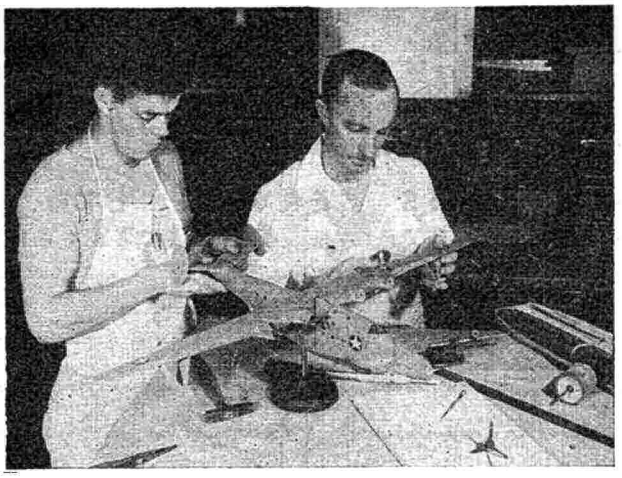
For the world's greatest 'plane, the "Mars," several different types of models were built; one to test the resistance of water on her hull; one, built exactly to scale, to test its stability; one to test the wind resistance on tail and wing surfaces and their vibrations; one a quarter-scale mock-up and one a full-scale mock-up made of wood to show how and where to place fittings, etc.; some study models of different parts of the "Mars" to enable engineers to better visualize their drawings; and several display models.

Up in the Glenn L. Martin's vibrations department of engineering, men are responsible for laying out, supervising and analysing "flutter" tests. They are primarily interested in the wing and tail surfaces, and design models to test these two major parts. Models were formerly built of balsa wood by the experimental department, but models of newly-designed aircraft are being made of paper-thin magnesium sheeting, cemented together by the new cycle welding process.

These model parts must simulate the full-scale 'plane in weight, rigidity, shape and over-all strength—a requisite that demands the finest craftsmanship. Flutter is recorded in wind tunnels by Martin electronic equipment, and the results are co-related to theory.

Wind tunnel models also demand great skill in construction. Most of them are made of laminated mahogany, and the wood must be quarter sawed and the edge grain tilted so as to make the smoothest surface possible. Dust or other articles in the wind tunnel air would disturb the airflow over the tiny 'plane to a magnified degree and spoil the results of the test if the surfaces were not smooth.

Usually the wind tunnel models are solid, some have tiny motors, all are scaled to size and have operable control surfaces. Tests in the tunnel at M.I.T. show the lift, drag, thrust, side force, stability (yaw, pitch and roll) and the pressure distribution of surfaces so that



Two workmen put finishing touches to a display model of the "Mars" in the experimental department of the Martin Company. Here craftsmen build all types of model planes from tiny display types to the full-scale mock-ups. The model above is built in sections to demonstrate full-scale methods of assembly.

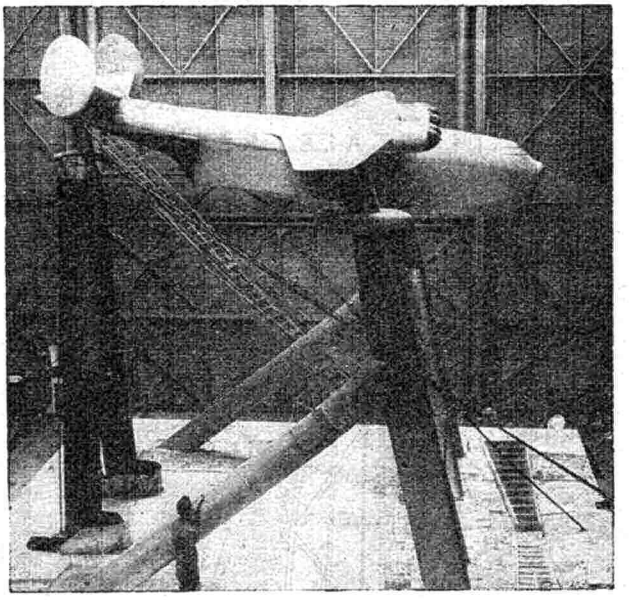
aerodynamic loads may be determined. Models are stationary in the tunnel, but almost any flight attitude may be duplicated during testing.

Another phase of model work is for hydrodynamic testing. These models of white pine, balsa and plywood formerly were made by Martin woodworkers, but are now constructed by various other institutes depending on where the tests are being conducted.

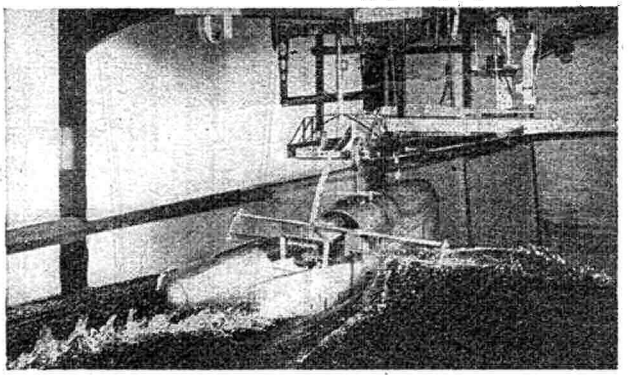
Most of the hydrodynamic models are just copies of the hulls of seaplanes to test the water performance characteristics, but the JRM replica was made complete and with power.

Even before Glenn L. Martin built his first 'plane in 1909, he experimented with models, and William K. Ebel, vice-president in charge of the engineering department, also began his aviation career by building tiny 'planes.

All through the history of the great Martin Company, new designs have first been tried out through the medium of models.

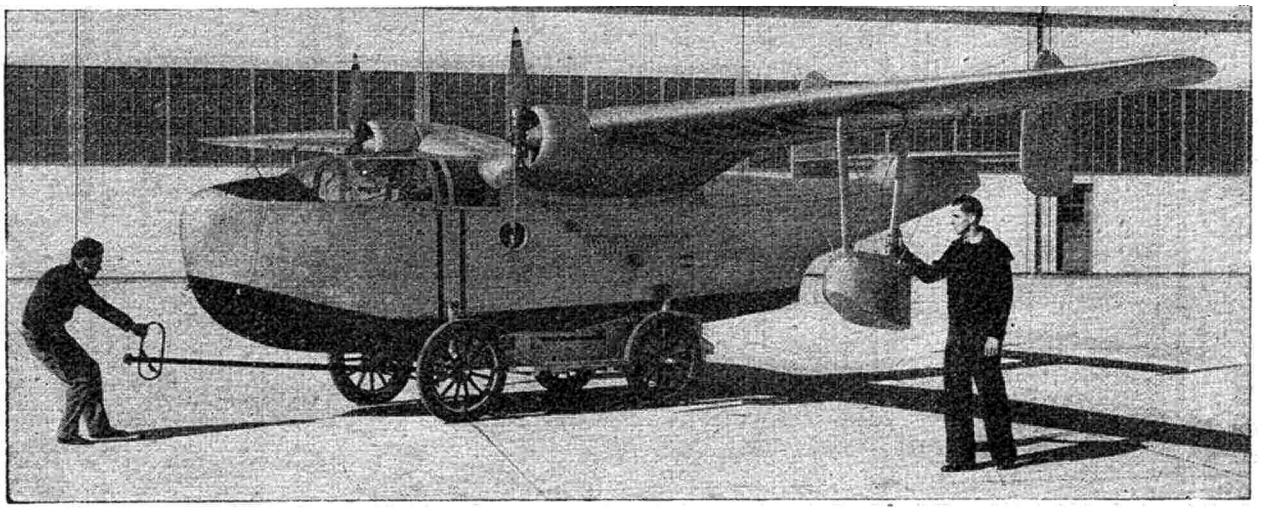


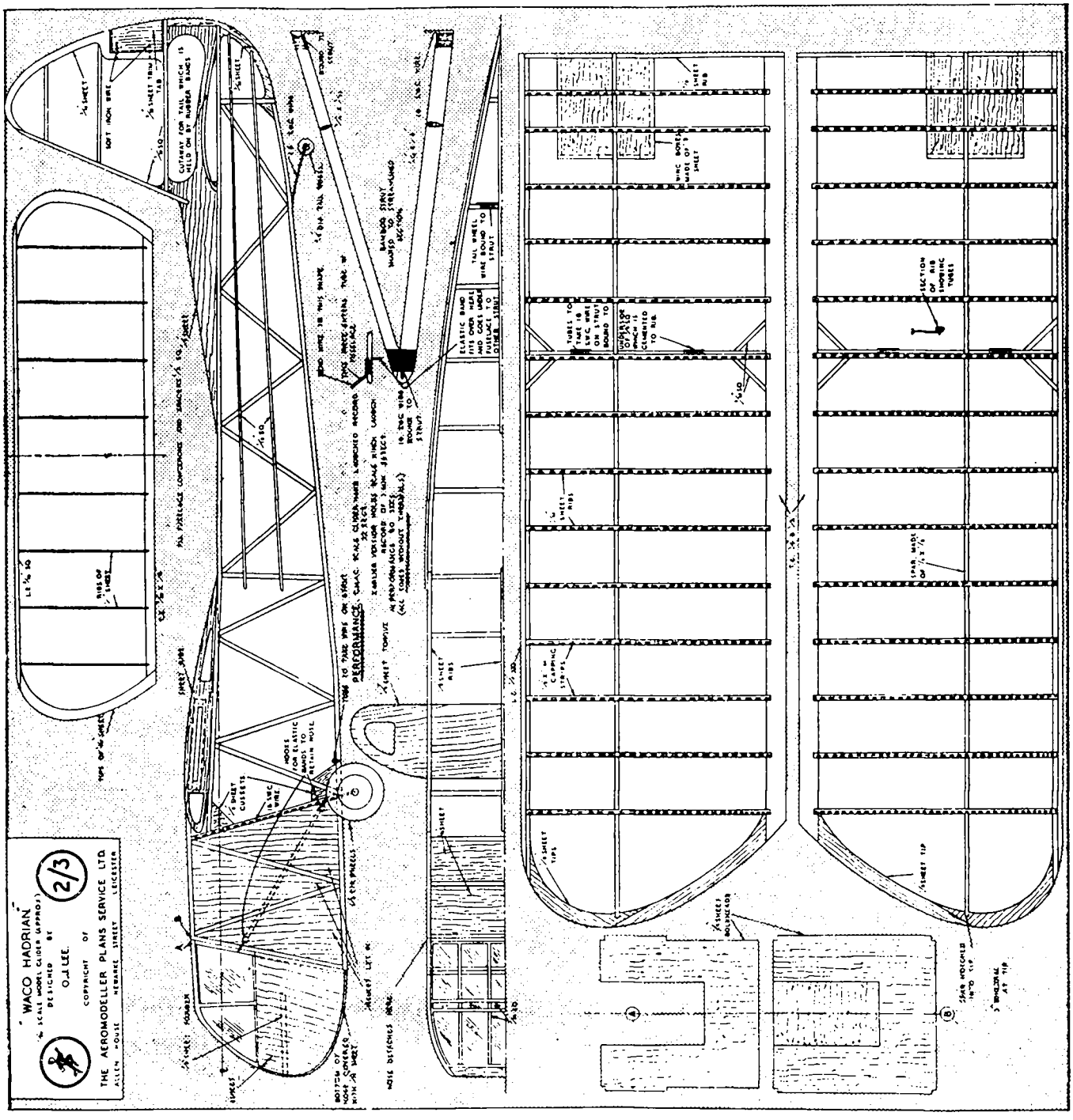
Largest wind tunnel model ever built by the Glenn L. Martin Company was this one-fifth scale replica of the "Mars." It has a wingspread of 40 feet. Note the size of the man in the lower left of the picture. The "Mars" was tested in the wind tunnel at Langley Field, Virginia.

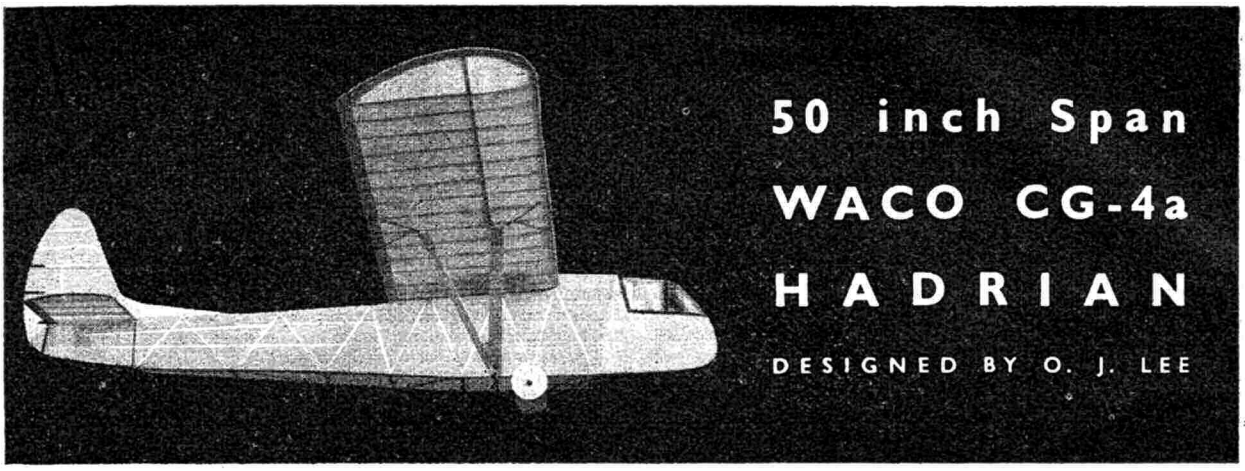


A model of the "Mars" hull (made of white pine) on test in the towing base at the Stevens Institute of Technology, in New Jersey. The strips of wood where the wings would normally be are dummy flaps used to measure the height of the spray at the take-off. If the spray had been too high, a redesigned hull would have been necessary.

Outsize in flying-scale models! This famous model of the PBM-1 was the first in the world to carry a man and was built to test the performance of a then radically new type of flying boat. With a crew of two it was smaller than a Piper Cub and had only a single engine fitted in the hull, with a belt drive to the twin airscrews.







50 inch Span WACO CG-4a HADRIAN

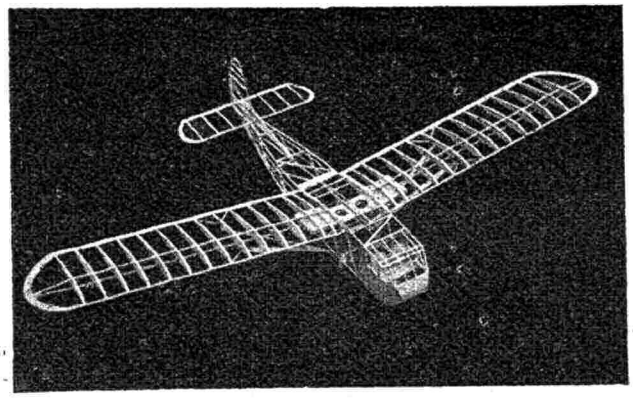
DESIGNED BY O. J. LEE

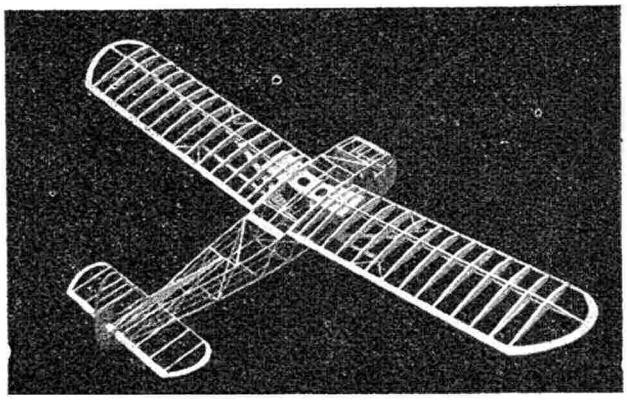
THIS latest addition to the AEROMODELLER Plans Service range is a scale model of the aircraft that, in July, 1943, made aviation history when a Royal Air Force "Hadrian," fully loaded with supplies for Soviet Russia, was towed across the North Atlantic behind a British "Dakota" transport.

With a span of 83 ft. 3 in. the "Hadrian" is only slightly smaller than its British counterpart, the Airspeed "Horsa," and although its capacity is considerably less, it makes up for this by its ease of construction. This very same ease of construction of the full-size machine is duplicated in the model, the main construction of which is to scale. Although the "Hadrian" was designed for mass production, as indicated by the square cut lines of the wing and fuselage, the model is far from unpleasing to the eye, as the accompanying photographs show (note the photograph at bottom right—the designer with a twice-size version of the same model. This may be of interest to those who prefer the increased efficiency of large models.)

The model can be satisfactorily flown from either a hand or a winch launch, and the original model holds both the Scale Hand Launch and Scale Winch Launch records of the Grantham M.A.C. A consistent performer, the model has averaged 80 secs. in a district where thermals appear to be non-existent. The original model was built entirely of South African white wood, which gave a total weight of 12¼ ozs. It was camouflaged in the standard transport glider colour scheme of dark earth and dark green on the upper surfaces and night black underneath.

Ease of construction coupled with efficiency and good looks when completed, will make this model popular amongst both flying scale fans and glider devotees.





JET PROPULSION

BY G · W · W · HARRIS

ITS POSSIBLE APPLICATION TO MODEL AIRCRAFT AND A BRIEF DESCRIPTION OF AN UNSUCCESSFUL ATTEMPT

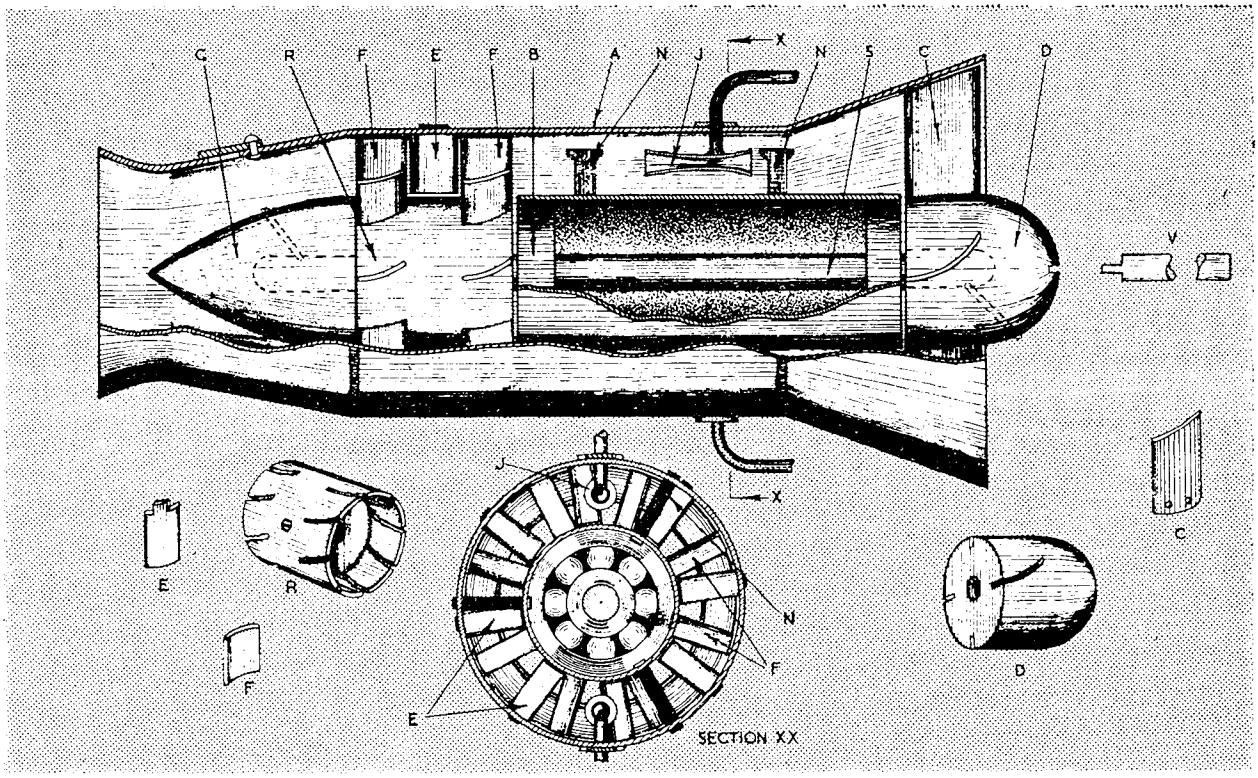
Many readers will no doubt wonder as to why we should publish details of an unsuccessful attempt at a J.P. Unit. The answer is, of course, that we all learn from our mistakes and failures. In fact Mr. Harris has learned to the extent that a further unit he has built successfully functions for periods up to 20 secs. Ill health on the author's part has unfortunately prevented him from continuing his experiments and he has therefore passed on this information of one of his early units so that others may carry on with the good work. Next month we shall be publishing fuller details of this original unit with a description of the actual attempt at running it that resulted in its destruction. We hope eventually to publish full details of a successful unit, and look forward to the day when we can photograph a jet propelled model aircraft in flight!

I FIRST became interested in jet-propelled 'planes about two years ago. I am not at liberty to state here how or why. Slowly but surely I got the urge to build a model jet unit, although it was the opinion of several experts that such a proposition was impracticable. The one redeeming feature, however, was that they did admit "it might be possible to make a miniature unit function very *inefficiently*!"

Now, I have had experience before of experts on "big stuff" saying "it can't be done," and then finding out afterwards it jolly well can. (However, that's a story I'll save for another time.) So with the words "it *might* be possible" ringing in my ears, I went away deep in thought, and after considering on and off for some months, I was certain of one thing; that should a model thermal jet unit be made to function, it *would* be inefficient, but, like its bigger counterparts, it would be subject to improvement, even if limited. So far I have built four such units, one of which is described here. Owing to pressure of matters of more immediate importance, my experiments are now shelved until such time as I can "have another go." In the meantime, I would urge all amateur experimenters to delve into this interesting subject, for even if you fail to reach success, you will have at least gained valuable knowledge because you will inevitably dabble in the problems of air compressors and gas turbines, also the study of fuels and metallurgy.

In the hope of interesting readers, I have made a sketch of my unit Mk. II. As you will see, the various parts are numbered for easy reference; the key to these numbers is given separately. This unit was intended (prior to its destruction by fire) to test out two schemes of fuel injection. The first was to use a pressure injector. Here the fuel was forced by air pressure into the combustion space *via* two jets. The second and more promising scheme was to use two jets shrouded by venturis, the fuel being supplied this time by gravity, *via* a float control valve, made from a motor cycle carburettor.

This drawing is ¾ size of actual unit.



To date, I have tried three fuels—paraffin, petrol, and heavy tractor fuel.

To start this unit up, a small electric motor was connected to the compressor spindle, and the compressor and turbine were thus "run up" to the maximum possible speed, the fuel turned on, when it was simultaneously ignited through a small hole equipped with a "throw-over" cover plate.

If you should decide, in view of the difficulty of designing and making a turbine, to drive the compressor with an internal combustion engine, I would advise for a start, that you keep it isolated from the jet unit so that you can concentrate on the unit itself.

When you consider you have made sufficient headway, then will be the time to see how your "J.Ps." efficiency can be improved by using the waste heat from the internal combustion engine.

In the accompanying sketches you will see what I consider to be the most suitable types of 'plane for jet propulsion. Both types are fitted with tricycle undercarriages.

Key to Drawing.

S—5/16 in. dia. silver steel shaft.

B—Self-aligning ball races.

W—Bearing housing. Mild steel.

N—Bearing housing supports and flow straighteners combined, mild steel.

A—Combustion space casing, to which the compressor air duct and the discharge outlet nozzle are attached. All mild steel.

C and D—Form the compressor. This should have been a light alloy casting, but since it was purely an experiment, it was made up from steel. The blades were fitted into the slots, then a burr punched into each hole and finally sweated. Note the grub screw.

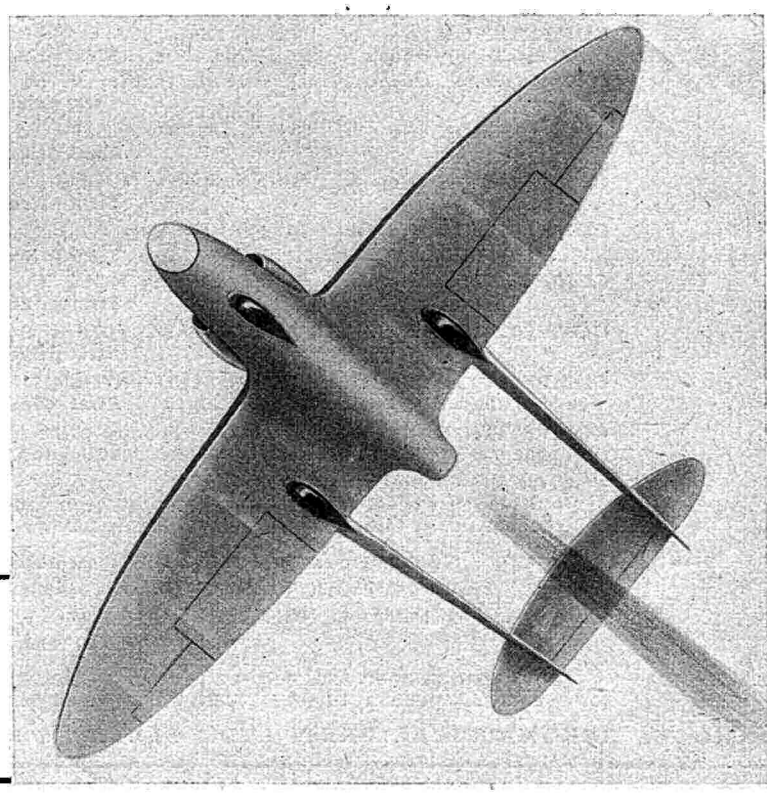
F and R—Form the two-stage turbine. The hub R is turned up from mild steel, the edges are flanged and slotted to simplify fitting the blades F which are brazed in position. The hub is fixed to the spindle by a grub screw.

G—This is the outlet cone or streamlining spinner, it was intended that various shapes for this section of the unit should be tried, because the cross-sectional area of the discharge nozzle has an important bearing on the results of jet units.

E—Fixed blades fitted in slots in casing A and riveted.

J—Venturi controlled injectors.

V—3/16 in. dia. steel coupling shaft; for starting purposes it is connected to an electric motor and engaged by the flattened end to the slot in D.



New problems in design, apart from that of the actual unit, arise with this form of propulsion. As the unit forms the bulk of the weight the C.G. must necessarily fall near it. This can be overcome by designs such as those illustrated on this page. The top sketch shows a tail-first machine with twin intakes and the unit at the rear. The lower sketch shows a twin-boom model with a tail unit in a higher plane than that of the fuselage so as to avoid the jet.

BRITAIN'S FIRST NATIONAL MODEL AIRCRAFT EXHIBITION

ORGANISED BY THE "AEROMODELLER"

OPEN DAILY FROM FRIDAY, JANUARY 5th UNTIL SATURDAY, JANUARY 13th, 1945, (SUNDAY, JANUARY 7th EXCEPTED) AT THE DORLAND HALL, LOWER REGENT STREET, PICCADILLY CIRCUS, LONDON, S.W.1.

This Exhibition, Aeromodelling's greatest "show" since the outbreak of war, will be open daily from 11 a.m. until 9 p.m. Admission is 1/- and for juniors and members of the Services in uniform 6d

Every type of model aircraft will be displayed including a number of well-known Competition winning machines and examples of unusual and experimental models. There will be for instance, an outstanding electrically-driven R.T.P. Miles Magister. This will be demonstrated in flight throughout the Exhibition. Another special feature is the Cinema in which will be shown films of model aircraft. Experts will be in constant attendance at the Advisory Bureau. Here they will help you with your problems and answer your queries.

Last, but by no means least of the special features, are the Competitions run in conjunction with the Exhibition, particulars of which are given below. There are no entrance fees for any of these Competitions. Entries must be made on the official Competition entry form obtainable from the Aeromodeller Offices on receipt of a stamped and self-addressed envelope. All models must be securely packed and despatched to the "Aeromodeller Receiving Centre," c/o, Aircraft (Technical) Publications Ltd., 7, Hanover Court, London, W.1.

Models will be insured whilst on display and during their transit to and from the Exhibition, but no responsibility will be accepted by the organisers for possible damage due to enemy action.

COMPETITIONS

COMPETITION No. 1. NON-FLYING SCALE MODELS.
Class A for models up to 1/72nd scale. **First prize, £5. Second prize, £3. Third prize, £1.**
Class B for models of any scale larger than 1/72nd scale.
First prize, £5. Second prize, £3. Third prize, £1.

COMPETITION No. 2. DURATION MODELS OF ANY TYPE.
First prize, £5. Second prize, £3. Third prize, £1.

COMPETITION No. 3. FLYING SCALE MODELS. Any Scale.
First prize, £5. Second prize, £3. Third prize, £1.

COMPETITION No. 4. SAILPLANES AND GLIDERS.
First prize, £5. Second prize, £3. Third prize, £1.

COMPETITION No. 5. PETROL-DRIVEN MODELS.
First prize, £5. Second prize, £3. Third prize, £1.

COMPETITION No. 6. SEAPLANES AND FLYINGBOATS. Petrol-driven or Rubber-driven.
First prize, £5. Second prize, £3. Third prize, £1.

COMPETITION No. 7. GENERAL AND EXPERIMENTAL, i.e. ANY type of model not eligible for any of the above Competitions. **First prize, £5. Second prize, £3. Third prize, £1.**

COMPETITION No. 8. Class A. Special prize of 10 Gns.
To the member of a Model Aeroplane Club submitting the best model aircraft irrespective of type.

Class B. Special prize of 10 Gns.
To the member of either the Air Training Corps, Army Cadet Force, Sea Cadets, Boy Scouts, Spotters Club or any similar recognised body, submitting the best model aircraft irrespective of type.

The undermentioned have kindly consented to form the panel of Judges:
AIR COMMODORE SIR J. ADRIAN CHAMIER, C.B., C.M.G., D.S.O., O.B.E.
AIR COMMODORE A. W. GLENNY, M.C., D.F.C. D. A. RUSSELL M.I.Mech.E.
C. A. RIPPON, Chairman of the A.B.A.

Send 2½d. stamped and self-addressed envelope to the address below for official entry form and Competition rules. Mark your envelope "Competitions" in top left-hand corner.

MODEL AERONAUTICAL PRESS LTD., ALLEN HOUSE, NEWARKE ST., LEICESTER.

1/20th Scale HAWKER TYPHOON IB

BY G · R · WOOLLETT

A FEW weeks before the S.M.A.E. notice appeared announcing that the first National Solid Model Contest was to be staged in the winter of 1943 I had completed the plans for a 1/20th scale Typhoon IB. At that time information had been released and numerous photographs and drawings were published, which was very convenient for the start of my winter activities. It has been my practice to build a couple of solids during the winter months and in the summer to devote my energies — considerably reduced by then — to flying models and gliders.

I therefore decided to enter the Typhoon for the first half of the Contest, which left me three months in which to complete it. The scale to which I model provides plenty of scope for detail and the Typhoon aircraft has many interesting features not present in other liquid-cooled, single-engine aircraft, except perhaps the Barracuda. The following list was drawn up to include all the items which could be made to operate on the model:

1. Retractable u/c and tailwheel (the latter also to swivel).
2. Workable radiator flap and fully detailed radiator.
3. Cockpit hood and door hinged—side windows to slide.
4. Cockpit interior detailed as far as practicable.
5. Retractable stirrup footstep.

With these problems before me I set to work on September 25th.

Fuselage.

The fuselage was constructed first and is built upon the backbone system in two halves. After attaching the half-formers to the backbone strips the structure was planked with 3/32 in. hardwood strips, approximately ¼ in. wide, glued with Durofix. The half monocoque was then removed, the stirrup footstep assembly fitted and the other side completed.

Radiator.

The radiator shell was next fashioned from hard balsa and the interior removed. Next the inside walls were treated with grainfiller and sanded smooth, after which the radiator shell was split laterally at a point where the front radiator gauze is positioned. This gauze has the centre cut away to allow the carburetter intake to be sweated in place.

The intake is simply a tube of tin, butt-jointed and soldered. Surrounding the intake is the oil cooler bounded by a concentric frustrum of a cone formed of tin and sweated to the gauze. The four radial baffles and vertical bars were then added, the latter simply consisting of 22-gauge wire.

A rectangular piece of gauze was fitted at the rear of the shell and then the two parts were cemented together. The radiator flap was then fitted to complete the assembly.

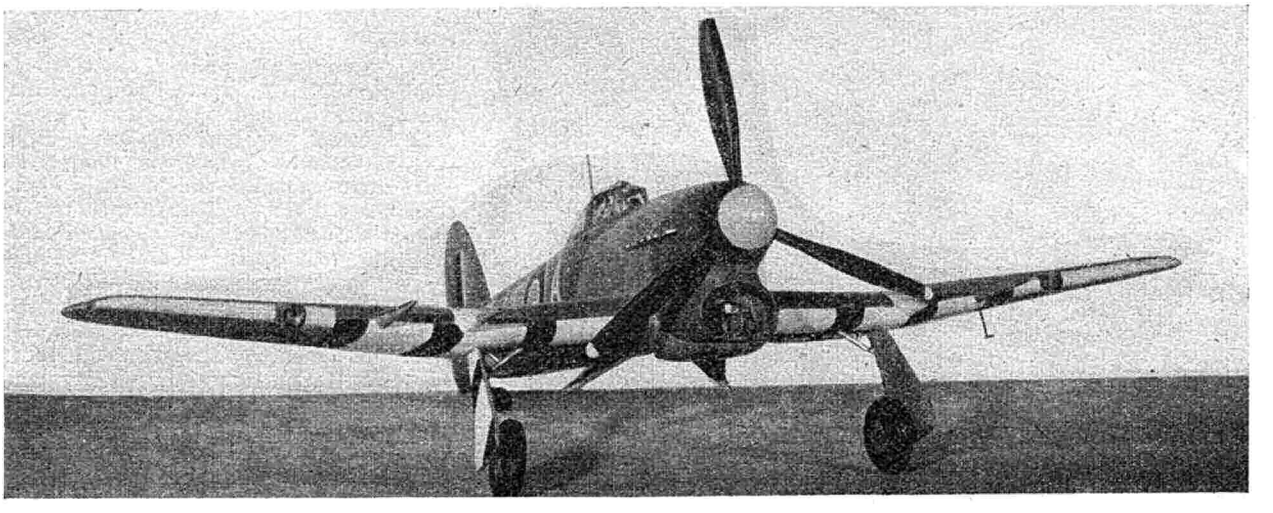
Cockpit.

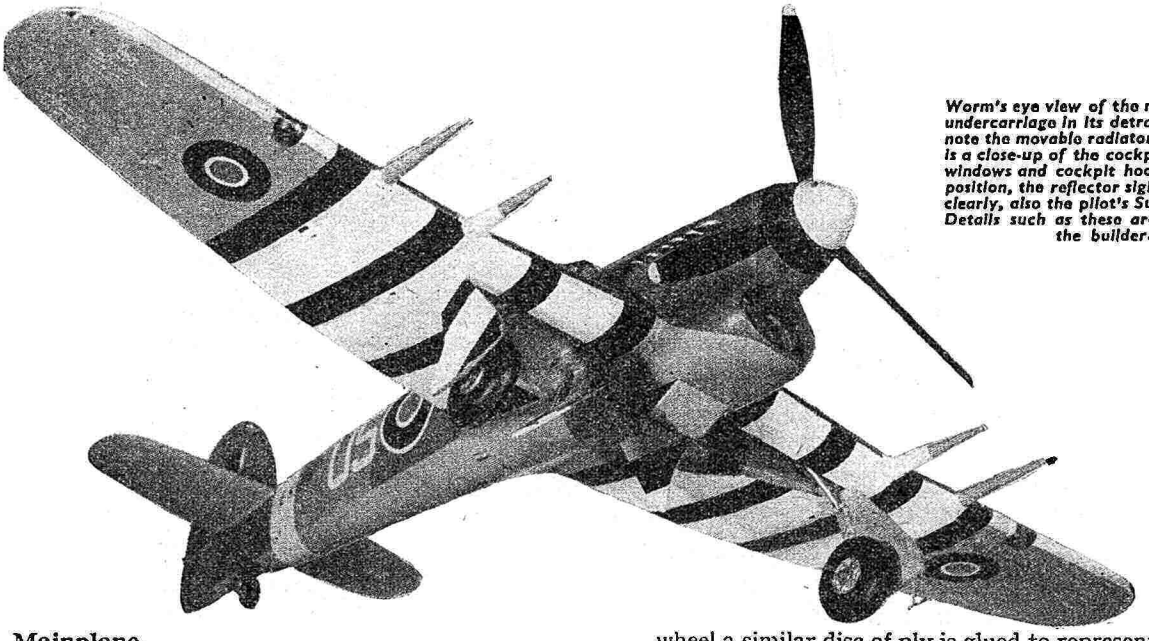
Probably the most difficult parts of the whole model to fit and operate correctly were the cockpit door and hinged hood. Fortunately, however, I hit on the idea of forming the side window frames from brass tubing filed to a channel section and bent to form an inverted U. After cutting out both sides of the fuselage for the doors and building them up sufficiently to permit the fitting of cellastoid windows and a door catch, the brass tubes were attached as shown. This made a very satisfactory job. The accompanying sketch shows the method of pivoting the door to get the correct attitude necessary owing to the fuselage curvature. Over the door catch (starboard) is a hinged flap made of sheet copper which can be opened to give access to the release.

The hood frame is made of 1/32 in. ply and a moulded cover of celluloid was glued in position after the cockpit framework had been aligned and the securing catches fitted.

Having satisfactorily overcome that problem, the completed hood, supports and doors were set aside while the mainplanes were built.

This front view of the model shews many of the excellent details incorporated, such as the radiator, undercarriage fittings, and the landing lights.
Space does not allow us to publish 1/20th scale plans, any readers wishing to build the Typhoon are referred to the July 1943 "Aeromodeller" in which 1/72nd scale plans were given. These can quite easily be scaled up.





Worm's eye view of the model with the undercarriage in its detracted position; note the movable radiator flap. Below is a close-up of the cockpit with doors, windows and cockpit hood in the open position, the reflector sight can be seen clearly, also the pilot's Sutton Harness. Details such as these are a tribute to the builder.

Mainplane.

This is in the usual three sections and the framework is planked with 1/16 in. strips varying in width, a space being left for the u/c wheel wells. The wing tips are made from balsa sanded to shape. The photographs show the characteristic wing tip of Hawker monoplanes—having a flat undersurface with the top sheeting sloping down sharply from the last rib to meet it.

Undercarriage.

The u/c was next built and fitted, checked and then set aside until the model was ready for assembly.

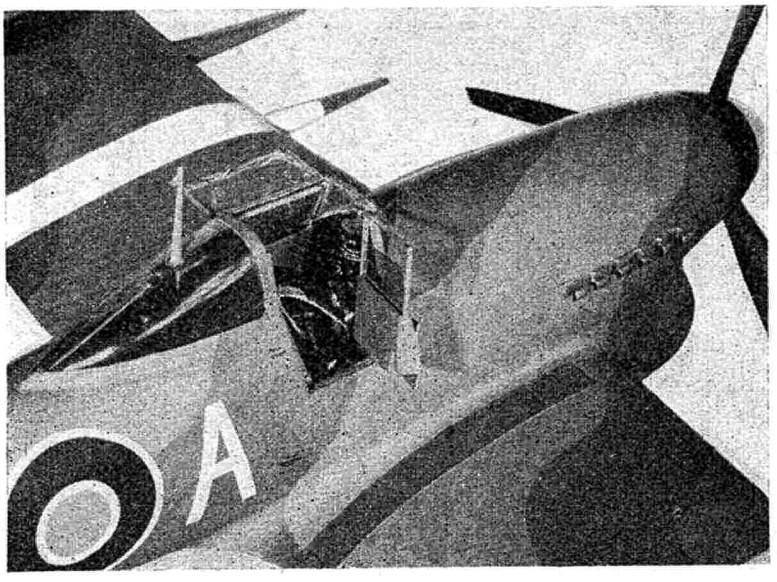
The wheels are built from $\frac{1}{8}$ in. hardwood laminations glued together with casein. The method adopted was to cut out the required number of discs, drill their centres and then glue the whole assembly correctly aligned with a piece of suitable size brass bush. When dry the bush can be removed, the disc sanded to correct shape and a recess cut away for the 1/32 in. ply centre portion fretted out to form the spokes. On the other side of the wheel a similar disc of ply is glued to represent the brake drum. After liberally coating the centre hole with glue the bush is pushed home and allowed to set. To complete the wheel a small portion of a pin is pushed into the wheel between two spokes to represent the inflating connection.

A very simple down lock was formed by the retracting strut, the upper end of which is bent to run in a slot in the front spar web. At the extreme lower end of the travel the slot turns through 90 degrees, into which the retracting strut slides to lock the u/c down. The fit of the oleo leg and wheel fairings in the centre-section retains the u/c in the up position.

The tailwheel was made to retract and swivel as shown, the down lock being formed by a suitably shaped spring retainer at the bottom of the rear fuselage.

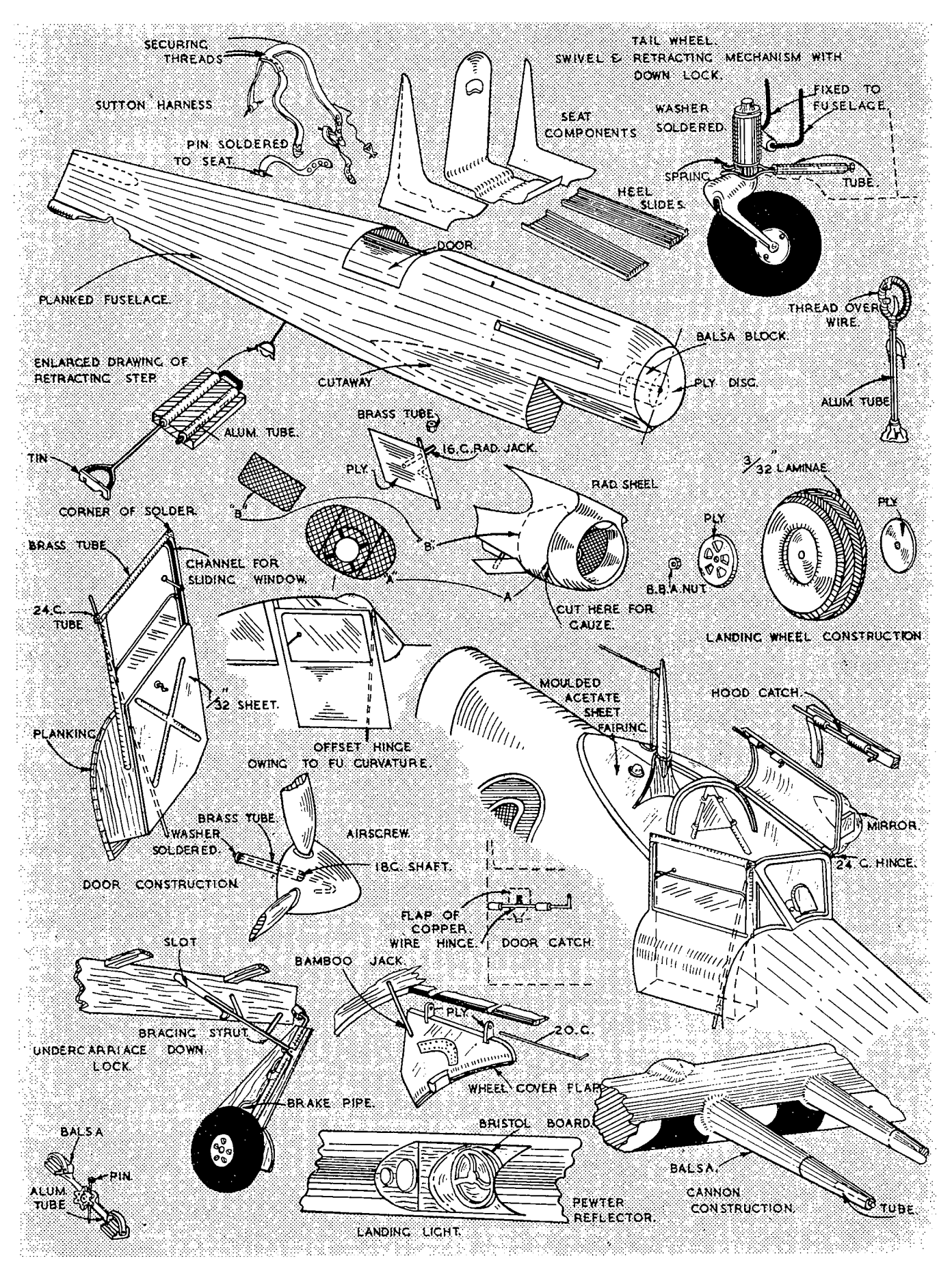
Tail Unit.

The tailplane, elevators, rudder and fin were next completed. To simulate the fabric covering of the rudder thin strips of paper doped in the correct rib positions were used—a method which is quite well known and one to be strongly advocated.



Airscrew.

The spinner was built of balsa laminations on a 1/32 in. ply backplate with a 16-gauge shaft inserted and aligned. The shaping was done by hand, using sandpaper and a cardboard template. To accurately assemble the blades a circle equivalent to the diameter of the airscrew is first scribed on to a flat piece of board. The three blade centre lines are next drawn in at 120 degrees and the centre drilled to take the A/S shaft. After the spinner has been drilled it is positioned over the hole in the board, the blade roots coated with cement and fitted. An angle template under each blade ensures the correct angle, and strips of paper held by drawing pins secure each blade until the cement has set.


SECURING THREADS
SUTTON HARNESS
PIN SOLDERED TO SEAT
SEAT COMPONENTS
TAIL WHEEL SWIVEL & RETRACTING MECHANISM WITH DOWN LOCK.
WASHER SOLDERED
FIXED TO FUSELAGE.
SPRING
TUBE.
HEEL SLIDES.
DOOR
PLANKED FUSELAGE.
THREAD OVER WIRE.
BALSA BLOCK.
PLY DISC.
ALUM. TUBE
ENLARGED DRAWING OF RETRACTING STEP
CUTAWAY
ALUM. TUBE.
TIN
BRASS TUBE
16 G. RAD. JACK.
PLY
RAD. SHEEL
3/32" LAMINAE.
PLY
PLY
B.B.A. NUT
CORNER OF SOLDER.
B
B'
A'
A
CUT HERE FOR CAUZE.
LANDING WHEEL CONSTRUCTION
BRASS TUBE
CHANNEL FOR SLIDING WINDOW.
24 G. TUBE
1/32" SHEET.
PLANKING
OFFSET HINGE OWING TO FU CURVATURE.
MOULDED ACETATE SHEET FAIRING.
HOOD CATCH.
BRASS TUBE
WASHER SOLDERED
AIRSCREW.
18 G. SHAFT.
MIRROR.
24 G. HINGE.
DOOR CONSTRUCTION.
FLAP OF COPPER WIRE HINGE.
DOOR CATCH.
SLOT
BAMBOO JACK.
PLY
20 G.
BRACING STRUT.
UNDERCARRIAGE DOWN LOCK.
WHEEL COVER FLAP
BRAKE PIPE.
BRISTOL BOARD
BALSA
PIN
ALUM. TUBE
PEWTER REFLECTOR.
BALSA.
CANNON CONSTRUCTION.
TUBE.
LANDING LIGHT.

Grainfilling.

I have no special methods of obtaining a finish on my models. I have been quite satisfied with the commercial brands of grainfiller obtainable, and the method used was to allow the first coat to harden properly and sand smooth with No. 0 sandpaper. The successive coats as necessary are finished with No. 00 grade and then the components are individually completed before final assembly. The great thing is, first, let the stuff harden properly, and secondly, take great pains over the sanding. After grainfilling the fuselage the cockpit details were added.

Cockpit Interior Details.

Many of the fittings are made from thin Bristol board, which has a fine surface and is extremely useful for making instrument panels. This is made in the following way. Two pieces of Bristol board are cut to the correct outline and doped matt black. One of these has holes perforated for the various instruments and the other is picked out in white ink to represent the dial figures. Sandwiched between the two cards is a thin sheet of cellophane. The oil gauges are then outlined with yellow dope, coolant temperature gauge blue and boost gauge red. Other details, switches, etc., are then added.

The tubes on which the cockpit structure is built, including the crash pylon, are represented by aluminium tubes plugged with balsa and cemented in the appropriate positions.

The throttle box is of card and the levers are satisfactorily represented by pins.

Odd pieces of balsa, cellastoid and card constitute the compass, reflector sight, map case and tail trimming wheels.

The control column consists of a length of tube into the top of which is plugged a balsa insert housing the spade grip of wire bound with thread. The gun firing button of brass is glued in place and the handbrake of card fitted to complete the "stick".

A rudder bar is fixed to the floor beneath the panel and heel slides fitted made from strips of pewter scored with a blunt scriber to represent the corrugations.

The seat is made from three pieces of tin sweated together, and a Sutton harness made from coarse fabric with brass eyelets of fine gauge tubing cut off in 1/64 in. lengths completes the interior details. A coat of cockpit green was then applied to the interior.

Assembly.

The three sections of the wing were next glued together and the u/c units finished and assembled. Details such as landing and navigation lamps next received attention. Pieces of red and green celluloid were moulded for the latter and moulded acetate sheet covers were cemented to the wing tips.

The cannon and pitot head were not fitted at this point.

Fuselage and wing were then aligned, glued and braced in position, after which the radiator and fairings were added. Then followed the tail unit. The complete cockpit hood and assembly was fitted and the door checked for operation. After fitting, the aerial mast bracket, upward identification lamp and rear moulded cockpit fairing were added and all joints covered with thin strips of paper.

Exhaust stacks, cannon, rearward navigation lights, pitot head, etc., were now added and the whole prepared for finishing by the application of filler to all joints and irregularities in the surface.

Finishing.

This, I think, is the most interesting job of all and I endeavour to copy the scheme of the full-size aircraft as faithfully as possible. Incidentally, I use brushes for all my work.

The whole was given an undercoat of grey, which after rubbing down provided a good base for the camouflage. Light pencil lines were used to indicate the coloured areas and two coats of each colour gave an even finish. Roundels are first marked in with a pair of ink compasses filled with diluted coloured dope, then a No. 1 sable brush is used to fill in the area with the correct colour. The result is well worth the trouble, and if matt dopes are used the effect is very realistic.

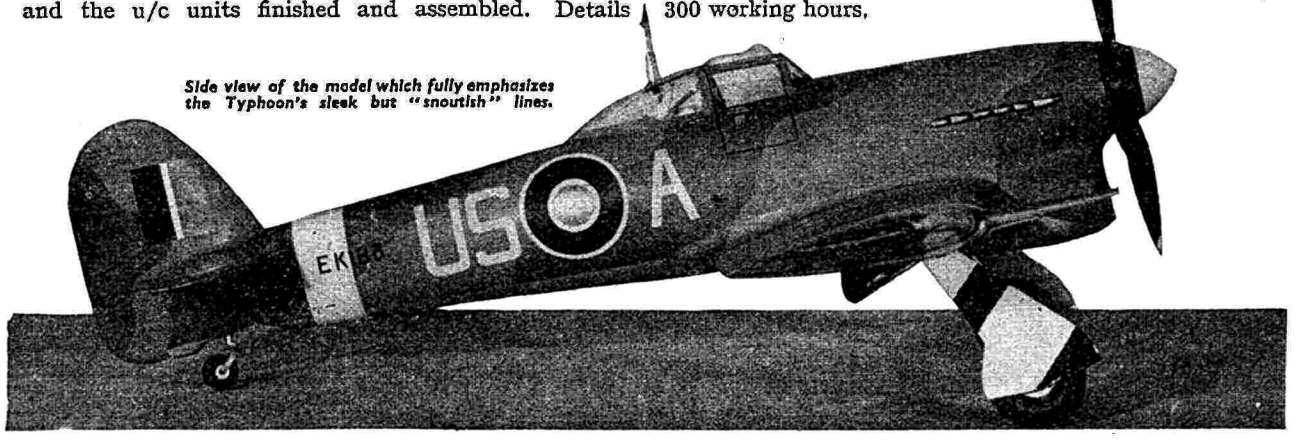
The duck-egg 18 in. band, code letters, etc., were pencil marked and the area filled in, while for the aircraft serial number Indian ink was used with a final light coating of banana oil. Maker's numbers (fictitious), etc., were added in white ink.

Over the airscrew shaft is fitted a brass tube slightly shorter than the shaft. A spot of solder retains it and the tube, coated with glue, is pressed into the balsa block in the nose of the fuselage. This secures the airscrew very effectively and allows it to rotate without wobble.

The main wheels are retained by 8 B.A. nuts sweated to the ends of the axles.

This outline of my methods may be of especial interest to those of you who may be contemplating making a series of the larger models where detail is unlimited.

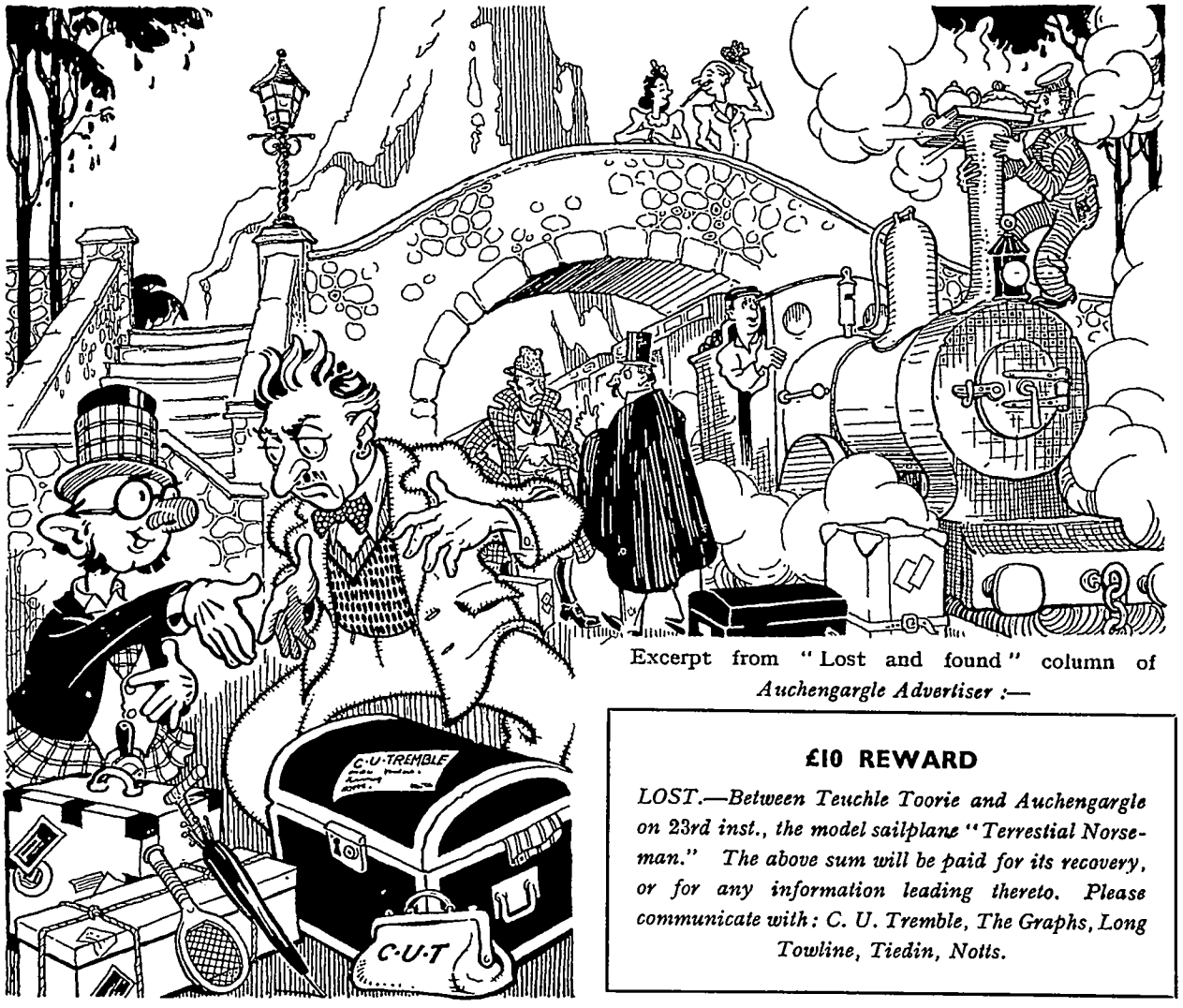
The completed model has taken three months of spare time to build, occupying approximately 300 working hours.



Side view of the model which fully emphasizes the Typhoon's sleek but "snoutish" lines.

SOLO SORTIE

BY ROBERT JAMIESON



Excerpt from "Lost and found" column of *Auchengargle Advertiser* :—

£10 REWARD

LOST.—Between Teuchle Toorie and Auchengargle on 23rd inst., the model sailplane "Terrestial Norseman." The above sum will be paid for its recovery, or for any information leading thereto. Please communicate with: C. U. Tremble, The Graphs, Long Towline, Tiedin, Notts.

MR. TREMBLE had brought the famous glider north when he spent a short holiday at Teuchle Toorie. He had not intended flying it, but, on the very last day of his visit, the combination of a perfect evening and the importunities of the Teuchle Toorie clubmen had proved irresistible. It had soared off like a dream, and the enthusiasts had stood enthralled until it was realised that it showed no signs of returning to earth. Some three hours later a gang of frantic aeromods had to confess themselves beaten, and the owner was almost in tears. And no wonder; for he had to travel south next day, leaving his precious model in the wilds.

When McGillicuddy heard of the disaster he immediately announced an armistice between the glider expert and himself.

"Maybe Tremble and me don't always see eye to eye," he said. "But the lad's a clever craftsman, and in times of trial we aeromods must stick together."

On his own accord he went to the station to see Mr. Tremble depart for the south, and returned to the club looking grave and thoughtful. "A dreadful calamity," he said, sitting down in his favourite chair. "That poor lad's fair demented—and I don't wonder at it."

"Do you know what I did?" he went on, tilting his hat back and rubbing his nose with his finger. "I walked straight up and consoled him. Then I assured him that until his model was recovered all enmity between us would be forgotten, and that the Auchengargle Club would do all in its power to recover the model. The poor lad caught hold of my hand and sobbed like a child."

"Did he now?" said McSwindle with interest. "I'd like to have seen him."

The Maestro quelled him with a glance. "Have you no sympathy for human suffering?" he asked sternly, but the other members stopped the row from developing by insisting on the Maestro drawing up his plan of campaign.

McGillicuddy was insistent that our search for the missing model should be a combined affair, with all members co-operating; and that the reward (when and if we got it) should go to Club funds. Unfortunately the

Teuchle Toorie Club seemed to harbour the same idea, and when we approached them with our request to participate in the search, they were quite rude, even going so far as to suggest that the Maestro had already recovered the model, and was keeping it until the hue and cry had died down and/or the reward was increased.

The Maestro shook his head sadly when the reply was received. "My—but they are a suspicious crowd—it's things like this that start wars," he said. But we had no time for harbouring resentment, or planning a suitable comeback, if the model was to be recovered and the reward gained.

A large scale map of the district was procured; and the strength and direction of the wind on that particular night was ascertained, and the approximate launching point pin-pointed on the map. Drambuie was pressed into service and, bribed with sardines, was sent to reconnoitre. He patrolled from dawn to dusk, returning only to refuel. When the sardines were finished he seemed to consider his duty done, and promptly went off to sleep perched up in the rafters, belching at intervals. Drambuie was an individualist at all times and lacked the co-operative spirit.

About two days later a letter postmarked London arrived at the Club. It was from Mr. Tremble.

"So you old skinflint! You've got itchy fingers, snooping around after the dough? Well, let 'em itch; I'd rather lose the job than have you get it. Guessed that's what you were after when you came smarming round at the station, trying to butter me up. Don't suppose I need worry—fat chance you've got of finding it—with so many intelligent men on the hunt. But I'll stick to my word—whoever finds it gets the cash—but any hanky-panky and I'll skin you alive and use your hide to cover my workbench.

Yours horribly,

C. U. Tremble."

"Aye, aye," said McSwindle, when the letter was read, "so he caught hold of your hand and sobbed like a child."

"We musn't be harsh," answered McGillicuddy. "Poor lad—the grief must have unhinged his mind—or else the Teuchle Toorie mob have got at him."

Despite the fact that Mr. Tremble hardly seemed to welcome our co-operation, the letter had a reassuring effect. A mind so far unhinged by grief as to sob in the arms of his worst enemy might quite well forget about the coveted reward, but now we had his written promise; and there was something reassuring in the thought of "Business as usual" between the Maestro and the bereaved glider expert. The search was resumed with renewed vigour.

We went through the neighbourhood with a fine-toothed comb. We climbed trees, trailed over moor and hill, peered down rabbit holes, turned over boulders and parted blades of grass. All to no avail, and after two days of futile searching our keenness began to wear off and the dark seed of suspicion began to sprout.

Instead of spreading out singly, and covering the ground thoroughly, the searchers began to trail about in a bunch, each one keeping a wary eye on his neighbour. Hitherto the Maestro had been the most energetic of the hunters, but now he too began to display less enthusiasm, and the more cynical openly stated that there might be something in the Teuchle Toorie boys' idea that the old twister already had the model and was just keeping it up his sleeve.

Then, just when the whole affair looked like fizzling out, I found the model, or more correctly, spotted it.

Passing along a cliff edge, on one of the lower shoulders of Ben McSplurge, I happened to look down on a birch wood which was part of a private estate, and there she was, one wing tip just showing through the trees.

The others were called up and binoculars focussed. Yes! There she was, apparently undamaged—but far out of our reach—for the ground where she lay was strictly private—so far as aeromods were concerned. The owner was a very short tempered gentleman, and unfortunately there had been a slight misunderstanding over a broken cucumber frame some months before.

"I think, lads," said the Maestro, in a very thoughtful voice, "that we had better go back to the Club and have a conference."

It was galling to leave the ten pound reward lying where the Teuchle Toorie boys might spot it; but the owner's last words to us had been positively blood-curdling; his Alsatians were both swift and fierce, and his gamekeeper a man without the bowels of compassion, who never seemed to sleep. Our one consolation was that the other club were not aware of our unfortunate little contretemps with the landowner, and if they spotted the model, would probably charge in baldheaded. Well—if their garments were rent they needn't come to us for clothing coupons . . .

Back at the Club McGillicuddy sat twiddling his thumbs, whistling, and staring at the ceiling. At last he said slowly, "I'm thinking, lads, about the time I saw Tremble away——"

"Aye—and he sobbed like a child," McSwindle interrupted rudely. "But that's no helping to get the model."

"Well—so that's what you think?" snorted the Maestro. "What do you propose?"

"It's a dreadful risk," said McSwindle slowly, "and it's no as if the chap gets the reward for himself."

Murmurs of assent from the meeting.

"It's a risk I'm quite willing to take—" said the Maestro, and then he stopped—"but seeing the reward's to go to the Club we'd maybe better draw lots."

After some heated discussion, this was agreed to—and the Maestro was unlucky enough to draw the short straw. His lack of enthusiasm was puzzling, considering that he had volunteered only ten minutes before.

"It's an awful job for an auld man to tackle," he said, "—savage dogs and gamekeepers with shot guns——"

McGillicuddy's fears rather damped the spirit of the meeting, and feelings that had soared with the finding of the model now began to wilt. Returning the "Terrestial Norseman" was going to be a tough proposition.

"And while we're jittering here," said McSwindle, "the Teuchle Toorie boys are likely walking in."

To minimise the danger—or at least to ensure that we should be warned in the event of it happening—Joe Small was despatched with instructions to lie low, keep his eyes on the model, and warn us immediately should the rival club pass that way. He departed with mixed feelings. Obviously relieved to be given such an easy task, but rather aggrieved to be missing the proceedings in the Club.

Silence followed his departure; no one knew what to do next. Obviously the Maestro's move. At last he broke the silence with:

"It's an awful like job for an auld man to tackle——" He broke off and Snooky Munro glared at him.

"I know what's up with you—you're scared—you're yellow——"

The Maestro bridled. "A McGillicuddy never failed in his duty yet," he declared.

" Bet you any money you're scared," Munro persisted.

McGillicuddy shook his head sadly. " I'm no betting —what use is money nowadays, with so little stuff in the shops ? "

" O.K.," said Munro. " No money then ; but I've got two sheets of sixteenth balsa here that says you're yellow—— "

" And I've got two jars of dope and six sheets of tissue—— " broke in McSwindle.

" Come now, lads—you don't have to bribe me to do my duty," the Maestro replied. But he accepted the wagers and covered them suitably. His lack of enthusiasm for the coming expedition spurred the members to further " dares and double dares," and it was soon obvious that if he was successful in recovering the model he would corner most of the material in the Club ; no doubt the predominant thought was that the risk was worth taking when there was every possibility and hope of the Maestro's garments being rent and his flesh bruised. Wagers were still being made when Joe Small dashed in, blown and perspiring.

" The Teuchle Toorie mob have spotted it ! " he gasped," they're going in to-night—soon as it's dark."

The Maestro rose and struck a dramatic attitude : " It's a far, far better thing I do— " he quoted, then— " but it's an awful job for an auld man to tackle."

He insisted on setting out alone, pointing out that stealth and silence would be necessary, and that a crowd would prejudice his chances. " But you can wait for me at Dickman's Dyke," he said, " and help me to carry the 'plane back if I'm still alive."

With that he went off, still looking rather nervous. We gave him an hour's start before setting off for the rendezvous.

By this time it was dark. The clouds were so low that Ben McSplurge had his head in among them. As we walked along everyone speculated on how McGillicuddy would be getting on, and when a dog bayed in the distance, we all jumped.

Arriving at the appointed spot, we hung around for a bit, then, actuated by a common impulse, we began to edge nearer the boundary wall of the estate. The minutes ticked by—and still all was silence. All eyes were strained into the darkness, and ears alert for the slightest sound. When Joe Small broke the tension by sneezing the whole party turned on him in fury.

Silence fell again and more time went by : then suddenly pandemonium broke loose in the wood. The silence was shattered by an angry baying of dogs, the hoarse shouts and cries of men, and the tearing and cracking of branches and undergrowth.

" They've got him, lads, they've got him ! " McSwindle cried in anguish. " Volunteers for a rescue party—— "

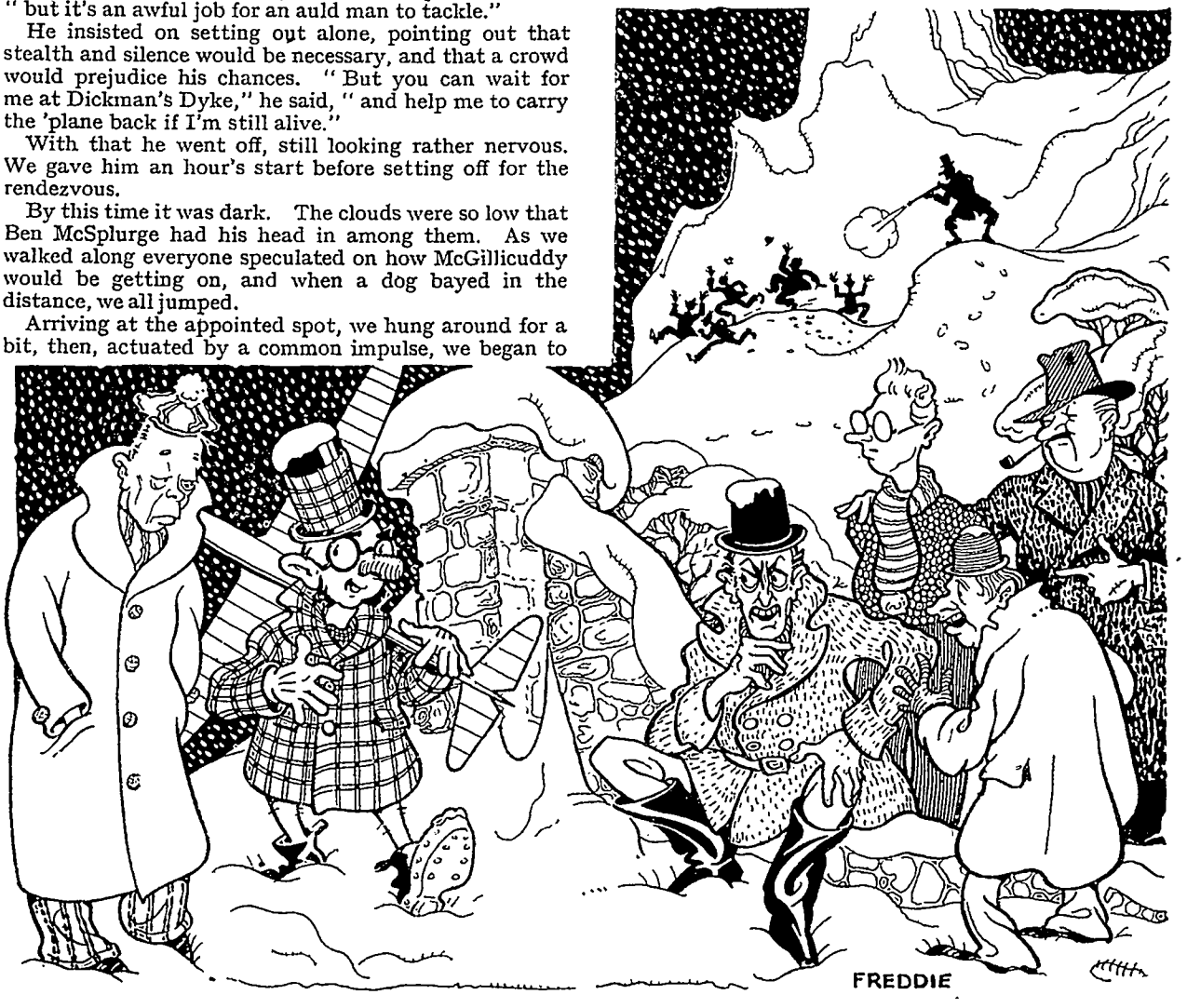
" You needn't bother," a voice broke in at our backs. We whirled round to find the Maestro standing, serene and unperturbed, with the " Terrestial Norseman " slung gracefully over his shoulder

" Come away, lads," he said calmly. " It's time we werna here."

As we moved off everyone crowded their congratulations on him. Then McSwindle asked : " What would be the cause of all the noise ? "

" That'll be the Teuchle Toorie boys," McGillicuddy answered. " I doubt the keeper has caught them."

Continued on page 25.



AILERON CONTROL FOR MODEL GLIDERS

BY P · LATHAM

HAVING read many varied and interesting articles concerning methods of making turns with model aircraft, especially gliders and sailplanes, I note that they have all depended on permanent or automatic settings of the rudder. In my early aeromodelling career I accepted this without question. However, having had some experience in flying the real thing, both gliders and powered aircraft, I find a great discrepancy with full-size practice.

An aircraft should not be ordinarily turned by the effect of one control alone, but if a choice has to be made between the rudder and the ailerons, the latter would undoubtedly be used. A small amount of elevator is required in the turn, assuming that the turn is only a gentle one and is not steep. A greater use of the elevators is required if the turn is made incorrectly by the use of only one control, e.g. the rudder or ailerons. It is noticeable, however, that the turn is better and needs less correction if it is made solely with the ailerons. On high performance aircraft, very little rudder at all is required to execute a perfect gentle turn. All this sounds very practical and without adequate reason. An examination of the theory of the turn, and the effects and further effects of the controls, will help to explain the matter.

Firstly consider the present method of turning models by use of the rudder. The primary effect of the rudder is to create a movement in the yawing plane as in fig. 1. The aircraft is skidding sideways out of the turn. The further effect of the rudder now comes into play. The outside wing is travelling faster than the inside wing and so obtains more lift. This extra lift tends to bank the aircraft in the required direction. At this point everything in the garden is lovely, but it does not last long.

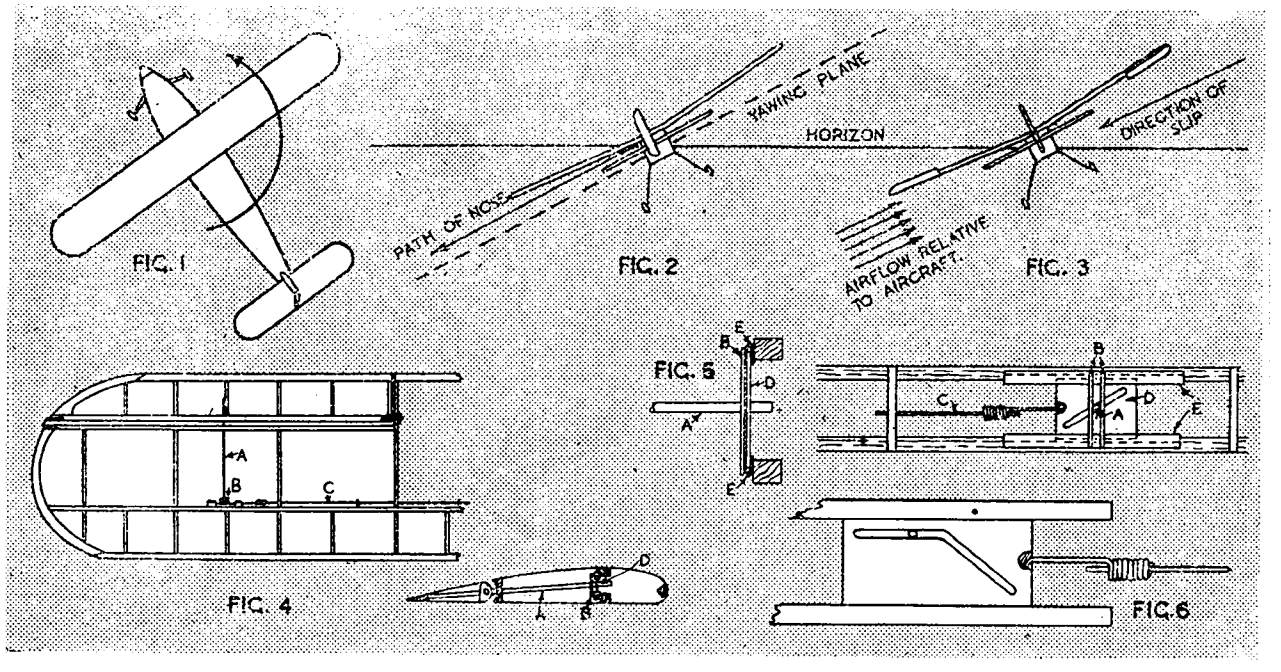
The position of the aircraft can be assumed to be as in fig. 2. It is a fact that no matter where the aircraft may be in relation to the earth, the control surfaces have the same primary effect. Therefore the rudder will still cause the aircraft to yaw, even if the yawing plane is at an angle to the horizon as in the diagram.

It will be seen from the diagram, that if the aircraft continues to yaw, the nose will fall below the horizon. The aircraft will then tend to be spiralling down to earth while making its turn. From this it can be concluded that in the case of a model sailplane the angle of glide is steepened considerably by a turn with the rudder. In the case of a duration model, either petrol or rubber driven, which is making climbing turns, a good proportion of the energy derived from the motor is used in counteracting this tendency of the nose to drop.

Now to consider turns made by the ailerons alone. The primary effect of the ailerons is to cause a movement of the aircraft in the rolling plane. The further effect is to cause the aircraft to sideslip in the direction of bank. When the aircraft is banked it tends to slip towards the lower wing. The resultant pressure on the fin and keel surfaces turns the aircraft since there is more effective keel surface behind the C.G. of the aircraft than in front. (See fig. 3.) This weathercock action of the keel surfaces also overcomes the other further effect of the ailerons, namely aileron drag, which turns the aircraft in the opposite direction to the bank. This latter effect is due to the drag of the aileron which is depressed and has a large angle of attack being greater than the drag of the aileron which is raised and has a small angle of attack.

Although the aircraft still loses height in a turn when it is made on the ailerons alone, the height lost is not so great as in turns in which the rudder only is employed.

Having verified this for myself in full-sized aircraft by making some really disgusting turns (I lost over 300 feet in one gliding turn without ailerons !), I set about adapting my ideas to model practice. During a leave I unearthed several old all-balsa gliders of 12–18 in. span and selected those with a consistent performance. On a very calm day, in the late evening, they could be flown repeatedly with the duration varying for any certain trim only with the strength of the



launching throw. To my great delight I found that the duration of the models if they were trimmed to fly in circles by use of the small cardboard tabs on the wings was greater than if a tail tab was used. I also found that it was not necessary to have two aileron tabs but only one on the inner wing of the turn. This produced the same effect as the differential aileron of the full-size aircraft, eliminating the counter yaw due to aileron drag.

For a model of the power-driven type which is permanently set to make a gentle turn it would seem to be a better method of control, but to the glider experts and the automatic pilot enthusiasts it would appear to cause an extra complication which would cancel out the value of the cleaner turn. However, having once been inflicted with the craze for pendular control I hit upon a method of aileron manipulation which is extremely light (it was used on a Kirby Kadet of only 22 in. span), easy to make and completely enclosed.

A length of 16 s.w.g. piano wire, or a long needle (A) is firmly attached to the aileron as in fig. 4. It is held between two guides (B) allowing it only a vertical movement. A piece of thin piano wire (C) is brought along the wing from its root, preferably at its thickest point, which carries the movement of the release hook, pendulum, servo motor, or whatever is being used. To the end of the wire is attached a small piece of tin or aluminium (D) (see fig. 5). The piece of tin is free to move between two slides (E). The attachment of the wire (C) to (D) is made as follows :—

A length of thin soft wire is wound round a length of wire of the same thickness as (C). In this way a ¼ in. or so of tube is made. The surplus wire is cut off at one side and on the other it is used to form an attachment to the part (D), either by soldering or by being hooked. The wire (C) can then be forced into this home-made tube which will allow for any adjustments to be made.

A slot is cut in the tin in which the end of the arm (A) can slide. The slot is cut at an angle so that longitudinal movement of the wire (C) will cause a vertical displacement of the end of the arm (A). For ease of working the slot should never be more than 45 degrees to the horizontal, preferable about 30 degrees. If both ailerons are to be used they can be made differential (i.e. the upward movement of the aileron is much greater than the downward movement) by adjusting the shape of the slot (fig. 6).

In order to get the ailerons accurately set, and to facilitate rapid adjustment, the arm (A) can be made of soft wire which can easily be bent by holding the wire (C) firm and moving the aileron. It will be noticed by the scholars of mechanics that although a most delicate touch to the wire (C) will easily move the aileron, a very considerable force must be applied to the aileron in order to move it and the controlling wire. In my own wing fitted with this device it was impossible to move the aileron by a force applied directly to it. The arm (A) preferred to bend instead. The wire (C) need only be moored down in one or two places along the wing; a small loop of wire is quite sufficient.

I hope that I have convinced readers of the need of more aileron control and less rudder control, on models of 3 ft. span and over it should be well worth while for the increase in duration and is really the more correct way of doing the job. This device would be particularly adaptable to Mr. A. Arnold's ingenious "Automatic Glider Control," described in the July issue of the AEROMODELLER. Perhaps some fortunate soul with more time than myself would care to combine them and produce a really startling model.

SPARK PLUG CLEANER. *Continued from page 45.*

in the position shown. It has a vertical bore 3/16 in. in diameter (for an air discharge nozzle of ⅛ in. outside diameter), through which sand is blown by venturi action against the spark plug. The air then travels between the baffle walls as shown by arrows and discharges through fabric-covered air discharge openings. Fabric is some loose mesh material such as worn but sound muslin glued to one of the end walls. Openings are formed by drilling and cutting.

To assemble the cleaner: air nozzle is screwed tightly into position, walls are glued together and sand nozzle is glued in position. After glue is set, sand the front till perfectly level.

The front is then covered with a piece of window glass cut to proper size and held in position with two strips of picture binding or scotch tape. Proper sanding results in a satisfactory airtight joint between the box and glass. Glass is used as a front wall so that operation of the cleaner and condition of the spark plug during such operation can at all times be observed.

After the cleaner is charged with sand it is ready for use. Ordinary sand of the proper size can be used, but carborundum grit is better. Fill the cleaner through the spark plug hole to about the extent illustrated.

Before inserting the spark plug in the cleaner, wash it twice with petrol, burning it out each time by touching a lighted match to it. This vaporizes any oil and dries the plug so the sand does its work without sticking between the shell and insulator, as will happen if they are gummed with fuel and oil. The carbon deposit on a plug may be softened somewhat by soaking it about a half-hour in a bottle of carbon tetrachloride. Don't shake the bottle! After sand-blasting a spark plug, be sure to carefully clean out any remaining sand or air blast to prevent it from getting into your engine and scoring the piston or cylinder. Incidentally, carbon tetrachloride tends to rust steel, and rust in an engine does it no good. A rusted plug should be cleaned with a suede shoe brush, having soft brass bristles, and the threads oiled. The hexagon body of the plug can be enamelled with stove enamel.

Many spark plugs that seem hopelessly fouled can be actually retrieved for many more hours of service by the use of a sand-blast cleaner of the kind described, and you will find it well worth the hour or so it takes to make it.

SOLO SORTIE. *Continued from page 23.*

Well, we should worry. A happy group set out for home, but I pulled the Maestro to one side.

"How was it you got it so easy, and the others were caught?"

He grinned at me in the darkness. "Tach—you mind what I said about the day I saw Tremble away at the station? Well, the proprietor and the head keeper were travelling on the same train—and the under keeper is a friend of mine, so I just went and told him some poachers were raiding his pheasants to-night and he was so grateful that he took me into the wood and helped me to get the glider down himself."

"Then you knew all the time there was no danger?"

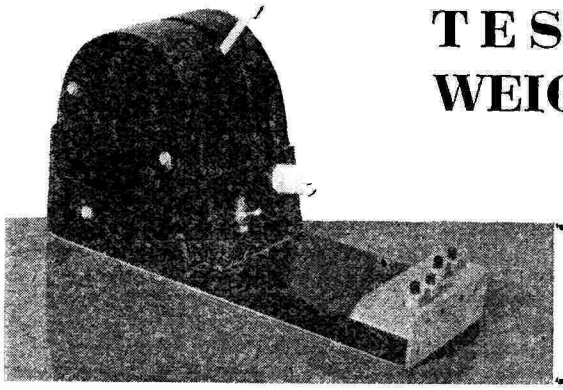
"Of course I knew, but there was no sense in an auld man like me going to all that exertion for nothing, and the reward has to go to the Club, so——"

I was too stunned to say anything.

"Let me see now—" he said, pulling a paper out of his pocket and striking a match to read it by. "Your bet was a balsa prop. block, two pairs of wheels and a length of 16 gauge wire—I'll have them in the morning."

TEST RIG FOR LIGHT-WEIGHT ELECTRIC MOTORS

DESIGNED BY J · S · EVANS

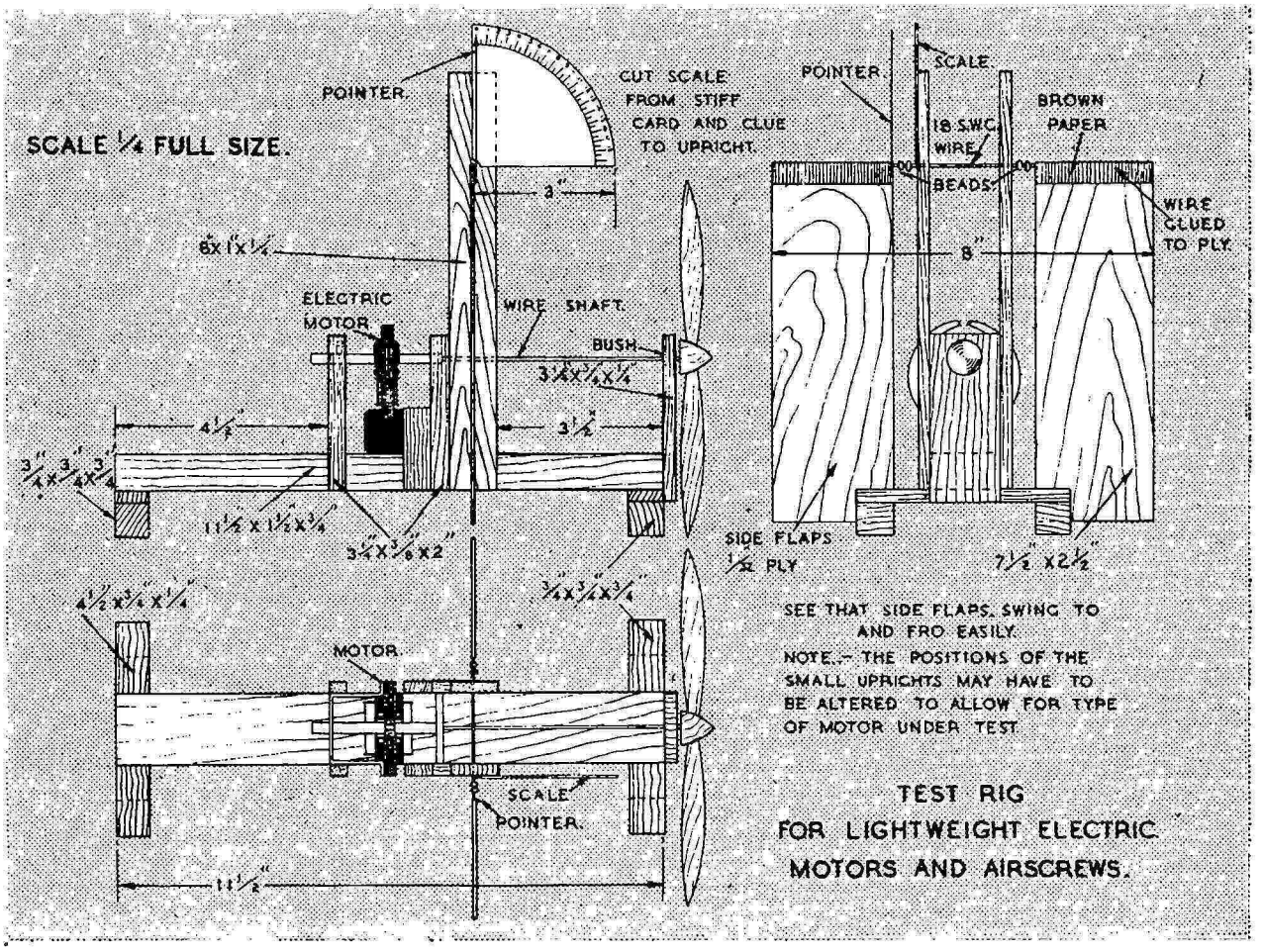


Left shows a control unit built by J. S. Evans which regulates the speed of his small electric motor incorporated in the Miles Magister shown opposite. By operating the control lever, one can take off or land the model at will.

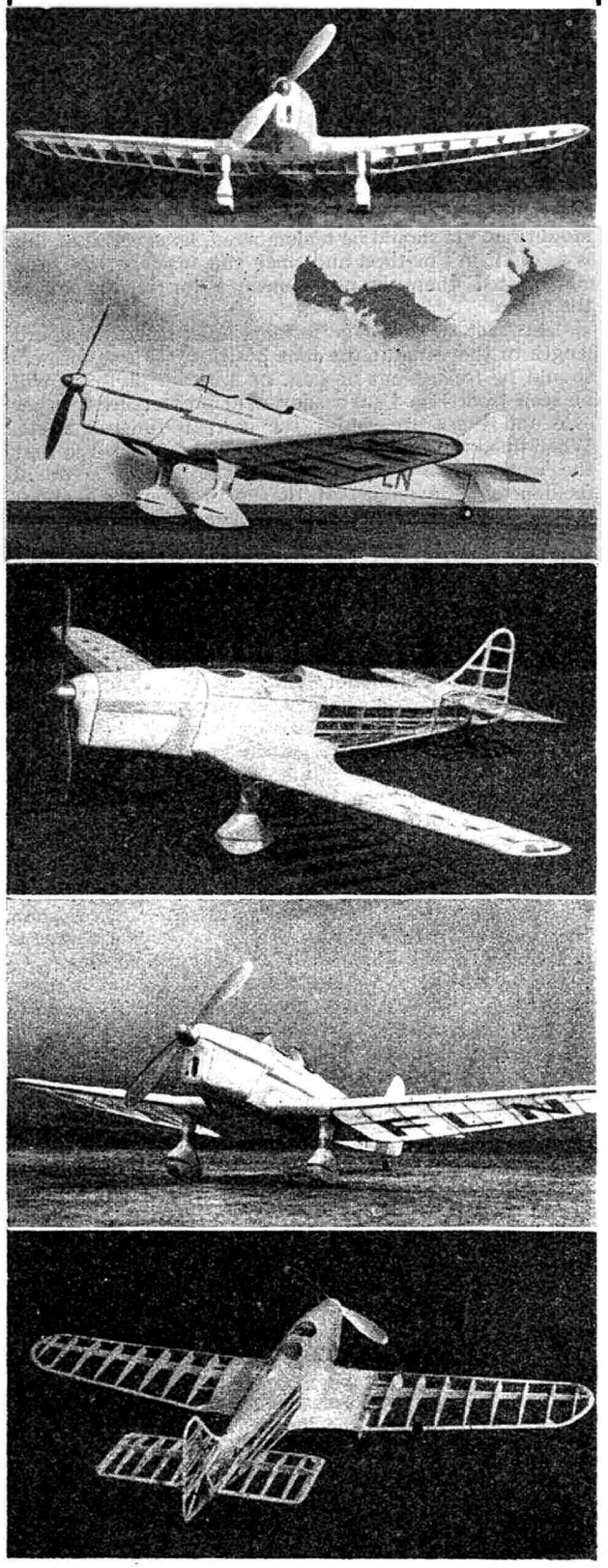
THIS test rig was designed in order to test the light-weight electric motor and airscrew for the electrically driven R.T.P. Magister shown in photographs on the opposite page. Without it the excellent power output of the motors would never have been obtained.

Construct the motor aiming at a high-power weight ratio, then place the motor in the rig using a test propeller of the diameter required, at the same time, using the correct voltage relevant to the windings of the motor. Then experiment with the motor until the highest reading on the scale is obtained.

The gauge of wire and number of turns on the field coil are governed by the voltage to be used. Some latitude is, however, permissible with the armature; a few turns more as a few less on each pole may make quite a difference to speed and power output. The best position of the brushes can easily be found by the reading on the Rig. When the motor has been wound and adjusted to give maximum power on the test propeller, attention is turned to the propeller to be used on the model. The pitch, width and camber are all very critical. Slight alterations show on the scale in no uncertain manner. It is very essential that the propeller is exactly suited to the motor.



This electrically driven Miles Magister will be demonstrated at the Aeromodeller Christmas Exhibition as announced on page 16.



GADGET REVIEW By "Bonus"

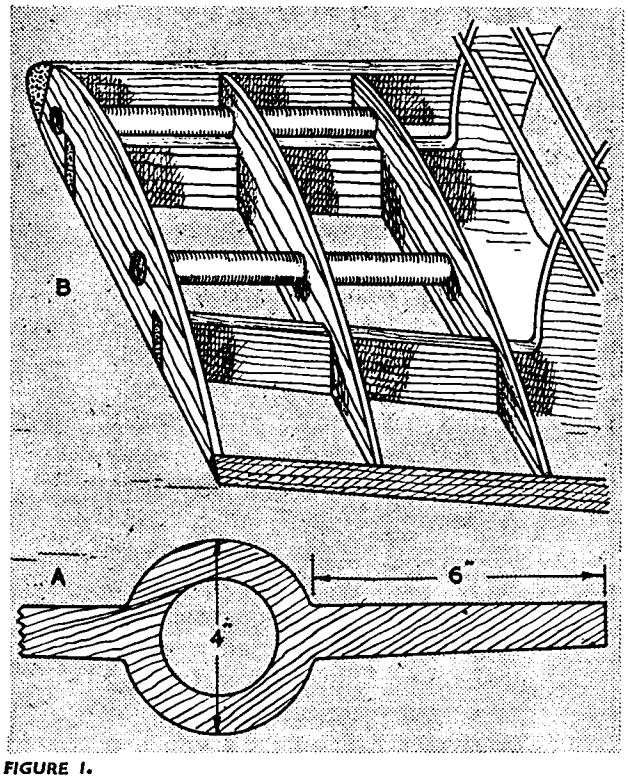


FIGURE 1.

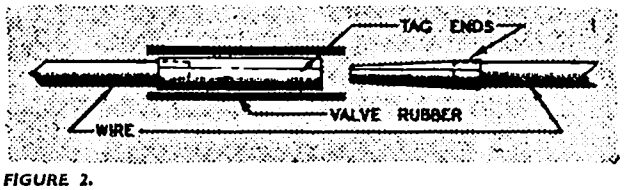


FIGURE 2.

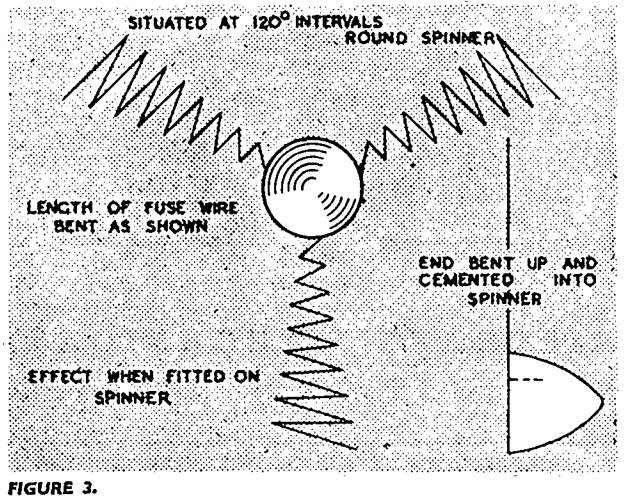


FIGURE 3.

A mid-wing by K. EDGERTON should interest modellers who employ this type of layout. Fig. 1 shows the mounting and here are Mr. Edgerton's remarks.

" The method here described should do a lot to overcome the troubles usually experienced with this type of mounting. It should be remembered, however, that this is a ' built-in ' method and once the fuselage has been constructed there is no allowance for movement of the wings.

" At least two fuselage formers must lie in the chord length of the wing at the root position. These formers should be fretted out of ⅛ in. or 3/16 in. ply. As will be seen from Fig. 1 (a) a short spar projects from either side and these are set at the correct dihedral angle. When lined up from the side they must be placed so that the wing, when attached, is at the correct angle of incidence. The length of the spars should be about 6 in. for a model of the Wakefield type.

" Ribs are threaded on to the spars and any of the usual methods of attachment may be employed. The type shown is of the plug and socket variety.

" In most cases the ply formers will be found to be of sufficient strength but, of course, either additional formers or bracing may be employed as required."

Now that petrol model flying is again taking place in certain parts of the country, many modellers will no doubt be interested in electrical circuits. Poor connections mar the performance of many otherwise excellent machines, and joints which require to be taken apart frequently are often a source of trouble. F. DUDLEY, of Nottingham, has solved this problem in a very neat way. Diagram 2 shows his brainchild. It is nothing more than two tags taken from loose-leaf binding cords. One tag " push-fits " into the other and the ignition wires are soldered to either end. A short length of valve tubing may be slipped over the tags to prevent the possibility of shorts. A very neat idea.

Having seen a request from an AEROMODELLER reader for an alternative covering material to tissue or bamboo paper, P. J. ASHTON experimented with draughtsmen's linen. He found that if this is washed in boiling water for about ten minutes with a little soap, it becomes a white cotton fabric similar to a fine cambric. He states that it is rather heavier than silk but very tough when doped. The fabric is wetted and attached to the framework by means of a water glue. Then, when the glue has dried, the fabric is wetted again and doped *while wet*. Although this is not the usual procedure, Mr. Ashton states that if this is done the material tightens up well, whereas if it is doped dry about four coats are needed to obtain the same result. Draughtsmen's linen costs about four shillings a yard and is coupon free. Old drawings will wash out just as well and the linen will probably be finer, being of pre-war quality.

R. W. DEWAR has a neat idea for imitating airscrews in motion on solids. The blades are formed from lengths of fuse wire as shown in diagram 3. No further explanation should be necessary.

The cutting of accurate circles out of sheet balsa brings a headache to many modellers. K. A. REYNOLDS, of Warwickshire, has a simple tool for

dealing with the problem. He uses a pair of compasses, to which is fitted a short length of dowel gripping a piece of razor blade.

C. A. RIPPON, the well-known modeller, will need no introduction to the majority of readers. He is one of the pioneers of the hobby who has been responsible for dozens of inventions and devices for improving the flying model aircraft. This scheme he calls the " Rip " Dovetail Wing Fixing. Mr. Rippon gives the following instructions which should be studied in connection with Fig. 4.

Make two root ribs A and C of a suitable thickness according to the size of wing to be built. Make a " dovetail " of say 3/16 in. thick, for a 36 in. wing, or up to ¼ in. thick, for a 6 ft. span wing. Cut the dovetails, making sure that in the vertical sense they are at 90 degrees to base. Glue sections 1, 3 and 5 to rib A, using 2 and 4 as distance pieces. (Be sure no cement or glue inadvertently fixes Nos. 2 and 4.) When set remove 2 and 4 and glue them to section C, locating them by rib A and its glued sections. When all is set it will appear as in the lower diagram. It will be seen that it is then an easy matter to build the wings on to the assembly.

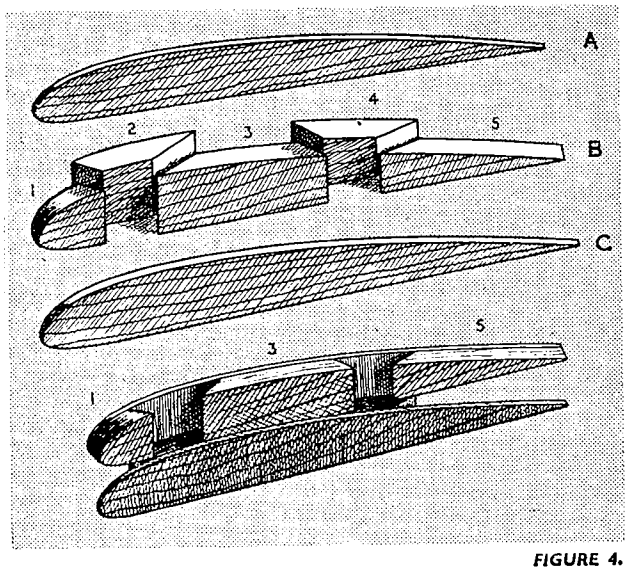


FIGURE 4.

Airscrew blades are, at the best of times, delicate articles. How often has an afternoon's flying been spoilt by the early breaking of a blade by some unfortunate mischance? J. WALLER, of Forest Hill, S.E.23, has hit upon an excellent idea for taking care of this trouble. Reference to diagram 5 will show that the root end of the blade is carved to a wedge. The airscrew hub or spinner is carved from soft balsa and has wedge-shaped recesses cut into it. Into these grooves the root ends of the blades are cemented. Care must be taken throughout that the blades are correctly placed in relation to each other. It will be found that a blow on a blade of sufficient strength to smash it, will, in fact, cause the balsa hub to split first, thus saving the blade. It is then quite a simple matter to glue the blade back into position.

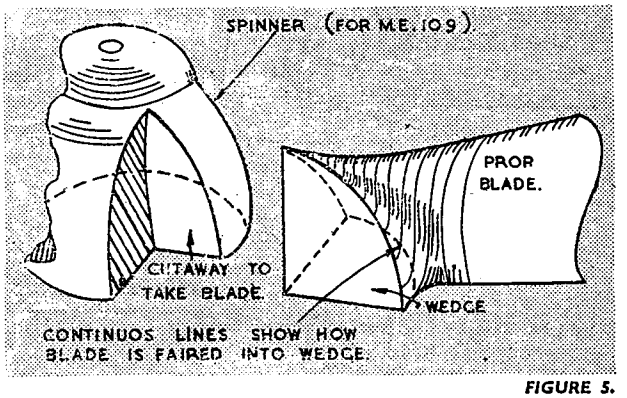


FIGURE 5.

An automatically operated slot has been devised by J. FORSYTH, of Thame, Oxon., who says he has successfully used it on his Ivory Gull. Fig. 6 shows the working layout. The slot is constructed from 1/16 in. sheet balsa and has an aluminium connecting rod cemented to it. The smaller rod is pivoted as shown, care being taken so that the distance between the weight and the pivot is smaller than that from the pivot to the connecting rod. The small streamlined weight, the size of which will be best found by experiment, is glued to the lower end of the pivoted rod.

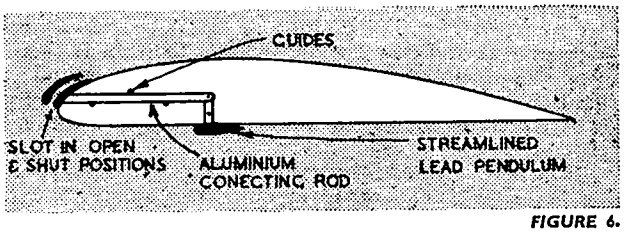


FIGURE 6.

Effective and really light bombs may be made from three-halfpenny lighter fuel tubes. D. PRITCHARD, of Bognor Regis, is the " inventor." Fig. 7 shows the stages of construction. After the tube has been cut (and the petrol run out!), two fins are cut out of thin card. These are slotted as shown, fitted together and glued. When dry a further piece of card is wrapped around the vanes, glued and held in place with cotton or a rubber band until dry. All that now remains is to paint the bomb.

Here is a cunning device for steaming strips of wood, sent in by A. STEPTO, of Hounslow, Middlesex. A cycle inner tube is cut across its diameter about 3 in. from the valve. The end nearest the valve is then sealed by rubber solution and thread binding. The valve rubber is removed and the valve replaced. When the solution is dry a strip of hard wood about ¼ in. square is inserted into the tube for stiffening purposes. The wood to be steamed

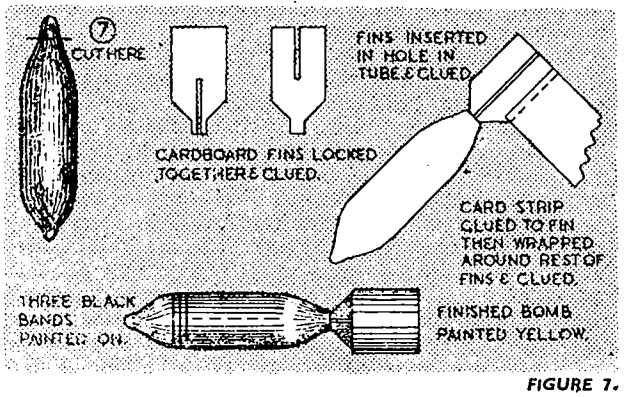
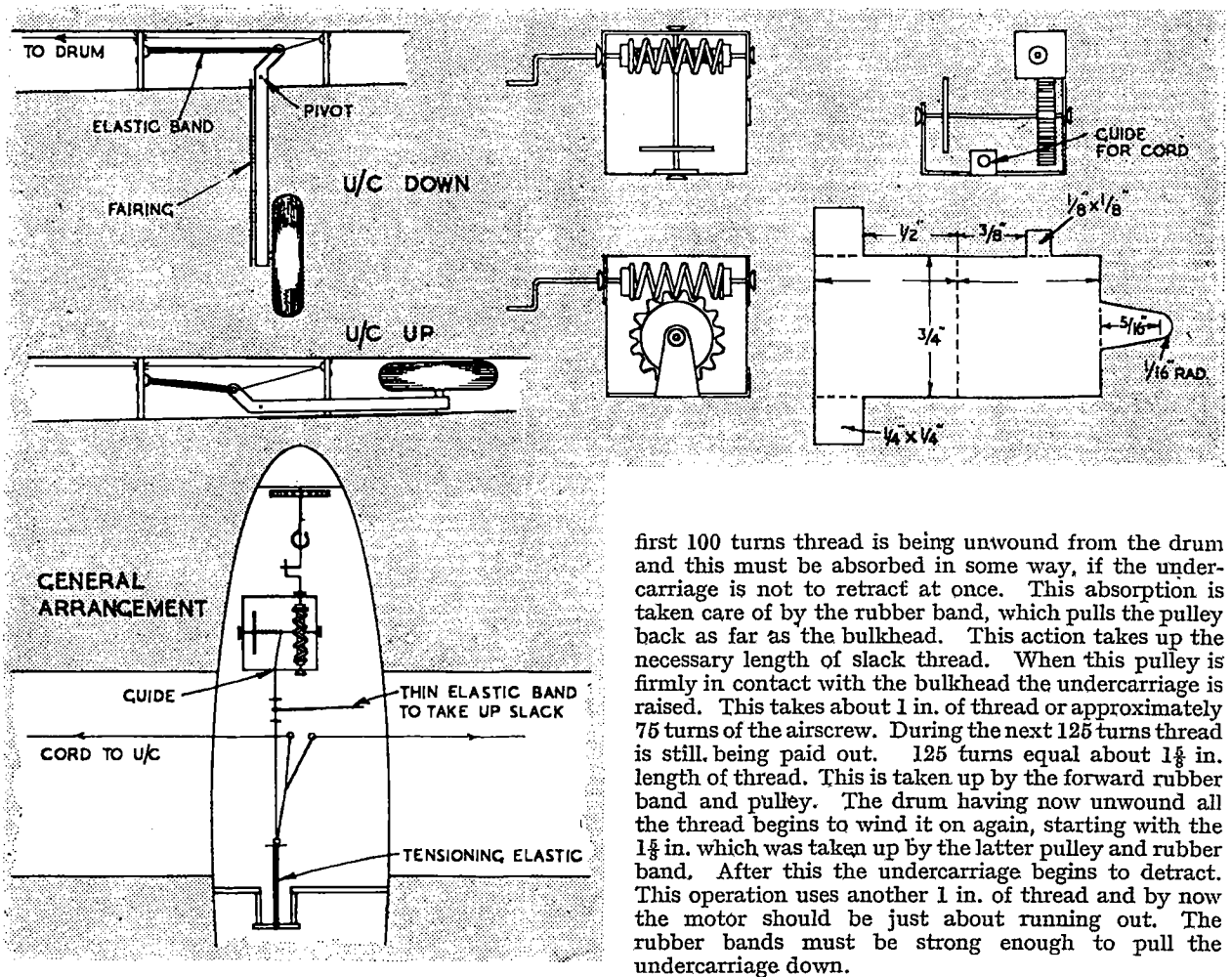


FIGURE 7.



goes in next and then the open end of the tube is placed over the spout of a kettle and temporarily bound in position. When the water boils steam will pass into the tube, circulate round the timber and exhaust through the valve.

Now here is an undercarriage retracting gear sent in by S. G. WHITE, of Liverpool. The sketch above shows clearly the working details. No actual constructional notes are given as this is a case where the individual modeller would have to adapt the mechanism to his own particular needs.

Mr. White gives the following points in elaboration of the diagrams. The spring which forms the worm gear is taken from an ordinary electric globe socket. The 16 S.W.G. shaft does not run through the spring itself but is soldered to a small piece of brass tubing which is in turn soldered to the spring. The successful operation of the mechanism depends upon the length of thread to be wound on to the drum. The drum, being approximately 1/16 in. diam., will wind on about 1 in. of thread in $4\frac{1}{2}$ turns. As the worm wheel is turning a 17-tooth gear wheel it will take $17 \times 4\frac{1}{2}$ turns of the airscrew to wind 1 in. of cord on to the drum. If we assume, for sake of example, that the rubber motor to be used will take 500 turns, the model should leave the ground after about 100 turns have been unwound. During these first 100 turns thread is being unwound from the drum and this must be absorbed in some way, if the undercarriage is not to retract at once. This absorption is taken care of by the rubber band, which pulls the pulley back as far as the bulkhead. This action takes up the necessary length of slack thread. When this pulley is firmly in contact with the bulkhead the undercarriage is raised. This takes about 1 in. of thread or approximately 75 turns of the airscrew. During the next 125 turns thread is still being paid out. 125 turns equal about $1\frac{5}{8}$ in. length of thread. This is taken up by the forward rubber band and pulley. The drum having now unwound all the thread begins to wind it on again, starting with the $1\frac{5}{8}$ in. which was taken up by the latter pulley and rubber band. After this the undercarriage begins to detract. This operation uses another 1 in. of thread and by now the motor should be just about running out. The rubber bands must be strong enough to pull the undercarriage down.

Summing up Mr. White's notes, we find that 112 turns are allowed for take-off, 75 for retraction, 125 plus 125 idling and 75 for detraction The length of thread depends on the diameter of the drum, the number of airscrew turns required to wind on 1 in. of thread, the length of the motor run and the length of thread needed for actual retraction.

C. CHAPLIN, of Keswick, Cumberland, makes rubber motors from cycle inner tubes. He states that if the tube is cut spiral-wise, having been placed on to a broom handle for this process, the resulting strip, will stand 70 per cent. of the turns advertised by Messrs. Caton, for their rubber. Care must be taken in cutting the tube to maintain constant width of the strip and small nicks must be avoided as these lead to breakage. Mr. Chaplin does not claim that motors made in this way are as good as the normal variety, and they are heavier, size for size. On the other hand slightly more power seems to be obtained.

N. GILCHRIST, of Northumberland, has two tips for the lightweight and R.T.P. fans. The first is for utilising small spinners, which are readily obtainable from most model shops, even in these hard times, for noseblocks on lightweight models. They should be shaved down and cemented to a small balsa block. When dry the two are mounted on the motor stick.

For the second tip Mr. Gilchrist suggests using short lengths of valve tubing for lightweight freewheel springs.

ARE YOU • A MEMBER ? •

BY ARTHUR LODGE

We print the following article by Mr. Arthur Lodge, M.C., Secretary of the Association of British Aeromodellers, and draw particular attention to one paragraph that

> *"The happy life can only be lived if one is concerned more with putting something into the common pool of life than fishing something out of it. I believe it to be a good principle in life for a man to earn his living by working at something in which he sincerely believes."*

This paragraph might well be read and studied carefully and, in fact, considered by those aeromodellers—fortunately in a considerable minority—who tend to regard any new thing from a selfish viewpoint. In so many words, their attitude is "what can I get out of it?" The answer, of course, as any experienced man knows, is "what they put into it."

"THIS is your office," said my guide, and to my dismay he pointed to a building the plate glass windows of which were scattered in a thousand small pieces at our feet. "It was blasted yesterday by a doodle-bug which fell nearby," he explained. Peering into the gloomy, empty, and dilapidated-looking interior, I replied that I feared weeks would elapse before it would be usable. "Oh no," he replied, cheerily. "We'll have it shipshape in a few days. You'll have much more trouble finding furniture. Do you know your way about London? You'll find plenty of second-hand shops over the road"—pointing vaguely eastwards —"Go and see what you can find; good luck and cheerio."

Thus was I introduced to the Headquarters of the A.B.A. at the beginning of August.

By the time the Council met at the end of August, the Headquarters was gay with models and photographs, the office was equipped with at least a minimum of the necessary furniture, a stenographer had been engaged, and above all the cleanliness of everything and everyone at No. 28 had been assured by the finding of a char! Although male in gender, the char, who goes by the name of John, is a real find and at some time of his life, judging by the way he attacks the floors, must have served in the Navy. In addition to his passion for cleanliness (I am sure he will one day peer behind my ears as my mother used to do), he is full of sound philosophy about Life and has a great belief in his fellow men. Once in the early days of our acquaintance he enquired: "What do you hope to *do* for modellers?" I like the question so much better than the one I had just read in a letter from a young man who wanted to know what he would *get* out of becoming a member. John's question, it seems to me, gets the cart and the horse in the right relationship to each other for forward movement. If one is trying to obtain something for the other fellow, it usually happens that a personal gain of some sort is made, whereas a policy of "grab" often leaves the successful one sitting forlorn and alone upon a heap of the material or other possessions amassed.

I will go further, and say that the happy life can only be lived if one is concerned more with putting something into the common pool of life than fishing something out of it. I believe it to be a good principle in life for a man to earn his living by working at something in which he sincerely believes—and here let me say how glad I have been to meet in the aeromodelling trade so many men who are in the business not exclusively, nor possibly even primarily, for profit; but because they are enthusiastic modellers and prefer to earn their living doing something which expresses their interests and personality.

But to continue: When I took on my present job, I did so not because I believed in it—I knew nothing about it—but because for personal preference I wanted to live in the South. For thus foolishly breaking faith with a principle, I deserved to suffer, but Providence does indeed look after fools, for although I have been the Secretary of the A.B.A. for only a short time, I have already found that aeromodellers are not just people who make and fly models, but that there is behind the Movement a spirit in which I can most certainly believe, for which I can work with my whole enthusiasm and which satisfies my desire to be putting something into life.

Let me try to explain what I mean. I have talked to young men in the Army, Navy and Air Force, and almost without exception they have told me that the outstanding thing they have learned to-value as serving men is the wonderful spirit of friendship which exists amongst men of all ranks. Many of us know from experience that the last War produced the same deep friendship and understanding between men, and after the Armistice many societies were formed to preserve this newly-found spirit. But a spiritual thing cannot be preserved like food in a refrigerator. It lives by being exposed to light and life, and by being free to adapt itself to changed circumstances, and by being capable of translation into some form of action. Mostly the societies died (although often enough life was not pronounced extinct), because we thought a few drinks in a club, or a pow-wow about the War, would take the place of the common task which had formerly bound us together. Peace-time conditions parallel to those of War cannot be easily produced.

But here, you makers of models have something which

is not artificial. You are absorbed in your hobby and if anyone will listen to you, try to understand you and share with you his ideas, you welcome him as a friend. His birth, school and rank matter not a whit. His branch of politics or religion is incidental. Furthermore, the absorbing interest is not aimless, as that of a man who whittles a stick or carves his name on a tree. It is creative—it ministers not only to man's deep instinct to express himself artistically by the work of brain and hands, but it makes a contribution to one of the most vital of the post-war problems—flight—the conquest of the air—and the necessity for at least a nucleus of the population of Great Britain to be air-minded.

I have found already amongst aeromodellers a quality of fellowship such as the world badly needs, which is not the result of war, but is a product of peace. I am not of course so foolish as to think that everyone should become an aeromodeller, but I would like to feel that the spirit of comradeship which characterises the aeromodellers I have met, could become universal in men's dealing with each other. All the world acknowledges the British sense of fair play, and we all know that this quality has been built in us very largely whilst we were young by the way in which we were taught to play games. Actually these rules of conduct grew up gradually, and were finally codified by some national body into a set of rules accepted by all for that particular game or sport.

I find that traditions have grown, even in this young movement, and I want us to see that not the least important of these is the kind of relationship we have with each other. I would say therefore as a first reason to any who hesitate upon the brink of joining: "Come in and help us to build not only a national aeromodellers' association, but also groups of friends—which shall be second to none."

Each of us naturally wants to get the best he can out of the hobby, but only by pooling our resources will this be possible. Alone, one feels out of touch and problems seem more difficult. Already we are receiving letters from all over the world from isolated modellers serving in the Forces and one note is common to all of them: they are glad that an Association has been formed to which they can belong, to the offices of which they can write on aeromodelling subjects and to which they can send their problems for other enthusiasts to help with.

This is no profit-making affair trying yet another dodge to separate a man from his money, but an honest attempt to put the aeromodelling movement in its proper place in public affairs, and to secure for its members such benefits as common effort properly directed *can* achieve.

Let me enumerate some of the services we can already give before outlining my personal hopes for the future. There is now for the first time a small staff working full-time in the service of aeromodellers, and a Headquarters which will increasingly become the centre of activities of all kinds: lectures, film shows, meetings, and so on.

Members and Associates are automatically covered against Third Party risks whilst flying, and are issued upon joining with 12 free transfers bearing the A.B.A. design which heads this article. (Further supplies of these are available to members at special rates.) A Membership Certificate and a pocket card bearing details of his membership are issued to each member.

Committees are in process of formation for each of the separate sections of membership, and an illustration of the benefits a member derives from belonging to a section is afforded by the National Competitions, the first of many which the Section Committees will arrange Entry to these competitions will be free to the members of each section concerned. Non-members are invited of course, to take part in the competitions, but are asked to pay a small entrance fee.

The Library Section has now the nucleus of its Reference Library, and members of the section are already using the facilities offered. Books are being added as rapidly as funds permit.

A plan has been made whereby certain retailers of aeromodelling materials and equipment will receive the approval of the Association. This will give protection both to aeromodellers, who will feel that when making purchases at an A.B.A. approved shop they can buy with confidence, and to those retailers who are primarily in the trade because of the interest they have to serve the aeromodelling movement.

It is perhaps not generally known that members are free to send any problem on aeromodelling to me, and that I will then endeavour to obtain a solution for them. I should explain that I am making no personal claims of omnipotence in these matters! Mine is a reflected glory, for I am surrounded by experts (of whom I am secretly afraid), each one thirsting to be used. Neither they nor I, let me hasten to add, can produce the impossible. We cannot rub our lamp and produce petrol engines, coils or balsa, but we shall be able to let our members know when commodities, now so difficult to get, may be obtained more easily, and where to apply for supplies.

As to the future, I visualise a headquarters in each area, with its own Council of Members selected from the districts within its jurisdiction, looking after local aeromodellers' interests and helping the Central Body with their advice.

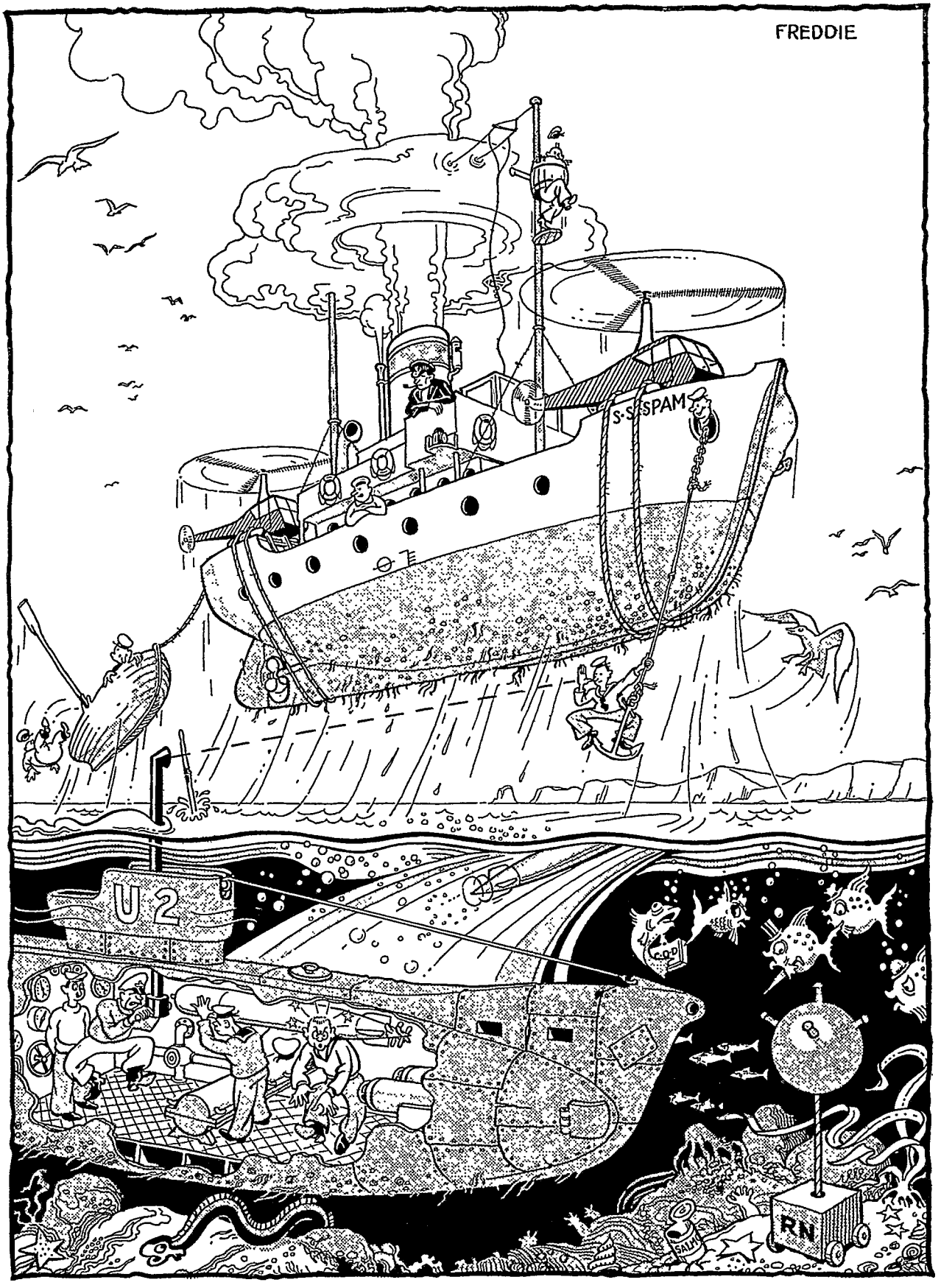
We shall be arranging frequent meetings, first in London but later in the Provinces, with speakers qualified to speak on subjects of special interest to our members, and a precis of each of these talks will be made available to our members. Many aeromodellers are, I know, giving attention and study to particular problems, and the Council invites any such modellers to send us papers on their special subjects for circulation amongst the membership.

I hope that kindred organisations will become affiliated with us, so that we may all pull together, pooling our resources for the benefit of all.

I visualise a series of aerodromes up and down the country set aside exclusively for the use of aeromodellers, and I hope in each there will be an A.B.A. clubhouse.

The time will come, not too distantly I believe, when there will be formed in Great Britain a Trust similar to the Rockefeller Foundation which in America has done so much to promote modelling, and which will have as one of its aims the provision of scholarships for young men wanting to devote their whole time to aviation. I believe it true to say that the aeromodelling movement is a kind of preparatory school for the Aircraft Industry, and we ought to be able, therefore, to help our young members to find the sort of job they are wanting. Meanwhile everything the Council can do will be done to encourage members to progress in craftsmanship and theory, so that the whole standard of aeromodelling in this country shall be raised to the highest possible level.

The Association gives a warm welcome to all new members, and I would like you to know that I personally will be equally glad to see any of my readers who care to come and see me at A.B.A. Headquarters, at 28, Hanover Street, W.1.



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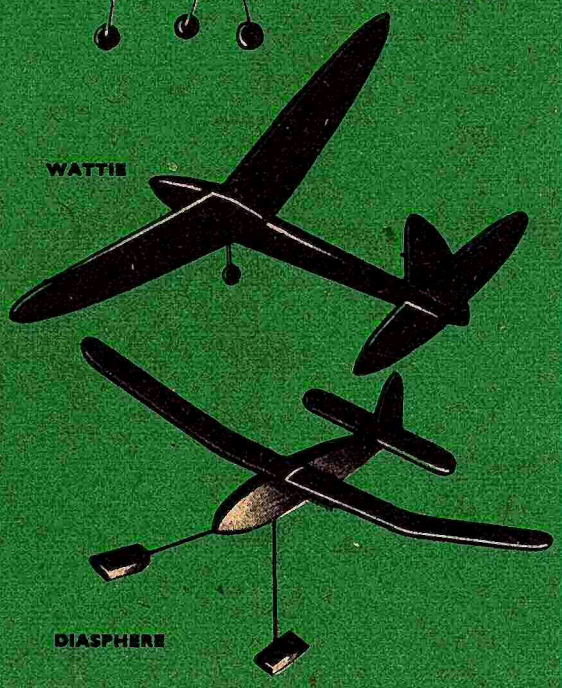
THE JEEP

THE JAY

W.A.D. 20



WATTIE

DIASPHERE

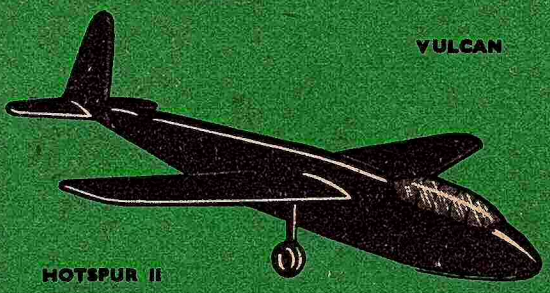
Semi-Scale Plans

JACKDAW

G.B.2.

GYFORD GULL

VULCAN



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R. W. D. 8 POLISH TRAINER. By A. Welsberg. Scale model of the parasol wing Polish light aircraft, can be powered with engines of 10 c.c. 67 inch span. 8/3

SPITFIRE II. By J. F. P. Foster. A low-wing model based on the famous British fighter. 63 in. span. 6 c.c. engine. 8/3

WESTLAND LYSANDER. By A. Welsberg. Another design by an expert known for his excellent workmanship. Will take engines of 2.5 c.c. 60 inch span. 7/0

VULCAN. By D. A. Russell. A high-wing model, suitable for radio control. 9 c.c. engine. 96 inch span. 9/0

Indoor Models

BABY MICROFILM & BABY MICROFILM 4 MINUTES. By R. H. Warring. Two tiny models that will give plenty of fun in a small hall. 9 inch span each 2/0

R.T.P. HELICOPTER & R.T.P. ORNITHOPTER. By R. H. Warring. Two out of the ordinary types that will interest all modellers. 2/0

R.T.P. SPAR & R.T.P. FUSELAGE. By R. H. Warring. Two simple types very suitable for the beginner at indoor flying. 16 inch span each. 2/0

Glider Plans

INDOOR MODELS — continued.

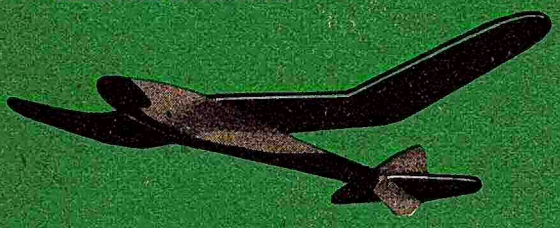
	Price post free
R.T.P. PUSHER & R.T.P. STREAMLINER. By R. H. Warring. Two high performance models for contest work. 20 and 24 inch span.	2/0
R.T.P. PTERODACTYL & R.T.P. COMPETITION. By R. H. Warring. A flying wing type, and super performance model for the clubman. 27½ and 16 inch span.	2/0
BABY R.O.G. By J. S. Isenberg. A small microfilm covered model, capable of flights of many minutes. 13 inch span.	1/0
CLASS "A" AUTOGIRO. By R. H. Warring. Specially designed for contest work, ideal for the experimenter.	1/0
LAZYBONES. By J. Senber. A large competition type microfilm model of proven capabilities. 25 inch span.	1/0
TANDEM MONOPLANE. By R. H. Warring. Unorthodox type of model that will appeal to all. 16 in. span.	1/0
CANARD. By R. H. Warring. Tail first flier that will cause plenty of comment wherever flown. 16 inch span.	1/0

Gliders

AEOLUS. By R. H. Warring. A highly efficient sailplane of the "pod-and-boom" type. 48 inch span	2/3
ATLANTA. By R. H. Warring. A contest sailplane with graceful lines. 52 inch span.	3/0
AEGEUS. By R. H. Warring. A glider for the beginner with an advanced performance. 42 inch span.	2/0
CELESTIAL HORSEMAN.* By L. G. Temple. A super detailed scale model of the designer's full-sized sailplane. The model for the advanced builder. 124.3in. span.	8/3
CRACOW. By L. G. Temple. The latest model from the Temple stable. 32 inch span.	3/0
CURLEW. By K. W. S. Turner. A small model of pleasing lines with flights of over five minutes. 46 inch span.	2/3
ELMIRA. By I. S. Cameron. Another high performance model. 62 inch span.	3/0
FIGHTER GLIDER. By D. M. Dent. An interesting scale type low wing glider. 42 inch span.	2/3
HORSA.* By I. H. V. Hayes. A flying scale model of the machine used by Allied Forces in the invasion. 88 inch span.	8/0
HOTSPUR II.* By R. H. Warring and W. A. Dean. A flying scale model with scale construction and a full-size performance. 46 inch span.	3/6
IVORY GULL. By R. F. L. Gosling. One of the most popular designs in the A.P.S. range, with a first class performance. 50 inch span.	2/3
KING FALCON. By R. E. Bowyer. A model with a guaranteed performance, designed on continental lines. 76 inch span.	4/9
KIRBY KITE.* By Dr. Ing. Piatelli. A scale model of the well-known English sailplane. 72 inch span.	3/0
LEANDER. By R. H. Warring. Another model particularly suitable for the beginner. 49 inch span.	3/0
R.F.L.G. 53. By R. F. L. Gosling. This tailless model has held the British record for its class. 60 inch span.	1/3
STOTHERS GLIDER. By K. L. Stothers. A mid-wing glider with planked diamond fuselage, holder of many club records. 50 inch span.	2/0
SUNCLIPPER. By A. H. Smith. Theory into practice! A model by the author of "Simple Aerodynamics." 60 inch span.	3/0
SOKOL. By L. G. Temple. A new model embodying low aspect ratio and high performance. 84 inch span.	7/0
TEMPLE TRIBUTE. By L. G. Temple. Another Temple top-liner! Winner of many contests. 83¾ inch span.	5/0
ZEUS. By R. H. Warring. A model for the advanced builder, with an aspect ratio of 21.7. 82 inch span.	3/0

* Flying Scale Models.

CELESTIAL HORSEMAN



KING FALCON

IVORY GULL

TEMPLE "TRIBUTE"

1/72 Scale Drawings

GREAT BRITAIN

Plan	Photo	
A/124	P/176	Airspeed Courier
A/116	P/70	Airspeed Oxford I
B/16	P/19	Armstrong Whitley III
*B/35	P/84	Armstrong Whitley IV
*B/16		Armstrong Whitley V
A/108	P/137	Armstrong Whitworth F.K.8
A/130	P/185	Austin Whippet
A/116	P/72	Avro Anson I
*C/11	Z/23	Avro Lancaster
*C/7	P/42	Avro Manchester III
A/9	P/169	Avro Tutor
A/104	P/150	Avro 504K
A/128	P/186	Avro 504K (Civil)
A/132	P/187	Avro 504N
A/128	P/186	Avro 548
A/114	P/159	B.E.2B
A/106	P/144	B.E.2C and 2D
A/114		B.E.2E
A/90	P/159	B.E.12
*B/15	P/40	Blackburn Botha I
B/47		Blackburn Kangaroo
A/63	P/80	Blackburn Roc I
A/84		Blackburn Skua II
A/32		Boulton-Paul Defiant
*A/75		Bristol Beaufighter I
A/38	P/98	Bristol Beaufighter II
*B/35	P/83	Bristol Beaufort I
B/34		Bristol Beaufort II
*B/39	P/125	Bristol Blenheim I & IV
*A/75	P/41	Bristol Blenheim IVF & IVL
C/7		Bristol Bombay I
A/87	P/152	Bristol Bullet (D Scout)
A/103	P/152	Bristol F2B Fighter
A/87	P/136	Bristol Monoplane
A/67	P/5	British Taylorcraft D
A/26		de Havilland Dominie I
*B/19		de Havilland Hertford I
A/56		de Havilland Hornet Moth
*A/13	P/120	de Havilland Mosquito IV
A/28		de Havilland Tiger Moth II
A/101	P/140	de Havilland 1a
A/100	P/139	de Havilland 2
A/100	P/162	de Havilland 4
A/127	P/184	de Havilland 4a
A/99		de Havilland 5
A/99	P/140	de Havilland 6
A/98	P/139	de Havilland 9
A/98		de Havilland 9a
B/44	P/154	de Havilland 10
A/131	P/182	de Havilland 18
A/131	P/184	D.H. 53 Humming Bird
A/122	P/175	D.H. 60M Gypsy Moth
A/118	P/174	D.H. 80a Puss Moth
A/122	P/175	D.H. 83 Fox Moth
A/118	P/174	D.H. 85 Leopard Moth
B/38		de Havilland D.H. 86B
A/20	P/71	Fairey Albacore I
A/69		Fairey Battle I
A/27	P/29	Fairy Battle (T)
A/125	P/183	Fairey Fantome
A/82	P/82	Fairy Fulmar I
A/29		Fairey Seafox I
A/16		Fairey Swordfish I
A/89	P/156	F.E. 2B and 2D
A/90	P/157	F.E.8.
*A/85	P/121	General Aircraft Hotspur II
A/67		General Aircraft Owlet
A/57	P/127	Gloster F5/34
A/81		Gloster Gladiator II
*B/15		Handley-Page Hampden I
*C/6	P/43	Handley-Page Halifax II
B/37	P/185	Handley-Page Heyford III
B/46	P/170	Handley-Page 0/400
B/46	P/170	Handley-Page V/1500
A/130	P/183	Hawker Cygnet
A/56	P/131	Hawker Hector
A/54	P/127	Hawker Henley I
A/55		Hawker Hind T
A/81		Hawker Hurricane I
*A/72	P/30	Hawker Hurricane II
A/35	P/115	Hurricane II Bomber
A/124	Z/27	Hawker Typhoon
A/125	P/181	Heston-Napier Monoplane
A/129	P/187	Hillson Praga
A/95	P/149	Martinsyde Buzzard F.4
A/95		Martinsyde Elephant G100
A/31		Miles Magister I
A/30		Miles Master I
*A/72	P/16	Miles Master II
A/44	P/115	Miles Master III
A/27	P/12	Miles Mentor I
A/117	P/173	Miles M-28
A/22	P/8	Percival Q6 Petrel
A/22		Percival Proctor I
A/30	P/117	Reid & Sigrist Snargasher
A/104	P/136	R.E.8
B/31		Saro Lerwick I
B/13	P/72	Saro London II
A/121	P/178	S.E.4
A/110	P/145	S.E.5a
B/44	P/162	Short N2B
A/113	P/148	Sopwith Pup
A/113	P/148	Sopwith Baby
A/91	P/146	Sopwith Camel F.1
A/103	P/146	Sopwith Dolphin
A/110	P/147	Sopwith 1½ Strutter
A/112	P/154	Sopwith Snipe
*C/6	P/43	Short Stirling I
C/8	P/87	Short Sunderland I
C/12	Z/28	Short-Mayo "Mercury"
C/12	Z/28	Short-Mayo "Maia"
A/119	P/172	Sopwith Salamander
A/91	P/147	Sopwith Tabloid
A/109	P/144	Sopwith Triplane
*B/19		Supermarine Stranraer I
A/1		Supermarine S.4
A/1	Z/1	Supermarine S.5
A/2	Z/1	Supermarine S.6
A/2	Z/1	Supermarine S.6.B
A/68		Vickers Armstrongs Spitfire II
*A/73		Vickers Armstrongs Spitfire III & V
A/31		Vickers Armstrongs Wellesley I
*A/14	P/16	Vickers Armstrongs Wellesley II
*B/39		Vickers Armstrongs Wellington 1a
B/34		Vickers Armstrongs Wellington II & III
A/28	P/71	Vickers Armstrongs Walrus II
A/89	P/158	Vickers F.B.5 & F.B.9 Gunbus
A/68	P/80	Westland Lysander II
*A/69	Z/5	Westland Whirlwind I

U.S.A.

Plan	Photo	
A/48	P/101	Aeronca L-58B Defender
A/70	P/102	Beechcraft C-43
A/49	P/120	Beechcraft 18
A/16		Bell Airacobra (Prototype)
*A/19	P/37	Bell Airacobra I
*B/43	Z/14	Bell FM-1a Airacuda
*C/10	P/28	Boeing Fortress I
*C/11	Z/4	Boeing Fortress II (B-17E)
A/83	P/112	Brewster Bermuda I
A/84		Brewster Buffalo I
A/64	P/3	Cessna Crane I
C/3	P/83	Consolidated 28-5
*C/10	P/42	Consolidated Catalina I
C/5	P/28	Consolidated Liberator I
C/1	Z/2	Consolidated PB2Y-3 Coronado
A/119	P/180	Curtiss JN-4a
B/30	P/126	Curtiss A.18
A/61	P/74	Curtiss Cleveland I
A/60	P/130	Curtiss CW.21
*C/1	Z/18	Curtiss C-46 Commando
A/15		Curtiss 75a Hawk
A/82		Curtiss P-40E Kittyhawk II & P-40F Warhawk I
A/73	P/32	Curtiss Mohawk IV
A/83	P/108	Curtiss SB2C-1 Helldiver I
A/47	P/111	Curtiss O-52 Owl I
A/53	P/132	Curtiss SOC-1 Seagull
A/53	P/132	Curtiss SO3-1 Seagull I
A/32		Curtiss Tomahawk I
*A/17	P/38	Curtiss Tomahawk II
A/62	P/128	Curtiss YP.37
B/11		Douglas Boston II D.B.7
*B/10		Douglas Boston III & Havoc II
B/9	P/74	Douglas B.18a Digby
*B/27	Z/22	Douglas D.C.2 (C-33)
*B/20	Z/19	Douglas D.C.3 (C-47 Dakota)
C/2	Z/24	Douglas D.C.4 (C-54)
*B/10	P/29	Douglas Havoc I
*A/33	P/110	Douglas SBD-3 Dauntless III
*A/33	P/110	Douglas TBD-1 Devastator I
A/61	P/133	Fairchild Argus I (C.61)
A/13		GrummanTBF-1 Avenger
A/57	P/128	Grumman F2F-1
A/40	P/97	Grumman Goose (OA-19)
A/40	P/97	Grumman Gosling I (J4F-1)
A/43	P/113	Grumman J2F-4
*A/17	P/11	Grumman Martlet I
A/15	P/117	Grumman Skyrocket
A/46	P/95	Lockheed 12 (C-40)
B/11		Lockheed Hudson II
*B/36		Lockheed Hudson V
*A/71	P/122	Lockheed 322-61 Lightning
*B/23	P/134	Lockheed-Vega Ventura I
*B/36	P/37	Martin Baltimore I
*B/43	Z/13	Martin B-26B Marauder
C/2	Z/15	Martin PBM-3 Mariner III
B/14		Martin Maryland II
A/8		North American Harvard I
A/64	P/9	North American Harvard II
*B/23	Z/17	North American B-25C Mitchell III
*A/86	P/38	North American Mustang I
A/51	P/106	North American O-47B
A/59	P/131	North American N.A. 50
A/79	P/3	North American Yale I
A/79	P/1	Northrop N-3PB
A/55		Northrop 8a Nomad I
A/51	P/116	Piper L-59a Patrol
*A/86	P/33	Republic Lancer
A/42	P/114	Republic P-47B Thunderbolt
A/9		Ryan STM-S2
A/63	P/129	Seversky P.35
A/49	P/112	Taylorcraft L-57a
*A/71	P/35	Vought-Sikorsky Chesapeake
A/38	P/109	Vought-Sikorsky F4U-1 Corsair I
A/70	P/108	Vought-Sikorsky OS2U-3 Kingfisher
A/48	P/121	Vultee L-56 Sentinel
*A/19	P/26	Vultee Vanguard
A/42	P/101	Vultee Vengeance I
A/44	P/102	Vultee Vigilant I (O-49)
Z/26	Special	Large Size Photo Fortress II and Commando

● ITALY

Plan	Photo	
A/106	P/143	Ansaldo S.V.A.
A/5		Breda 65
A/126		Breda 88 Lince
B/5	P/55	Cant Z501
B/5		Cant Z506B
B/40	P/17	Cant Z1007 Alcione
B/33	P/41	Caproni Ca 133
B/33	P/2	Caproni Ca 135 bis
B/18	P/56	Caproni Ca 310 Libeccio
B/32	P/2	Caproni Ca 311 bis
B/32	P/5	Caproni Ca 312 bis
A/47	P/94	Caproni Ca 313
A/78	P/1	Caproni-Reggiane Re 2000 Falco I
A/52	P/100	Caproni-Reggiane Re 2001 Falco II
B/30	P/94	Fiat R.S. 14
B/7		Fiat B.R. 20 Cicogna
A/4	P/76	Fiat C.R. 42 Frec.
A/4		Fiat G.50 Falco
A/5		Macchi C 200 Saetta I
A/52	P/104	Macchi C 202 Saetta II
B/40	P/17	Piaggio P 32 bis
C/3	P/93	Piaggio P 108B
B/4		Savoia-Marchetti, S.M.79
B/4	P/55	Savoia-Marchetti, S.M.79B
B/41		Savoia-Marchetti, S.M.81
B/41	P/12	Savoia-Marchetti, S.M.82
B/27	P/93	Savoia-Marchetti, S.M.94

● CANADA

Plan	Photo	
A/54	P/40	de Havilland 82C Tiger Moth
A/25		Fairchild M-62
A/66	P/27	Fleet Finch
A/66	P/27	Fleet Fort I
A/25	P/25	Noorduyn Norseman

ALL ORDERS SHOULD QUOTE CODE LETTER AND NUMBERS WITH PLAN AND PHOTOGRAPH REQUIREMENTS LISTED SEPARATELY.

for Solid Models

AUSTRALIA

Plan	Photo	
A/65	P/25	Commonwealth Wirraway
A/65	P/8	de Havilland 94 Moth Minor

POLAND

B/9	P/64	P.Z.L Los
A/7	P/88	P.Z.L Mewa
A/10	P/58	P.Z.L P.24
A/7	P/54	P.Z.L Sum

GREECE

A/23	P/24	Hawker Horsley

BELGIUM

A/3		Fairey Firefly II
A/3		Fairey Fox VI

NETHERLANDS EAST INDIES

A/43	P/111	Curtis Wright C.W. 21B
A/39	P/100	Fokker C-11-W
A/39	P/105	Fokker D-21
A/126		Fokker G-1
B/26	Z/10	Fokker T-4
B/26	Z/9	Fokker T-5
B/7		Fokker T-8-W
A/123		Fokker D.23
A/6		Koolhoven FK.52
A/6		Koolhoven FK.58
A/46	P/103	Lockheed 212a
B/28	Z/11	Martin 139
B/28	Z/16	Martin 166

JUGO-SLAVIA

A/24	P/7	Hawker Fury (Jugo-Slav)
A/24		Ikarus IK-2

IRAQ

A/26	P/35	de Havilland 84a Dragon
A/23	P/39	Hawker Nisr

U.S.S.R.

B/25	Z/6	DB-3 & 3F (ZKB-26)
A/11	P/30	1-15 Chato
A/11	P/7	1-16 Rata
A/12	P/33	1-17
A/41	P/92	1-26 (Yak-1)
A/45	P/99	1-61 MIG-3)
A/35	P/103	IL-2C (Stormovik)
B/25	Z/21	PE-2
B/24	P/135	MBR-2
A/12	P/31	R-10
B/17	P/22	SB-2 Katiuska
B/24	Z/29	SB-RK
A/45	P/115	SU-2BB-1
C/9	P/13	TB-3
A/41	P/92	Yak-4 (BB-22)

JAPAN

A/34	P/95	Kawasaki KB-97
B/20	P/90	Mitsubishi KB-96-1 Otori
B/21	Z/3	Mitsubishi OB-96-4a
A/10		Mitsubishi Karigane II
A/37	P/96	Mitsubishi KB-86-Karigane 11M
B/21	Z/12	Mitsubishi OB-97
A/37	P/89	Mitsubishi S-00
A/34	P/99	Nakajima G-96
A/36	P/89	Nakajima S-96-2
A/36	P/96	Nakajima S-97

FRANCE

A/102	P/149	Breuguet 14 A-2
A/133		Breguet 690-1
A/62	P/130	Bloch 151
A/59	P/126	Dewoitine D.510
A/8	P/56	Dewoitine D.520
B/17	P/9	Loire et Olivier 45-B-4
A/121	P/180	Maurice Farman Longhorn
A/101	P/137	Maurice Farman Shorthorn
A/29		Morane-Saulnier MS 406 C
A/94	P/145	Nieuport 17 C-1
A/94		Nieuport 28 C-1
A/112	P/157	Nieuport 2 Seater
A/133		Potez 63
A/78		Potez 63-II
A/92	P/150	Spad S.VII
A/115		Spad 112

GERMANY

B/45		A.E.G. G105
A/107	P/153	Albatross C.III
A/107		Albatross D.1
A/109	P/153	Albatross D.III
*A/76	P/34	Arado Ar 95-See
A/76	P/6	Arado Ar 96B
*A/74	P/4	Arado Ar 196
B/2		Blohm & Voss Ha 139
B/42	P/31	Blohm & Voss Ha 140
*B/22	Z/7	Blohm & Voss Bv 141B
*C/4	P/4	Blohm & Voss Bv 142
*A/50	P/98	Bucker Bu 181 Bestmann
A/20	P/119	Bucker Bu 133 Jungmeister
A/18	P/59	Bucker Bu Jungmann
A/105	P/143	D.F.W. Aviatik C.V.
*B/1		Dornier Do 17P
B/38	P/13	Dornier Do 17Z
B/1	P/76	Dornier Do 18K
B/3		Dornier Do 24
*C/5	P/22	Dornier Do 26K
*B/31	P/84	Dornier Do 215
*B/22	Z/8	Dornier Do 217E
*A/21	P/39	Fieseler Fi 156 Storch
A/21	P/24	Fieseler Fi 167
A/129	P/188	Focke-Wulf Fw 56 Stosser
B/3		Focke-Wulf Fw 58 Weihe
A/58	P/34	Focke-Wulf Fw 187
A/58	P/26	Focke-Wulf Fw 189
*A/85	P/107	Focke-Wulf Fw 190 A3
*C/8		Focke-Wulf Fw 200 Condor
*C/9	P/122	Focke-Wulf Fw 200K Kurier
A/88	P/165	Fokker Monoplane
A/97	P/165	Fokker D.VI
A/97	P/142	Fokker D.VII
A/88	P/142	Fokker Dr.I Triplane
B/45		Friedrichshafen G.III
B/47	P/169	Gotha Go.5
A/20	P/119	Gotha GO149
A/96	P/166	Halberstadt D
A/111	P/158	Halberstadt C.L.II
A/96	P/166	Halberstadt C.L.IV
A/108		Hanoverana C.L.III
B/42		Heinkel He 59
A/77	P/19	Heinkel He 60
A/60	P/129	Heinkel He 112
A/18	P/88	Heinkel He 113
A/77	P/6	Heinkel He 114
A/14		Heinkel He 115
*B/13		Heinkel He 111K Mk. Va
*B/29	Z/25	Heinkel He 111 HaE
B/123	P/181	Henschel Hs 123
A/80	P/70	Henschel Hs 126
A/115	P/172	Junkers J.1
*B/2	P/47	Junkers Ju 52/3M
B/18		Junkers Ju 86K
*A/14	P/87	Junkers Ju 87B
*B/12		Junkers Ju 88 A-1
*B/29	Z/20	Junkers Ju 88 A-6
C/4		Junkers Ju 90
A/102		L.V.G. C.V.
A/111		L.V.G. D.IX
*A/50	P/105	Messerschmitt Me 108B
*A/80	P/82	Messerschmitt Me 109E
*A/74		Messerschmitt Me 109F
*B/12	P/45	Messerschmitt Me 110 C-5
*A/117	P/173	Messerschmitt 210 A-1
A/93		Pfalz D.III
A/93		Pfalz D.XII
A/92		Roland D.II
A/105		Rumpler C.V.

RECENT ADDITIONS TO 1/72nd SCALE PLANS LIST.

GREAT BRITAIN

A/177	Airspeed Envoy II
A/155	Airspeed Oxford IV & V
B/48	Airspeed Horsa I
A/154	Avro Anson V & VI
C/17	Avro Lancaster II
A/176	Avro 543 Baby
A/176	Avro 641 Commodore
A/173	Beardmore Wee-Bee I
A/120	Blackburn Bluebird IV
A/154	Boulton Paul Defiant III
A/158	Bristol Beaufighter X
B/48	Bristol Blenheim V
A/173	Bristol Taxiplane
A/152	British Taylorcraft Auster II
A/156	De H Mosquito II
A/174	De H 37
A/174	De H 71 Tiger Moth
A/180	De H 90 Dragonfly
A/132	Dessouter Mk. I
A/172	Fairey Barracuda
A/171	Fairey Flycatcher
A/171	Fairey Gordon
A/172	Hawker Fury I
A/155	Hawker Hurricane IID
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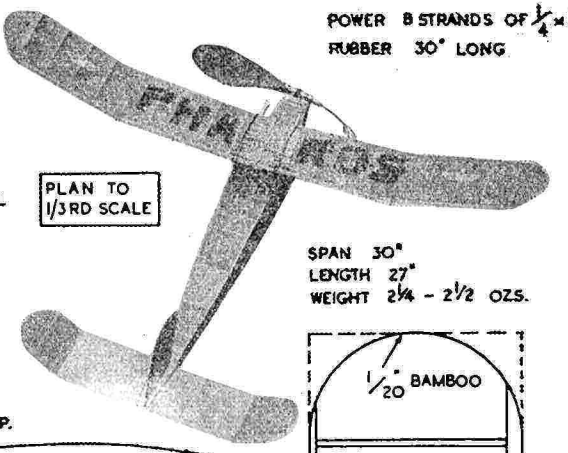

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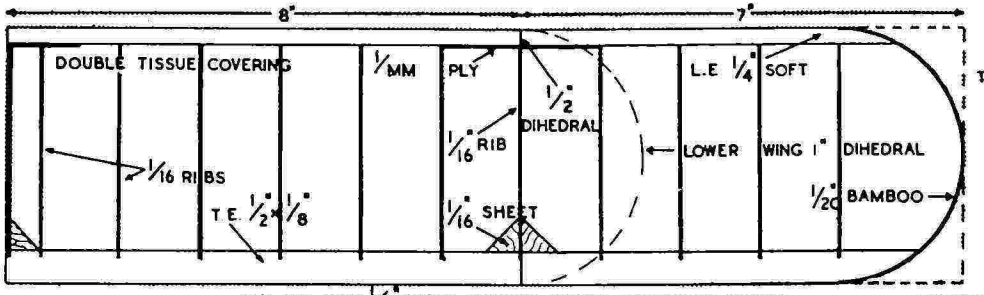

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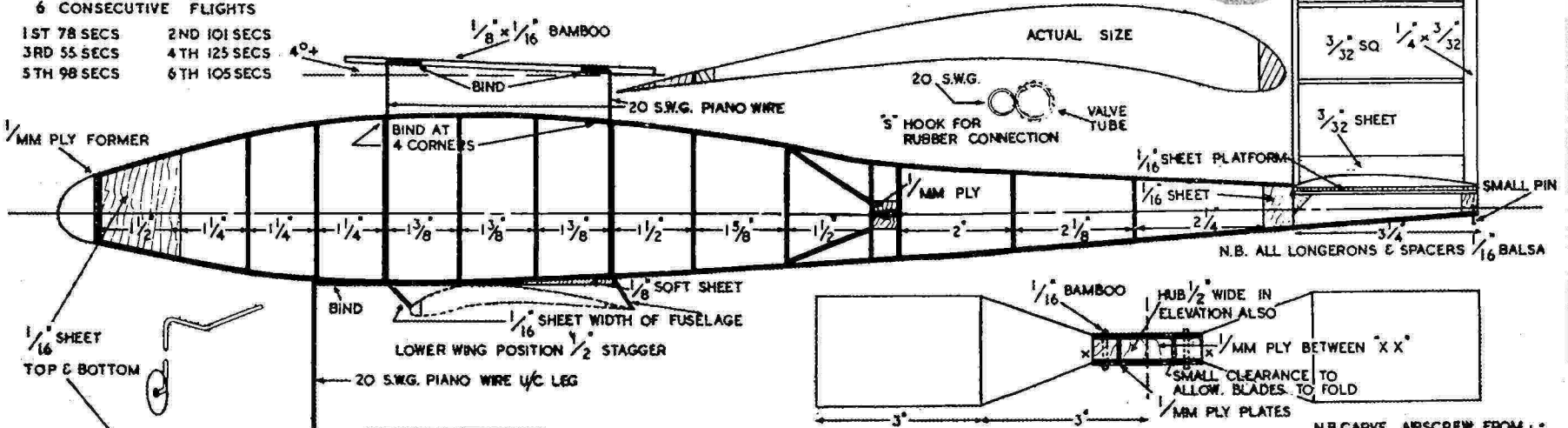

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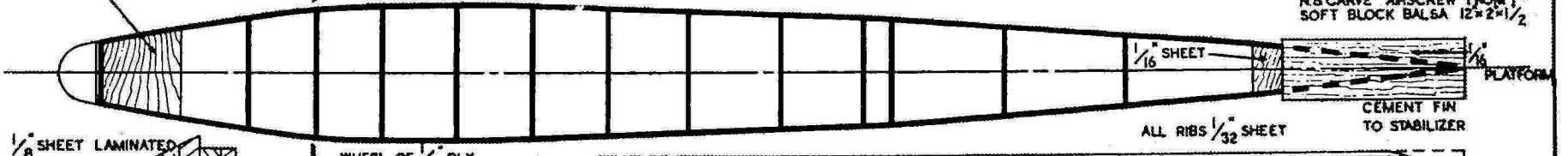
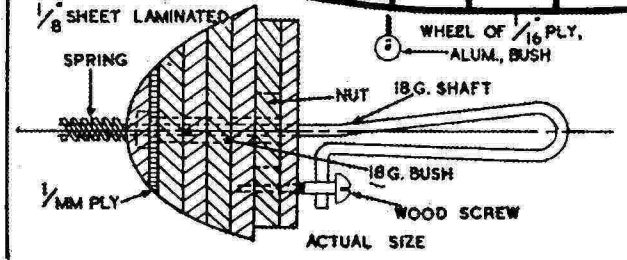
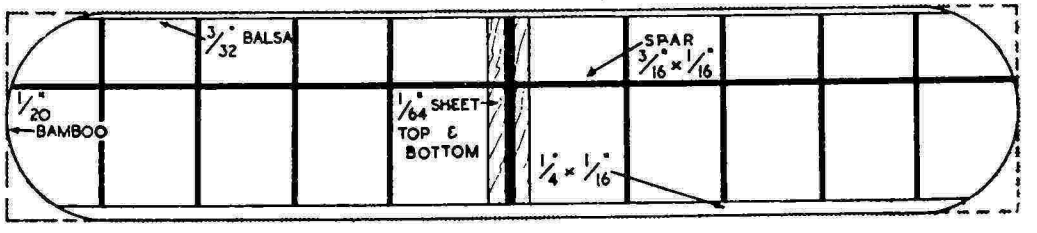






WHAT IS A FLYING SCALE PETROL MODEL?

BY DR · J · F · P · FORSTER

THERE is of course no such thing as a flying scale model, true in every detail both internal and external, whilst, of course, a miniature Merlin engine is impossible. I think we must very soon arrive at a generally agreed definition amongst areomodellers, in order to decide for competition purposes what minimum requisites shall qualify a model for inclusion in this category. Many diehards will insist on the representation of every minute external detail, practically none of which can be seen on a full-size machine flying at 1,000 ft. Such a model is entirely impracticable, as all these details are too prone to damage flying over ordinary grass fields in which the grass alone, if one carries the scale complex to its logical conclusion, is equivalent in length at least to that of a full grown wheat-field. Obviously, therefore, the standard of detail has got to be much more tolerant than in the case of solid or non-flying scale models, and at least half, and preferably more than half, of any points awarded in flying scale competitions, should be for take-off, flying and landing characteristics.

My own view is that in order to make such competitions practical, the outline shape and dimensions of the fuselage and main plane *must* conform as nearly as possible to scale, and in the case of non-retractable undercarriages, these too must represent those of the prototype. Some people might agree to them being placed, say up to 10 per cent. of the fuselage length, further forward than on full size; while I think all do agree that the tail surfaces may be enlarged somewhat; and again 10 per cent. increase in area might easily become an agreed upper limit. Also the size of the prop is governed by the engine used, since reduction gears are almost impracticable. Details such as aerial, pitot tubes, gun sights, aileron hinges or horns, etc., and navigation lights should all be optional excrescences, and if damaged should not penalise the competitor. The problem presented by working retractable undercarts seems to me almost insuperable to any but the most skilled model engineer with workshop facilities, and I think most aeromodellers will agree that it is a pity on this account alone to disqualify from consideration all the multitude of modern low-wing prototypes otherwise quite suitable for scale model reproduction. The question therefore arises what *are* we to do about the undercart?

Are we to ignore it altogether or are we to try and represent the detracted full-size undercart, which is usually very ugly? If we ignore it, we shall immediately see undercarts mounted far up in the nose of the fuselage, which entirely wreck the scale appearance of the machine as a whole both on the ground and in the air. The detracted undercart does not look very pretty in the air if the sheet metal fairings are carried on their inner or outer sides, while adding most undesirable side area low down, and undoing the effects of dihedral on lateral stability. From a purely practical point of view a plain unadorned steel wire looks quite all right mounted in the wing or centre-section of a low-wing model in the air, and is very inconspicuous on the ground, and perhaps the best solution is simply to compromise by enclosing this in an imitation oleo leg, or a streamlined fairing. If an an oleo leg, it looks far better unadorned by sheet metal recess covers, and of course presents less of that undesirable side area. It is surprising how much less unpleasant to the eye is an unfaired single "spindle" undercart mounted properly in the centre-section of a low-wing model in flight, than the much abused "spindly legged" undercart often seen before the war on high-wing cabin machines. Fortunately we could afford to ignore the low side area on most high-wing machines, but it is a real factor in low-wing models.

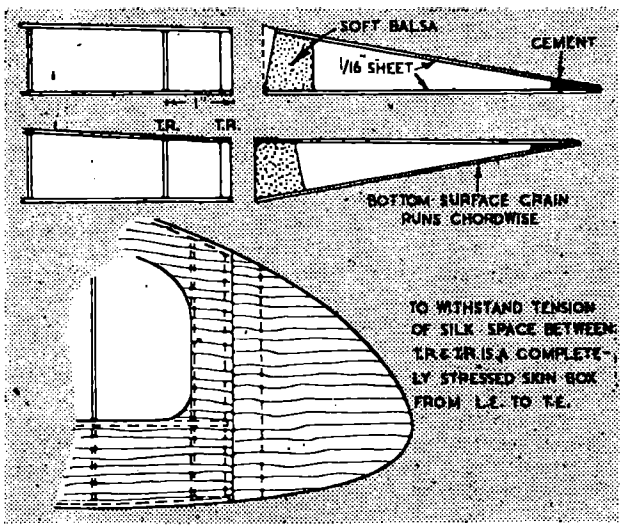
Finally comes the question of dihedral. It seems to me we *must* be sensible and practicable about this. I know that in perfect conditions, it is sometimes possible to fly a high-wing or parasol model with no dihedral at all. I know too, that the less dihedral a model has, the nicer it looks, but it is not much good, in this country at least, having a model which can only be safely flown in the cool of a still evening; these are too few and far between. Fortunately there has at last been a distinct tendency towards increasing dihedral of recent years in full-size practice, and in striving for realism, the scale modeller would do well to choose as his prototype a machine which does incorporate at least *some* dihedral. Increasing an already existing dihedral slightly is not nearly so noticeable as putting dihedral into the model of a machine in which, like for instance the Taylorcraft, it does not exist.

Here let me explode a common fallacy regarding the low-wing model. It has, I think, been very commonly supposed that the low-wing model is sure to require terrific dihedral, since even most parasol machines need quite a lot. Possibly one contributory cause of these big dihedrals on the American freak type of parasol is the gross overpowering encouraged by their "duration-of-glide" competition rules, and most of the dihedral, and often polyhedral, is required to deal with the terrific torque under power, which is largely unnecessary, and indeed inefficient, on the glide. Dihedral only corrects torque at the expense of a high degree of sideslip to port, and for practical purposes such machines climb using the

lift of the port wing only; the starboard wing contributes no lift, and if the circle is tight enough presents actually a negative angle of incidence to the airflow, and may actually contribute depression rather than lift. If sufficient offset is given to the airscrew, the resultant direction of thrust instead of being diagonally to port causing sideslip, can be made as nearly as possible parallel to the C/L of the fuselage, and if a model is correctly adjusted in this respect, there should be only very little banking force to be counteracted by dihedral. Apart from this margin, the dihedral of a model should be the minimum required to correct the ordinary atmospheric inequalities which upset the model's balance as much when gliding (and possibly more because flying slower), as when under power.

Thus it should be clear that the degree of dihedral required is very largely governed by the power used. In this country there seems to be a popular preference for the steady and realistic flying model, whether scale or not; slightly more heavily loaded and with less sensational climb than the American parasol or competition type, and for this sort of flying no great excess of power is needed. The scale model in particular should have this sort of performance, so that here, to begin with, is one reason why the dihedral need not be excessive on scale models of any type.

In the second place the fuselage of a low-wing machine is automatically higher above the C.G. of the machine as a whole than in a high-wing, and if every effort is made to keep the C.G. as low as possible when locating battery, flight timer, coil and undercart, the large side area *above* the C.G. presents a very useful substitute for dihedral, and being more nearly vertical is possibly more efficient in a sideslip than the projected side area presented by the under surface of the dihedralised wing, though this is probably offset by its smaller moment arm from the C.G. On the flying field, the most important is the model's appearance to anyone standing near it, and to a less extent to anyone standing some little distance away—that is to say, the more or less downward view on the model's upper surfaces, and the side or end views. The view from beneath is not so important, and in practice may only occur when the model is in flight and some distance away. The dihedral of the upper surface of the wing is therefore what catches the eye most. If this can be kept within reasonable limits the general effect is good. The lower surface can frequently be made



to present at least another inch more at the tip than the upper surface, by building a wing tapering considerably in thickness, and as nearly all full-size cantilever wings do this in any case, a slight exaggeration of this is quite unnoticeable, and of course incidentally adds greatly to the strength of the wing.

Most petrol model wings seen in this country before the war had tips which suddenly tapered *downwards* from the upper surface to the lower surface. Though a little more difficult to construct when built integral with the wing, it is very much prettier to do the reverse, and to bevel off the *lower* surface to meet the upper, and this has the great practical advantage of presenting quite a steeply dihedralled under-surface at the wing tip where it is most efficient. It is quite invisible when viewed from above or, when in flight, from below, and is only visible from dead ahead. It is pleasing to the eye when it is thus seen. In order to avoid the difficulty of constructing these wing tips, requiring extra temporary ribs to act as jigs over which to lay balsa sheet conforming to the upper camber, I now make my wing tips as separate units, glued to and exactly fitting the end rib, after silk covering and doping the main wing (see examples in accompanying photographs).

The method of construction is very simple (see drawing), and being hollow, they are very light. The lower surface is flat, and consists simply of 1/16 in. balsa sheet, or thinner 3-ply, laid on and cut out to the shape of the plan of the wing tip. A ½ in. thick rib exactly the same foil as the tip rib of the wing is then glued on the straight inner edge. Being careful to retain the extreme inner edge of the camber intact, the cambered upper surface is now bevelled off so that a straight edge can be laid across the upper surface parallel to the wing spar at any point of the chord, sloping down to the curved tip. When this bevel is correct, and allowance made for the thickness of the upper sheet covering, the upper surface is covered by 1/16 in. sheet balsa with the grain running spanwise, so that when cut at its outer edge to the same shape as the flat under surface, and glued to the bevelled upper surface of the rib and all around the curved tip, it conforms to the camber of the wing. When dry, the inner surface of the ½ in. thick rib is then bevelled off against a flat sanding block or sanding wheel until, when applied to the tip rib of the wing, the upper surface is parallel to the upper surface of the wing. In non-scale models by bevelling off a little more still, the extreme tip may be bent up still more if desired, and indeed one or two degrees dihedral even to the upper surface is practically unnoticeable and increases the side area considerably. When this is complete, and the fit is exact, it is covered with silk and doped. When dry the silk is removed from the inner bevelled surface and it is glued to the wing. I have never yet knocked off one of these tips in spite of heavy wing tip crashes, but what could be easier than gluing them on again ?

Probably the most difficult part of a flying scale petrol model for the averagely (ill) equipped aeromodeller is a safe and practical representation of the nose or engine cowling of a prototype. We all know from bitter experience with non-scale models that this is the most vulnerable part of a model, while it contains the most expensive and least easily repaired item in its make-up—the engine. The knock-off engine mounting was of course the obvious and most popular solution of this difficulty in non-scale models, but it is practically impossible to use this successfully with the engine fully cowled as in any known prototype. Using engines up to 10 c.c., the maximum diameter of the backplate of a

knock-off mounting if it *is* to knock off, is from 3–4 in., so that even if some sort of cowling is built up to a backplate, most of the cylinder projects through the cowling and ruins the scale appearance.

There are three ways of dealing with this problem :—

(1) It must be generally agreed by the " Powers-That-Be " that engine cylinders shall be allowed to protrude from cowlings on what are to pass as flying scale models ! ! This seems to me a pretty poor show and is altering the rules of the game to suit the shortcomings of the players.

(2) The engine and cowling must be firm fixtures and built in as part of the fuselage. This is a retrograde step, and was tried in the very earliest flying petrol models, with such disastrous results that for practical purposes it killed the flying scale petrol model at the outset. It is of course easy to build and to represent most faithfully almost any full-size prototype, but both cowling and engine are so liable to serious damage that it simply isn't worth the candle.

(3) An extension prop. shaft must be used, housing the engine within the fuselage. In this way an exact reproduction of the nose and cowling of any known prototype can be made, and the engine is invisible.

The most dangerous method of carrying this out is to have a solid extension shaft attached inflexibly to the engine crankshaft. An additional bearing for this must of course be located in the extreme nose and must be very firmly attached to the actual engine mounting. Owing to our conventional single-bearing crankshafts there is a certain amount of " whip " on the smoothest running engines, with a tendency for the crankshaft bearing to vibrate rapidly up and down and the cylinder to do the same backwards and forwards. With the crankshaft attached firmly to a long extension carried in a firmly fixed bearing, the probable result of this will very soon be an oval crankshaft bearing and the premature wearing out of the engine. This might to a slight extent be mitigated by alternatively mounting the extension shaft bearing in a sponge rubber cushion, but unless the balance of the prop. is absolutely perfect, terrific vibration will occur and in the end probably more damage to the engine will occur than using a fixed forward bearing. Any blow on the prop. will almost inevitably bend the shaft *behind* the bearing if a self-aligning ball race is used, and the shaft here being unsupported must be also absolutely true to avoid whip. Therefore a long bearing or bush for most of its length would seem to be called for, but we are still faced with the possibility of blows on the prop., which will tend to bend the shaft immediately behind it. No doubt slight degrees of bend can be straightened if it is not case hardened at this point, but of course a broken prop. is practically inevitable. Using a long bearing and with a good supply of spare props., this method is not entirely impracticable, but it can be bettered.

It is probably possible to damp the engine whip without wearing the bearing oval, if a flexible steel piano wire extension shaft is used, and carried quite simply in a self-aligning ball race behind the prop. The chief difficulty in this case is attaching or coupling this to the crankshaft, and securing the airscrew driving washer and cutting a thread on its front end. The most thorough sweating and soldering will definitely not stand up to the terrific to-and-fro snatch of a petrol engine between compression and firing strokes, and I notice that the best known published example of this method incorporates a flywheel on the engine which damps out this snatch. Probably some form of sleeve coupling could

be welded to the end of the wire, but in order to get it out of the front ball race for replacement, the airscrew driving washer would have to be detachable and driven by a square filed on the wire. This in turn necessitates the diameter of the front-end being reduced to that of the square, and being piano wire, nothing but a grinder or file will touch it. No wire thicker than 12 gauge could be expected to be sufficiently flexible to save the crankshaft bearing, and a square filed in this diameter wire would in my opinion be too small to stand up to engine snatch. Although I believe he used a flywheel, I should be most interested to know just how the airscrew driving washer was attached to the thin wire extension shaft of Mr. Newman's Mew Gull illustrated on page 150 of Mr. D. A. Russell's book (latest edition).

Thus the only *really practical* method of using the extension prop. shaft principle resulted after a great deal of experiment in my already published detachable or knock-off coupling, and incorporated in its final form in my scale Spitfire II, the copyright of which is now held by the AEROMODELLER Plans Service. For the sake of readers not already conversant with this, I would explain that the actual prop. shaft and propeller are carried in a bearing passing through a solid wooden nose block, just as is usually the case in rubber models. This block is detachable or " knock-off-able ", being held against the front bulkhead by strong rubber bands. The driving dogs are a sliding fit into a special sleeve coupling, attached to the engine crankshaft, and correct alignment is obtained by a projecting locating square on the rear face of the block registering with a corresponding square aperture cut in the front bulkhead. The point of coupling is so arranged that the two shafts are decoupled and clear of one another before any shearing movement can occur during the process of knocking off, and no strain is imparted to the engine crankshaft. The device works extremely well in practice, saves the engine, and nearly always the prop. also, from damage in a crash. The use of it enables the nose and engine cowling of almost any full-size prototype to be reproduced faithfully in miniature.

The word " crash " has occurred several times in this article ! Let us not blind ourselves to the inevitable. Even the very best model, though it never crashes in free flight, may very easily be crashed to a greater or lesser extent by an experienced flyer choosing just the wrong moment to hand-launch on a test glide. I have often seen more damage result from one such *faux pas* than from what seemed a hair-raising shambles in which wings, batteries, and detachable engines went flying in all directions ! Even with a knock-off engine mounting, I have occasionally broken props. when test gliding a nose-light model, which has stalled quite gently 2 or 3 ft. above the deck and " gone in " with or without a nose-over. With a fixed engine or extension shaft a broken prop. is practically inevitable and possibly a bent shaft into the bargain, while the cowling takes it if the prop. escapes.

Readers' . . . . . Letters

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

DEAR SIR,

I am glad that Mr. Cotgrove has said it at last. Model aircraft practice and design can be of the greatest help to full-size flying and should march with it. At present there is little indication that the modellers are in step with anything but themselves.

What possible use are these spidery " duration " planes ? Of what value is a so-called power flight which ends in flopping around on the wings of a thermal current ? Hitting the right thermal is about as much value to aeronautics as roulette to mathematics. Were these currents *scientifically* sought, there would be something in it ; as it stands to-day, it can be nothing more than amusement.

New times are coming. Air transport and popular flying will be one of the great industries of this country after the war. The aeroplane of to-day, light, medium, or heavy, is not as good as it could be, nor as safe as it might be. New ideas are wanted the whole time for advancing flying, and much of this work can be done by the experiments of modellers. For this reason the ingenuity of readers should be diverted from current-bouncing to the carrying of increasing loads over a greater range of speeds than seems possible at present. Such a research will automatically bring about greater safety for the popular flying to come, and produce more efficient transports upon which much of our trade will soon depend.

The best pilot will be a fool at some time or another, and as there can be no invention to prevent the man's own errors, then his machine must be made as nearly foolproof as it can be.

For work designed to solve these problems *all* models should be made to scale and capable of being produced full size. The problems which arise should be dealt with properly, and not by taking the easy way out ; *i.e.*, of bowing to the demands of the model at the expense of the full-size aircraft.

An example of this was recently demonstrated by Colonel Bowden, who designed and built a beautiful scale type low-wing model and then rightly apologises for hanging on to the nose an undercart that no aeroplane could stomach. " It *had* to go forward," he says ; the reason being that his models, like all others at present, fly straight into the ground.

That is the wrong way to treat the problem. Clearly, the fault was that the aircraft flew straight into the ground. That was the point which needed clearing up—and still does. The solution is that an alteration in trim is necessary, and an entirely different approach must be devised, tail down, and at slow safe speed. This approach must begin as soon as the power runs out, and the slow glide must be provided automatically. I consider this problem to be one of the most important of all ; for could it be devised in models (and it will be), it will be fitted to popular light aircraft, and it will *have* to be if the coming private owners are not going to prang with distressing frequency.

That is one example of the way in which modelling should be treated, so that *all* flying will benefit from the ingenious devices of the modellers.

There are all sorts of matters which should engage the attention of the keen-witted. Aircraft performance must be increased, and at the same time, the power necessary decreased. Huge engines are all right for war, where economy does not matter, but they will not bring home the profits in peace.

Another point, too, is that while the full empennage (fin, rudder, stabiliser and elevators) is necessary for control on take-off and landing (in other words, at low speed) not one-tenth of these areas is necessary for cruising flight. These are only matters which occur to me in passing, but there are many others requiring attention. But no one who is anxious for prolonged flights on the wings of the wind, for which any excess weight is thrown overboard, will afford the ounces that these experiments require. Which is why I believe the duration machine will never be of any practical use to the development of future aircraft.

No other industry can be guided and helped by models as the aircraft industry, and the modellers should be in to occupy the place of honour reserved for them But the enthusiast must decide whether he prefers only the prolonged uncontrolled swooping of a model that will never grow up, or the development of his skill and ideas to the benefit of the aircraft of the future.

Hants. FLT. LT. JAY.

DEAR SIR,

I would like to reply to Mr. Cotgrove's letter in the July issue.

I think that he would have a great deal more sympathy with the designers of what he calls " freak aircraft " if he would try to understand what they are after. In the case of a duration model, where length of flight is the only object in view, the designer has to apply his knowledge of the science to that end, and must not allow anything else to come between him and his goal. The result must be unusual to the eyes of anyone who is familiar with full-size aeroplanes, and does not understand the reasons for the differences. In the same way anyone designing a model for general flying, but with a scale look about it, must sacrifice some of the performance to give strength.

The point is that models and full-size aircraft are designed by the same science applied to give different results. I think that anyone who in his youth has designed models with success will, if he enter the aircraft industry in some capacity on the design side, have many advantages, since he will have some slight knowledge of the whole process of designing. I hasten to add that I do NOT say he will be able to design full-size aircraft, as no one can design any size aircraft without experience of something near the same size. I think that this is one way in which model (or for goodness' sake, let's call it miniature and be more accurate), miniature aeronautics can assist the industry. In this connection obviously petrol models, being nearer to the big jobs, can help more.

I think that Mr. Cotgrove both gives miniature aeroplane builders too little credit, and asks too much of them, when he suggests that they could be occupied in solving problems connected with the big machines. Some aircraft firms use models as test pieces, but these are around 1/5 the size of the real thing (I refer to flying models, of course), and as big as many fighters. They have to be, owing to the scale effect, so devices worked out on the sizes of the usual petrol model would not be much help. Thus the ideas would have to be tested again, and the model work repeated, before the results were established, and this is beyond any aeromodeller's pocket.

I think that some good would be done if someone were to start a competition for the longest flight made by a model designed and built by the entrant. This would be quite a change, and if anyone won it he could be sure that the award was due to his own efforts all through.

As for the question of whether duration flying is a great enough end in itself, I think that it may be so, for many people. The man who can fly a model or miniature aeroplane really well has quite a lot of understanding of the way of an aeroplane in the air, though he may not be able to talk about it. This may not be much direct use to the country, although as far as I can see the more people who understand something about aircraft the better chance we will have in getting a start in the scramble for air trade after the war. Do not

Continued on page 42.

TAYLORCRAFT COMPETITION RESULTS

Name.	Time.	Award.
C. J. Ebbrell	**4:15**	**1st Prize.**
T. Smith	**1:55**	**2nd Prize.**
R. Jones	**1:37**	**3rd Prize.**

ADDITIONAL PRIZES

The 22 Prizes of One Year's Subscription to the "AEROMODELLER" have been awarded to the runners-up as follows:

Name.	Time.	Name.	Time
A. B. Somerville	1:21·8	J. A. Cartmel	0:29·5
H. Smith	1:20	L. Watts	0:27·5
P. G. Bentley	1:13	F/O. A. D. Piggott	0:24·5
J. S. Redmore	1:7·4	W. Browell	0:23·5
J. E. Arnould	1:4	J. Warner	0:23
R. Dawes	0:52	S. J. Rogers	0:21·4
D. A. Fidler	0:40	W. Young	0:21
R. W. Morris	0:38	F. Moss	0:20
D. F. Davis	0:34	R. Gallagher	0:20
F. Bland	0:33	A. G. Voss	0:20
E. A. Chattaway	0:30	J. Mowles	0:18·5

SPECIAL DISTRICT PRIZES

No entries were received from Scotland, the remaining three prizes for the best flights in England, Wales and Northern Ireland being distributed as follows:

England .. .. **C. J. Ebbrell**
Northern Ireland .. .. **J. N. Gwynne**
Wales .. .. **K. Emslie**

The excellent flying shot of a flying scale Auster IV forming a background to this page was sent by competitor E. Gregory.

READERS' LETTERS—*continued from page 40.*

forget, however, that the fun of flying a miniature aeroplane is what attracts many of the best designers in the first place, and the desire to beat the other fellow is the spur which leads them to study designing, and improve the breed.

There is yet another point. We are going to see aerodynamics taught in the schools after the war, at some stage of the education of many youngsters, if the indications around these parts can be relied on. What better way of teaching can there be than by intelligent use of small aircraft, to try out the points raised ?

I would suggest to Mr. Cotgrove that he is in some danger of allowing the present outward form of full-size aircraft to become for him the standard pattern, and anything else departing from this he is inclined to label a freak. This mentality is a bar to progress and I am confident that if he looks at full-size aircraft in 15 years' time, and compares them with his present standard, there will be several freaks about, and not models at that.

Ayrshire. ROBERT BURNS.

DEAR SIR,

In the first paragraph of August Club News you mention " imagination."

When I read of models being timed for 36 minutes, 18 minutes and 365 seconds on a *windy* day, I realise I have none of this quality.

My experience, spread over more years than I care to remember, indicates that a model of " Wakefield " size can be kept in sight for 2 to 2½ miles under most favourable weather conditions, provided the coverings are red or other dark colour. This distance is considered " generous " by my experienced Club mates.

With a wind of 8/10 m.p.h (which would be reckoned a " dead calm " by our standards), the distance mentioned would be covered in 12 to 15 minutes.

When we all came up from Bristol to take part in the Wakefields and Nationals at Faireys, and all competitors flew under the same weather conditions (or very nearly so), and the regular S.M.A.E. timekeepers covered all flights, 10 minutes was exceeded on three occasions only (to my knowledge), and then on days when it was possible to take off in any direction one fancied.

We are anxious as anyone to win the Plugge Cup, but unless some kind friend will give us the " gen " on this timing business we are never likely to do so.

Judging from times being returned from the London districts it would seem that they have not had a breath of fresh air since the war started.

I would like to put forward a suggestion by Mr. C. S. Wilkins that if, next year, it is still necessary to hold decentralised comps. the " Gutteridge " should be held late in the year say September, after the crops have been harvested.

Our flying ground is surrounded by cornfields, and it is very disappointing after clocking a couple of minutes to lose a machine in the next field on your first flight, and have the mangled remains returned after discovery by the reaper.

Here's hoping we shall soon be able to come up to town again and bring spare rubber motors with us.

Bristol. R. J. HOWSE.

P.S.—On reading through above, it occurs to me that " imagination " may be the right word after all !

DEAR SIR,

I note with interest a paragraph in your AEROMODELLER concerning a child " spotter," whom you find it difficult to believe in.

It is my baby boy Derek that you refer to. He is 4 years old now, but at the time of going to press was only 3¾ years. At the age of 1¾ years, before he could talk, he could pick out aircraft from a pack of aircraft cards. Our family doctor here in Swindon, and friends and neighbours, can bear me out in this.

He can identify them in the air as well as on paper, also being able to name the different parts of a plane, and if given model parts can place them so as to form the plane.

I give anybody that feels any doubt a hearty invitation to see and hear Derek.

Wilts. EDITH LOCKE.

DEAR SIR,

I am writing to ask your advice on a matter which has puzzled me greatly. I first noticed it a year ago, when two of my larger model aeroplanes began to emanate a peculiar ticking sound, exactly like a loud pocket watch, lasting for about ten seconds and repeating at intervals of about half-a-minute. This continued until September, when it stopped, and I thought no more of it. But now the same thing has occurred again, and has spread to a big glider which has never been near the other 'planes. On opening up the models I could find no trace of insect life. A block of balsa wood appeared to have the same trouble, although I am not quite certain of this, but when I carved an airscrew from it I could find nothing to account for the trouble.

The original models were in a damp garage for a fortnight last July, and I am wondering if this may be something to do with it.

Devon. G. SAXBY.

[*Possibly due to Gremlins coming out of their shells, banging their dinner spoons ! Anybody else had similar experiences ?*—ED.]

DEAR SIR,

In your August issue you published an article entitled " Reminiscences of the D.H. Biplanes of 1917–18."

I do not remember the name of Victor A. Webb, but I happen to have been a pilot in No. 49 Squadron R.F.C. and R.A.F., joining the Squadron on its formation and going overseas with it at the beginning of November, 1917, and leaving it in June, 1918, to take a flight in another Squadron of the same type. It appears to me that to say that the article in question contains some inaccuracies would be putting it mildly !

In the first place the 200 h.p. R.A.F. 3A engine fitted in the D.H.4 was fairly reliable as reliability went in those days. I found that if it ran well during the first half-hour or hour while gaining height, it usually saw the " show " through quite happily. It suffered from overheating sometimes, but with this particular engine I heard of one case only of prop. trouble. The D.H.4 was looped a number of times—I didn't do it myself because I didn't believe, on principle, in doing it with a machine of that type.

The Fiat motor was not a success (*a*) because one had to stand by with fire extinguishers when it was started and it had tendencies of that kind, and (*b*) it was so outstandingly noisy that the " element of surprise " on a bombing raid was non-existent.

The engine which was shed from its bearings in No. 49 Squadron was a BHP (almost similar to the Siddeley Puma) and it did so because the gun synchronising gear went wrong and a blade of the prop. was shot. No engine runs well in these circumstances. This incident occurred when the Squadron had just been re-equipped with D.H.9's and was at Petite Synthe aerodrome, Dunkirk, and the crew were: Pilot-Sgt. Oliver and Observer-Sgt. Kelsall, and date, 22nd April, 1918.

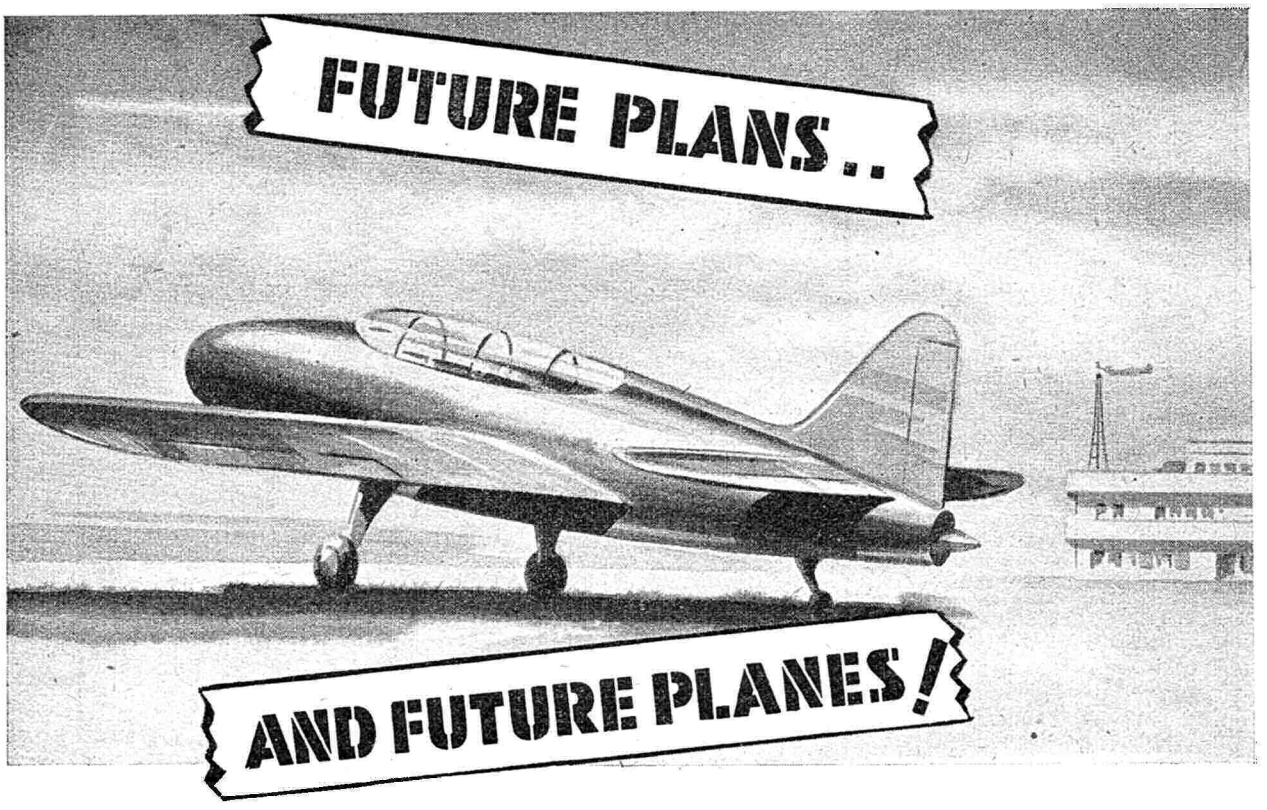
I happen to have a photograph of the actual engine after it was recovered, and I do happen to have kept a diary. The machine came down in a slow spiral and Oliver sustained a broken nose and black eyes and Kelsall who had climbed forward to try and balance things, a broken leg. Oliver was taken prisoner on a later show with Sgt. Davies, an old observer of mine.

I do not remember the effort of 3 AM Smith but I do remember our old Armament Officer, Lt. P. L. Smith, of whom many of us have happy memories and some of us have met several times between the wars.

No. 49 Squadron to my knowledge *never* formed part of the Independent wing. Thus was confirmed for me by one of our observers whom I met again recently.

Altogether I am not very impressed with the article on D.H. biplanes, and as I was keenly interested in flying then, before and since, I have kept quite accurate notes.

Middlesex. A. H. CURTIS.



All in good time! The planes of the future are on the way. The plans are on the drawing boards. But eager aeromodellers must curb their (quite excusable) impatience. The new model kits will be put into production as soon as service demands permit.

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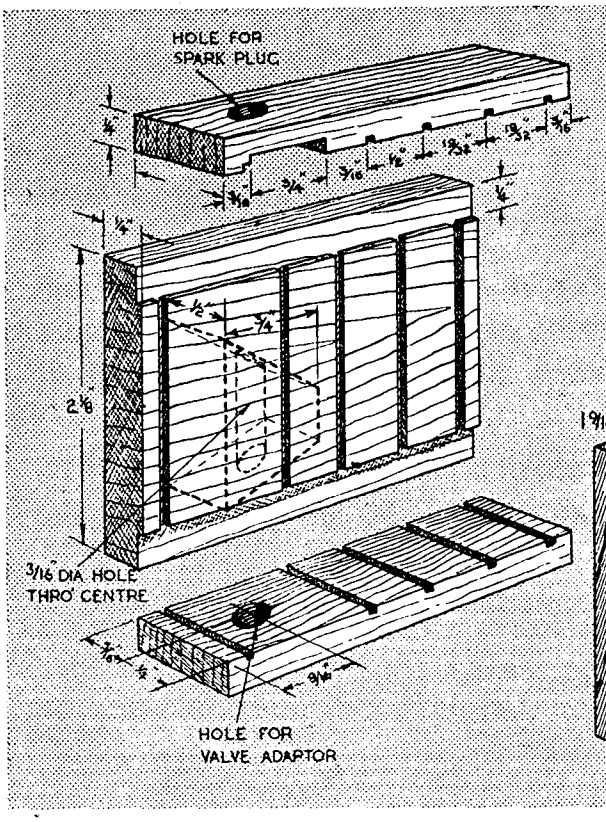

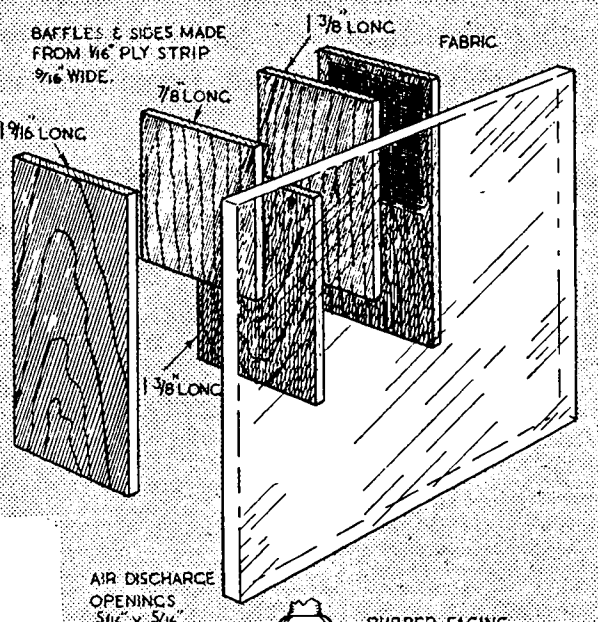

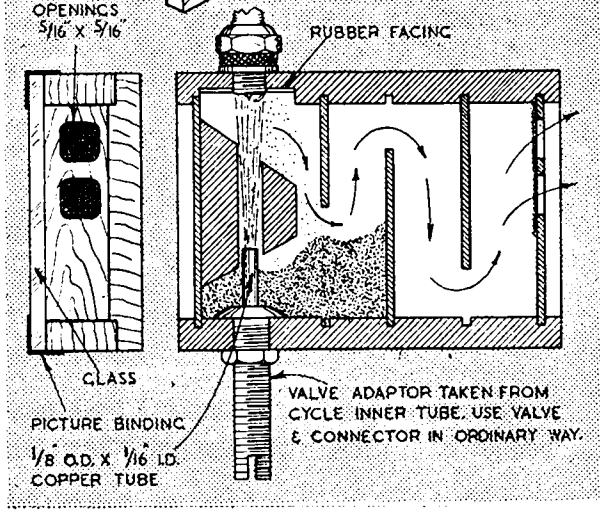

BY RAY RUSHER

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THE cleaner consists essentially of a box having a glass front, baffle walls, an air nozzle and a sand nozzle.

The walls are made of soft or medium pine wood. The vertical grooves are cut to a depth of 1/16 in.; parts of these grooves are not used but are cut as a matter of convenience. The horizontal grooves on the back wall are cut 1/16 in. deep and ¼ in. wide to match the top and bottom wall edges. The three walls are grooved all together before being cut apart.

Spark plug receiving hole is drilled 7/32 in. in diameter for ½ in. spark plugs and 21/64 in. in diameter for ⅝ in. spark plugs. A wide notch is cut across the bottom of the top wall so the wall is left only ⅛ in. thick. The spark plug points then project so you can observe if they are thoroughly clean after operating the cleaner. The bottom of the notch is faced with rubber to prevent sand-blasting the wood away; the rubber may be a piece of inner tube or a tyre patch secured in position with rubber cement.

After spark plug hole is drilled, force a spark plug in to it, rotating the plug at the same time. Be sure to keep the plug square with the top wall, so that an excellent airtight threaded hole is produced.

The hole for the air nozzle is drilled 17/64 in. in diameter and the threaded air nozzle stem is similarly used to thread it.

Leave the valve in the air nozzle to prevent sand from being drawn into the air pump attached to the air nozzle during the pump suction stroke. For supplying compressed air, an ordinary bicycle tyre pump is satisfactory. The hose supplied with it is used for connecting the pump to the air nozzle while the cleaner box is held rigidly in a vice, the jaws contracting the ends of the box (not the front and back, or the glass might be broken).

In the upper end of the valve stem, a piece of copper tubing is soldered to serve as an air discharge nozzle. The hole in it is not greater than 1/16 in. in diameter, when a bicycle pump is used as a source of compressed air. It can be larger if you use a tyre pump or an air line from an air compressor.

The sand nozzle, made of ¾ in. by ½ in. wood, is glued

Continued on page 25.

MONTHLY · MEMORANDA ·

BY O · G · THETFORD

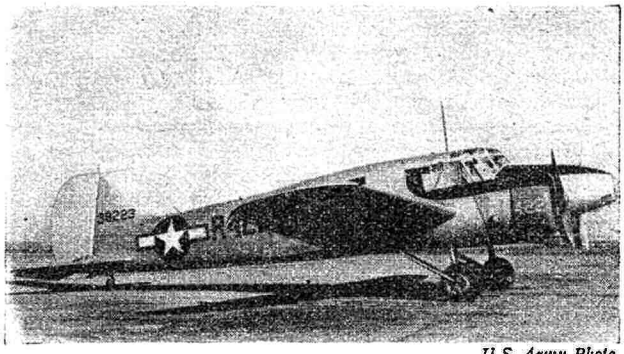
A Boomerang Squadron.

INFORMATION has now been received on the markings of a Commonwealth Boomerang fighter squadron of the Royal Australian Air Force. Boomerangs of this squadron bear the code letters " BF " in grey on the fuselage sides, ahead of the roundels, and a further identification letter aft of the roundel in the same way as British squadrons. The standard blue and white S.E. Asia roundels (with the red centre removed) are painted above and below the wings and on the fuselage. Blue and white stripes, the white foremost, are painted on the fin. An interesting feature of the markings is the retention of the pre-war Australian system of combined unit number and serial number appearing on the rear fuselage. In the peacetime R.A.A.F., the squadron number together with the prefix " A " was painted on the rear fuselage of each machine and was followed, after a hyphen, by the service number of the aircraft. Thus Hawker Demon two-seat fighters of No. 1 Squadron carried the numbers " A1-1," " A1-2," " A1-3," " A1-4," etc., on the rear fuselage. Vickers-Supermarine Seagull amphibians (R.A.F. Walrus) of No. 2 Squadrons were numbered " A2-1," " A2-2," " A2-3," etc. On some types the numbers were repeated beneath the wings, but this practice has now been abandoned. Other Australian squadron numbers seen painted on aircraft include " A4 " (Avro Anson), " A3 " (Commonwealth Wackett elementary trainer), " A16 " (Lockheed Hudson), " A17 " (Tiger Moth), " A19 " (Bristol Beaufighter), " A20 " (Commonwealth Wackett Wirraway), " A24 " (Consolidated Catalina), " A43 " (Avro Anson), and " A52 " (de Havilland Mosquito). The Boomerangs mentioned above carry the numbers " A46 " and presumably belong to No. 46 Squadron. Boomerang " BF-N " is numbered " A46-128 "; " BF-W " is " A46-177 "; and " BF-C " is " A46-178." These numbers appear in grey stencilling just aft of the individual identification letters. Boomerang " A46-177 " has the sides of the fuselage beneath the tailplane painted pale sky like the undersurfaces, and on this particular aircraft the number " 177 " is painted in black against the light colouring, whilst the " A46 " is in grey on the camouflaged portion. All the machines have a light-coloured spinner with the exception of " BF-N."

Exact details of camouflage colouring used in the Pacific theatre are still withheld officially, but they are believed to be similar to that used in the Mediterranean, *i.e.*, dark earth and middle-stone.

The Last Stringbag.

Mention was made in a previous issue to the production of the last Swordfish torpedo biplane for the Fleet Air Arm at the Blackburn factory in August, 1944. Details of this particular machine's markings are now available. Its serial number was NS 204, and this appeared on the rear fuselage beneath the stencilled letters " Royal Navy." The camouflage scheme was dark slate grey and dark sea grey on the upper surfaces of wings, tail and fuselage and the familiar white of Coastal Command on the sides of the fuselage, the under-surfaces and the sides of the vertical tail surfaces.



U.S. Army Photo.

Americanised Anson.

As mentioned previously, the Canadian-built Avro Anson is now serving as an advanced crew trainer in the U.S.A.A.F., under the designation AT-20. The particular type of Anson so employed is a Mk. II and is fitted with two 350 h.p. Jacobs motors. It is produced by Federal Aircraft. In accordance with the latest U.S. practice, the Ansons are finished silver all over and have the U.S. national marking on the fuselage, well aft, above the port wing and beneath the starboard wing. The name " U.S. Army " appears in black letters beneath the wings. One of the American Ansons, with the serial number "38223 " in black on the fin also bears the school number " R 422 " in large black figures just ahead of the fuselage star. The decking aft to the cabin and the top inner surfaces of the motor cowlings are finished in olive drab to lessen the glare.

Grouped Squadron Letters.

The introduction of the invasion stripes has resulted in the re-positioning of squadron letters on many British aircraft. One of the main types affected is the Bristol Beaufighter. The majority of Beaufighters now carry the code lettering amidships, just ahead of the rear cockpit. The three letters are grouped together, the third letter being spaced a short distance away from the two squadron letters.

An Australian Beaufighter squadron operating with Coastal Command, R.A.F., carries the squadron letters " UB " in the new location, the complete markings being " UB-A," " UB-B" " UB-C," " UB-D," etc., the individual letter being foremost. These Beaufighters carry eight rocket-projectiles beneath each wing and the black and white invasion stripes appear on the wings and encircle the rear fuselage. Standard fighter camouflage is carried, *i.e.*, dark green and dark sea grey on the upper surfaces and medium sea grey on the under-surfaces.

Stirling Tugs.

Since D day, the Short Stirling has once again come into the picture, following a long period of silence as to its activities. It is now mainly employed as a glider-tug, together with the Lancasters and Halifaxes, and this particular version is known as the Stirling IV. The Stirling IV is generally similar to previous versions used for heavy bombing, but has the defensive gun turrets deleted.

Stirlings were widely used to tow Airspeed Horsa gliders on the recent Arnhem airborne operation. One of the squadrons engaged on these duties carries the code lettering " QS," in unusually small letters, exactly one-half the size of the individual machine recognition letter

which appears full size. The three letters appear together ahead of the fuselage roundel, the individual machine letter being between the roundel and the squadron letters on both sides of the fuselage. Black and white invasion stripes encircle the rear fuselage, but for some reason the stripes did not appear in the usual wing location. These Stirlings were painted black underneath and on the fuselage sides and were camouflaged in green and earth on the upper sides. Standard roundels and fin flash were carried.

Spit Fourteen Squadrons.

Many squadrons are now fully equipped with the new Spitfire Mk. XIV with the five-blade airscrew and details of the markings of two of them can be mentioned. One of the first squadrons to be equipped with the type displayed the code letters " VL " on their machines, ahead of the roundel, and had standard fighter camouflage. Another squadron is coded " DW " and readers may remember these letters on Mk. II Spitfires early in the war. Spitfire XIV serial number RS 159 bears the letters " DW-D " and RS 167 is lettered " DW-E." Standard fighter camouflage is carried.

New R.A.F. Marks.

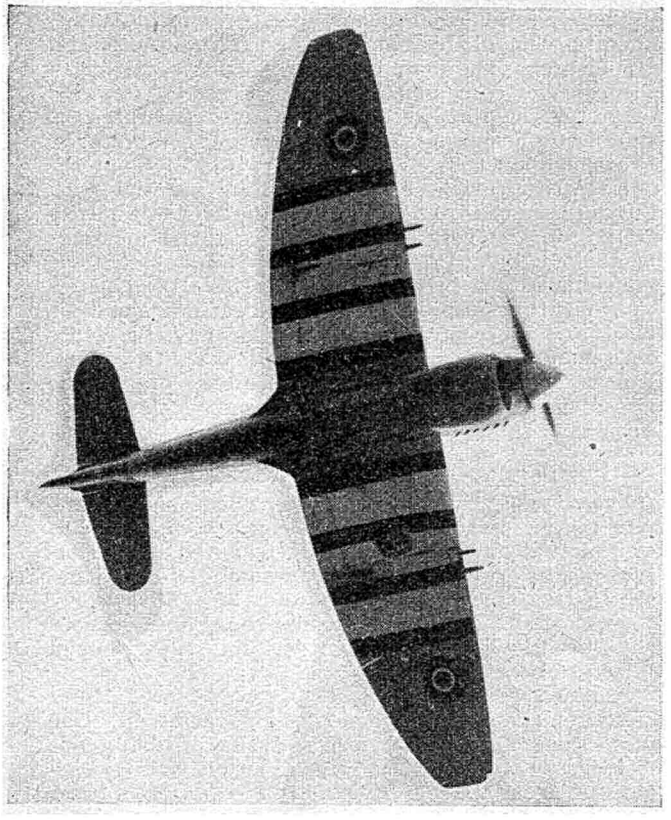
The Mark numbers of several types of aircraft serving with the R.A.F. have recently been released for publication. The British version of the North American B-25J Mitchell is known as the Mitchell III. The Vultee Vengeance III dive-bomber of the R.A.F. (some of which have flown in this country camouflaged in dark green and dark sea grey) is the equivalent of the U.S.A.A.F. A-31C attack-bomber, whilst the British Vengeance IV is the same as the U.S. A-35B.

Amongst British-built types, mention has been made of the Wellington X and XI, the latter being the Coastal Command oversea reconnaissance version of the Mk. X. The Mk. X Wimpy is essentially similar to the Mk. III, but has the later Hercules XVI of 1,650 h.p. The re-engined Beaufighter with the same power plant as the Wellington X is known as the Beaufighter VI, but is otherwise similar to the Beaufighter I. The current version of the Fairey Barracuda is now known to be the Mk. II. The Mk. I had the Merlin XXX motor driving a three-blade airscrew.

R.A.F. Flashbacks.

Many letters reach these offices requesting information on the markings of Royal Air Force aeroplanes of ten or fifteen years ago, in the days when silver dope and brightly-coloured squadron markings reigned supreme. In order to meet this demand, it is hoped to include one photograph of such types in " Photonews " each month. together with a few accompanying notes in this column, The 1930 fighter biplane J 8959 illustrated in the October issue was an Armstrong-Whitworth Siskin of No. 43 Fighter Squadron, R.A.F. The squadron markings, consisting of black and white checks on the wings and fuselage, are well illustrated. The checks on the fin indicate that this particular machine was flown by the squadron commander.

This month, one of the famous Hawker Hart light day-bomber squadrons is illustrated. These Harts of No. 57 (Bomber) Squadron, together with those of Nos. 12, 18 and 33 Squadrons, were a familiar sight at R.A.F. displays at Hendon in the early 'thirties. They were doped silver all over and carried the squadron number in the flight colour (red, blue or yellow) just beneath the gunner's cockpit. Large-diameter red, white and blue roundels, overlapping the ailerons, appeared on the wings. The serial number was in black on the rear fuselage and beneath the lower wings (as on current trainers). Red, white and blue stripes were painted on the rudder, the red foremost. Harts of Nos. 12, 18 and 33 Squadrons were similarly marked. Five Harts of No. 57 Squadron were numbered K 2458, K 2465, K 2467, K 3025 and K 3032.



On the left is a picture of the Hawker Tempest V. A g.a. drawing and description will appear in the next issue of the AEROMODELLER.
(British Official Photograph.)

Below is shown the first British jet-propelled aircraft, built by the Gloster Aircraft Co. Developments of this type are now in service with the R.A.F.
(British Official Photograph.)

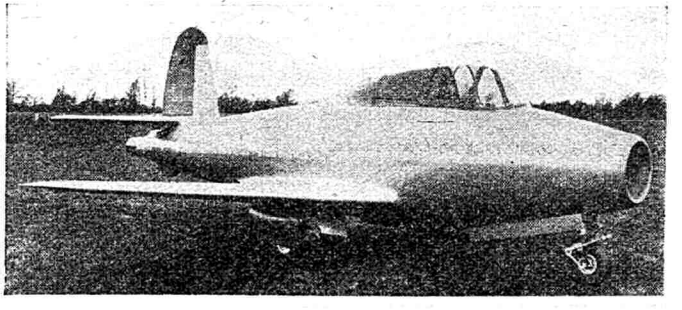
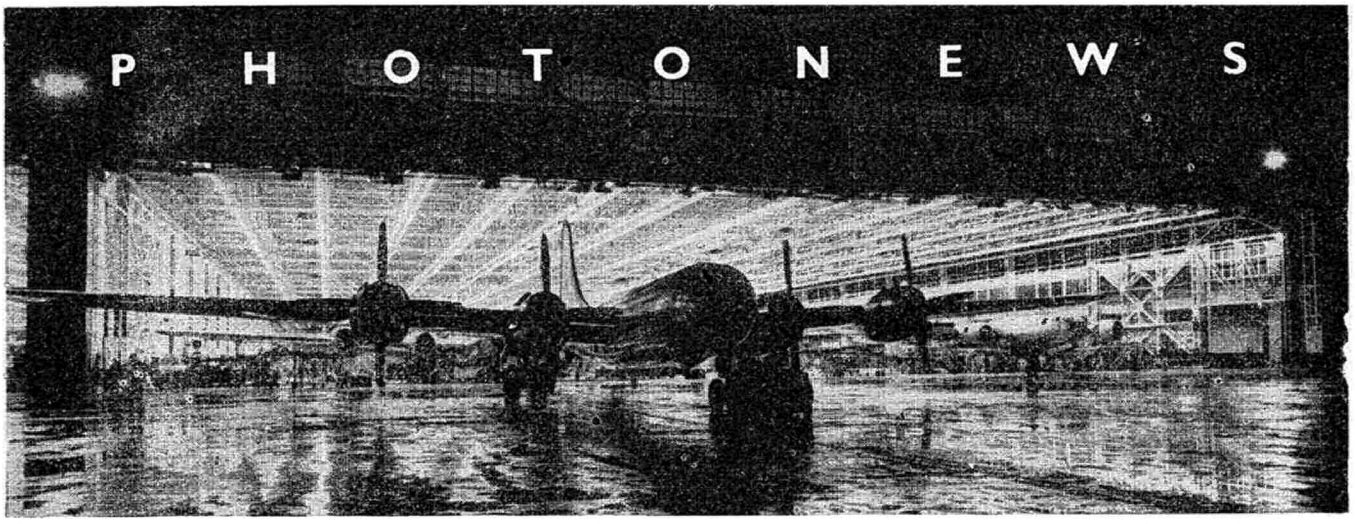
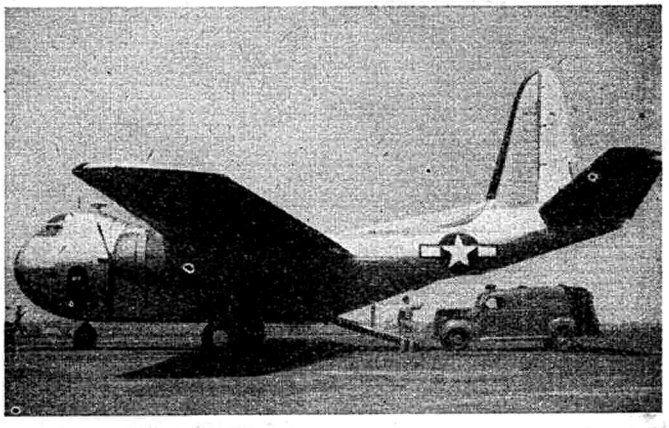


PHOTO NEWS





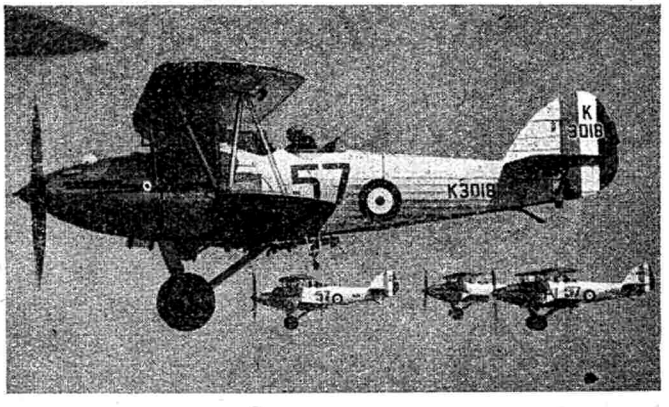
The heading photograph this month is an impressive shot of Boeing Superfortresses coming off the production line at the Wichita plant.
(Photo: Boeing.)

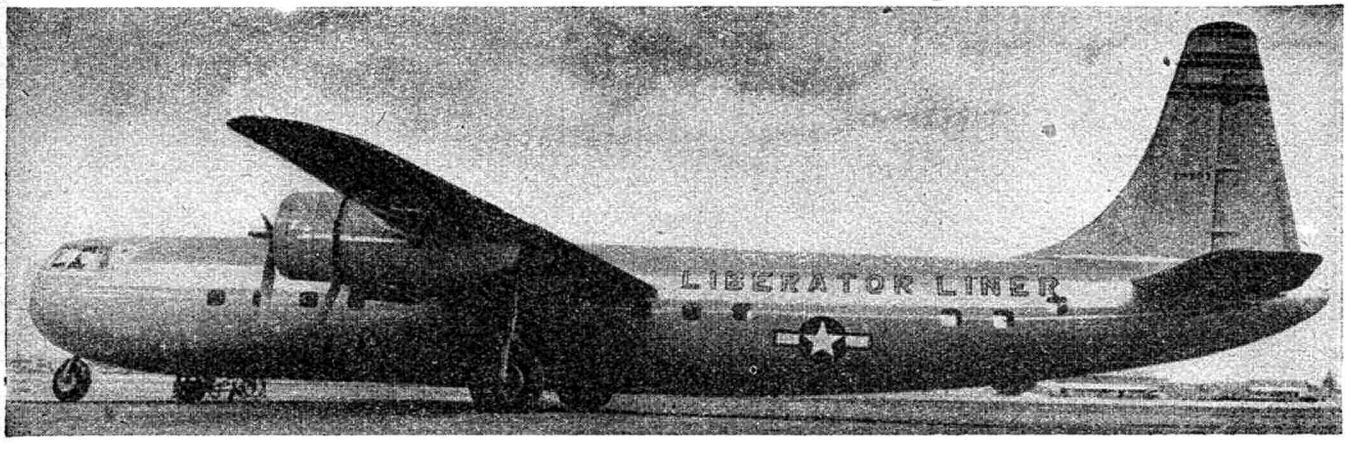
Immediately above is a new shot of the B-26 Marauder. This version is believed to be the B-26H. *("Marlin" photo.)*

Of unusual appearance is the Conestoga (above right), designed by the Edward G. Budd Manufacturing Co. of Philadelphia. At first ordered in quantity, it is no longer to be produced. *(Photo: Rudy Arnold.)*

On the right is an old timer, the Hawker Hart, once the most popular of the R.A.F.'s two-seat day bombers. Those shown are of No. 57 (B) Squadron.
(Photo: P.N.A.)

Below is the new commercial version of the B-24 Bomber, known as the Liberator Liner. The wings are the same as the B-24's, but the fuselage and tail-unit have been re-designed.
(Photo by Consolidated Vultee through Michael Lorant.)





AEROPLANES DESCRIBED XXII

THE BOEING P-26A

BY H · J · COOPER

NEXT MONTH :
The Hawker Tempest V

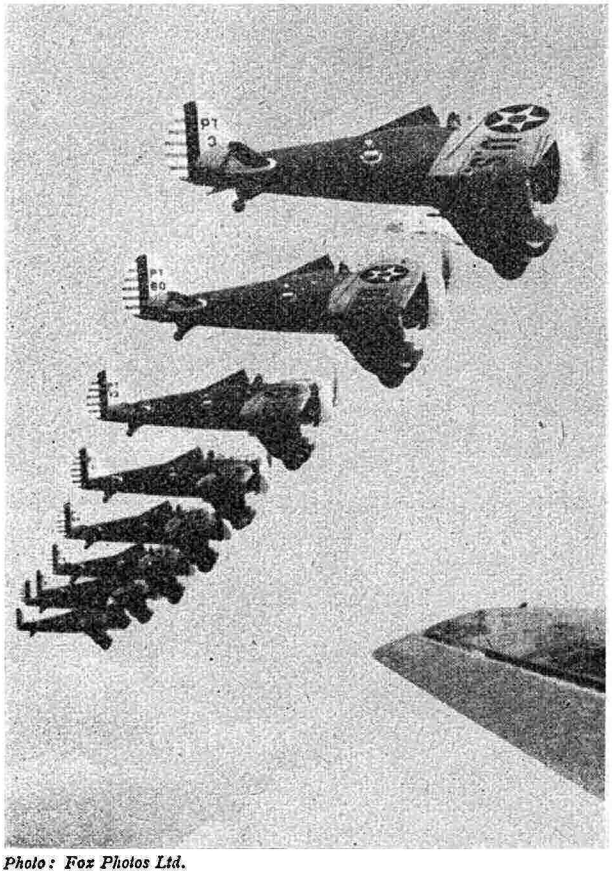


Photo : Fox Photos Ltd.

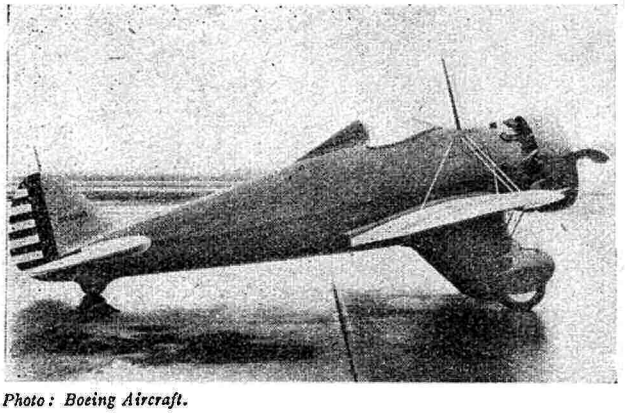


Photo : Boeing Aircraft.

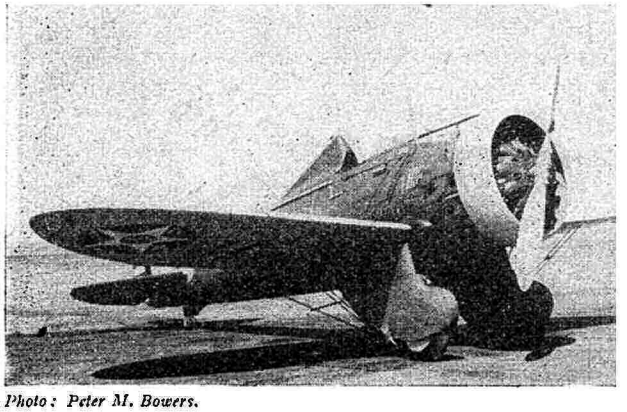


Photo : Peter M. Bowers.

THE Boeing P–26 single-seat fighter monoplane appeared first in 1933 and was then known as the XP 936. The type went into production for the U.S. Army during the next year, when 111 were built, and was delivered to the 34th, 73rd and 95th Pursuit Squadrons, which were then flying the P–12E biplane, also designed by Boeing.

The P–26 was fitted with a 500 h.p. Pratt & Whitney Wasp SR–1340–G nine-cylinder air-cooled radial motor, and attained a maximum speed of 220 m.p.h. The landing speed is about 50 m.p.h., which is rather lower than the appearance of the P–26 with its fat fuselage and sharply-tapered wing-tips might suggest A two-bladed metal airscrew was fitted.

The next version, known as the P–26A, had a slightly modified form of undercarriage, and was equipped with a 600 h.p. Wasp R–1340–27 motor. This version is shown in the accompanying drawing.

The P–26B was similar to the 26A, but was fitted with a fuel injection system.

The wings of the P–26 are of all-metal construction and are covered with a metal stressed skin, including the ailerons. Handley-Page automatic slots are fitted to the leading edge. The tail unit is an all-metal cantilever structure covered on all surfaces with a metal skin. The fuselage is a metal monocoque.

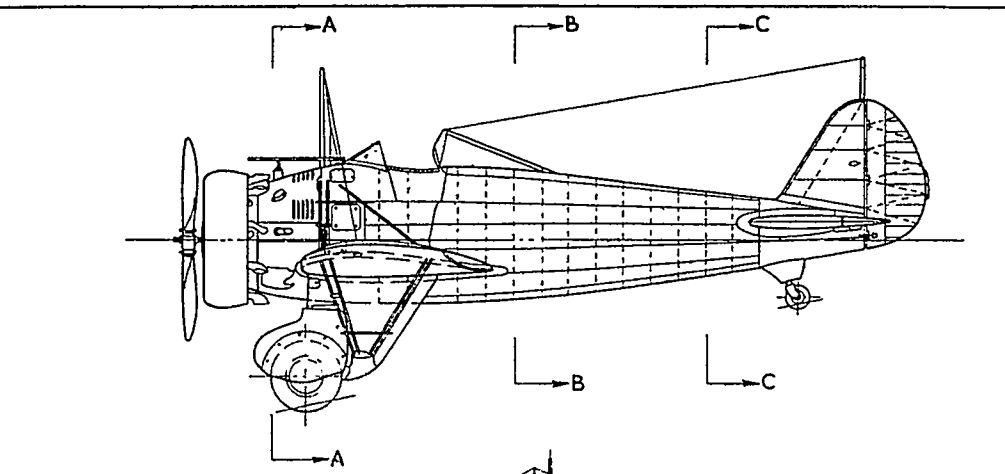
Armament of the P–26 usually consisted of two ·30 machine-guns mounted in the fuselage which fired forward between the cylinders of the motor. On some versions one ·30 gun was replaced by a ·50.

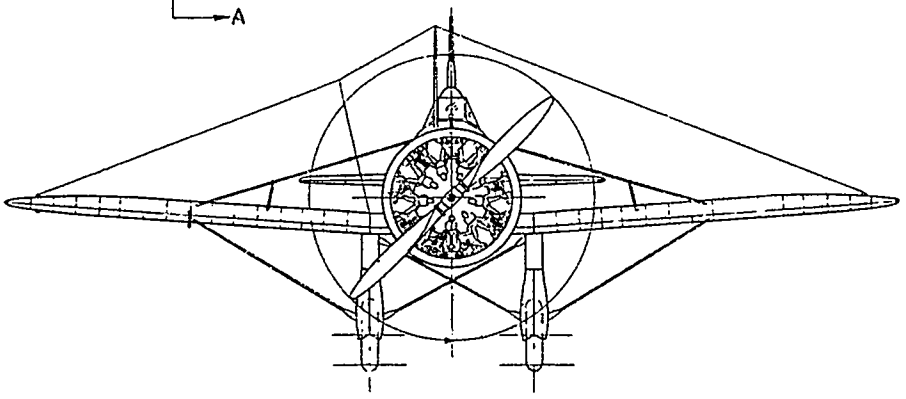
The P–26A had a maximum speed of 232 m.p.h. and an operating speed of 210. The range was 386 miles at operating speed.

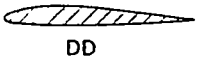
Original P–26s were coloured with olive drab fuselage and undercarriage legs, which were later changed to blue. The wings and tail-unit were yellow, with the words "U.S. ARMY" painted in black underneath the wings, their tops being towards the leading edge. The five-pointed white star on a blue disc with a red spot in the centre was carried above and below the wing-tips, but not on the fuselage. The rudder bore a vertical blue stripe with alternate red and white bands.

Although the P–26A, as the last open-cockpit, fixed-undercarriage pursuit ship (fighter aircraft) of the U.S. Army has now been relegated for training, a number were used operationally against the Japanese in the Philippines.

Main dimensions of the P–26A are as under: Span, 27 ft. 11⅝ ins.; chord, 6 ft.; length, 23 ft. 7¼ ins.; tailplane span, 9 ft. 8 ins.; tailplane chord, 2 ft. 9½ ins.; elevator chord, 1 ft. 4⅞ ins.; track, 5 ft. 1½ ins.; rudder height, 4 ft. 8¾ ins.; airscrew diameter, 8 ft. 9 ins.; dihedral, 4 degrees.







BOEING P-26A.

FT.

CLUB NEWS

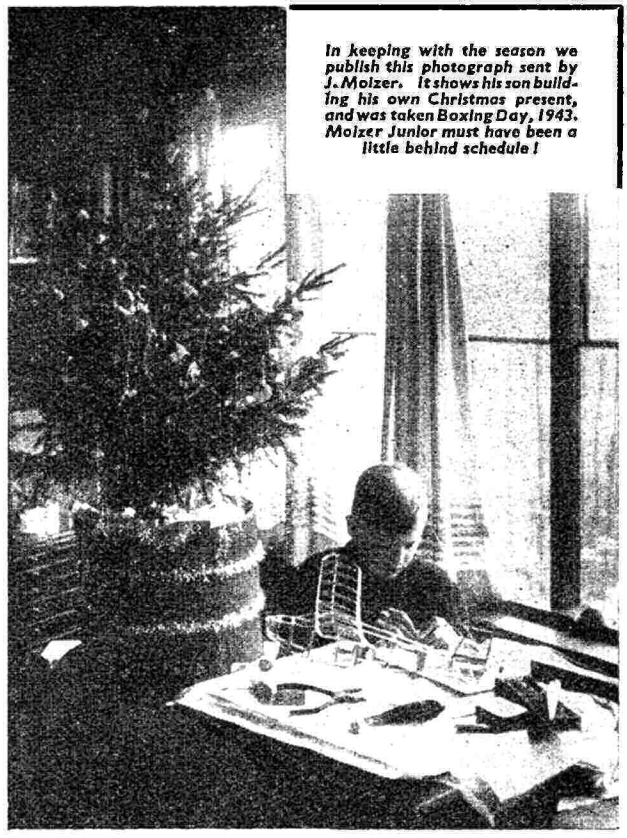
BY CLUBMAN

I HAVE had many enquiries lately regarding my attitude to the S.M.A.E. and the recently formed A.B.A., and feel it is time I put on record that as " Clubman " I am—and intend to remain—entirely unbiased in favour of either body. In my opinion, there is room for both organisations, and while this view may not meet with approval in some directions, I would point out the greatly increased activity of the S.M.A.E. as a direct result of the newly introduced " competition."

It is my studied opinion that a " closed corporation " tends to grow stale as a result of lack of competition, and I am delighted to note the way things have started to move in the S.M.A.E. during the past few weeks. Many items that affiliated clubs have been clamouring for for months are now putting in an appearance, and it would appear that matters of current interest are now being attended to instead of being referred back as in the past. Truly—as they say in the R.A.F.—the Society has commenced to " withdraw the irremovable digit."

One thing I would ask, however, and that is that special attention be given to the matter of properly controlled and conducted petrol model flying. I know this is an old cry of mine, but I still maintain that as matters stand at the moment there is far too much scope for indiscriminate flying of these models, and if something is not done very soon to tighten up control as far as possible, trouble can only result as the outcome of the terrific increase in such flying after the war. Now, while activities are still at low ebb, is the opportunity to get everything cut and dried in order to cope with the expected spate of petrol models that is sure to come.

I am pleased to note the efficient way in which the Northern Area clubs have got cracking, their monthly news bulletin showing that they are certainly not letting the grass grow under their undercarts. Various proposals for contest improvements are to be made to the S.M.A.E., two in particular being very worth while. They are that contestants should build their own machines, and that only one model be allowed to each entrant in a competition. I was always under the impression that these requirements were the recognised thing, but apparently they are not, and should be regularised at the earliest opportunity.



In keeping with the season we publish this photograph sent by J. Molzer. It shows his son building his own Christmas present, and was taken Boxing Day, 1943. Molzer Junior must have been a little behind schedule!

LONDON DISTRICT INTER-CLUB CHALLENGE CUP

(3rd Round)

		(1)	(2)	(3)	Total
BUSHEY PARK.					
Glider— A. M. Wright ...	...	66·2	81·8	251·0	399·0
R. Dawkins ...	...	34·4	57·0	7·0	98·4
Rubber—A. H. Taylor ...	...	45·0	79·4	88·0	212·4
A. M. Wright ...		93·0	56·0	91·8	240·8
					950·6
WALTHAMSTOW.					
Glider— R. Slaughter ...	...	20·8	24·2	86·8	131·8
C. Mayes ...	...	203·0	131·5	137·0	471·5
Rubber—E. Aylward ...	...	53·4	46·8	34·5	134·7
F. Deudney ...	...	54·8	57·1	136·3	248·2
					986·2
FINALS					
NORTHERN HEIGHTS.					
Glider— R. Teasle ...	...	143·0	180·0	68·0	391·0
J. S. Davall ...	...	105·8	83·2	103·4	292·4
Rubber—F. E. Wilson ...	...	141·8	124·8	125·3	391·9
R. Copland ...	...	85·5	88·5	84·0	258·0
					1333·3
WALTHAMSTOW.					
Glider— R. Slaughter ...	...	104·2	132·0	216·5	452·7
B. Alder ...	...	78·5	109·2	137·0	324·7
Rubber—L. Bassam ...	...	64·5	73·0	58·2	195·7
F. Deudney ...	...	72·1	98·0	57·0	227·1
					1200·2

Congratulations to the Northern Heights M.F.C. on winning the London District Inter-Club Challenge Cup, as announced in a stop press line in the November issue. Walthamstow beat Bushey Park in a close contest in the third round of the event, and met Northern Heights (who had a bye in this round) for the finals. Full times for the third round and finals are given opposite.

One thing is noticeable from the above results, and that is that gliders are now more than holding their own when it comes to competing with the rubber-driven models for duration. In fact it was the power-driven jobs that lost Walthamstow the Cup! How much this is due to deteriorating stocks of rubber is difficult to ascertain, but there is no getting away from the fact that the rubber shortage has brought in its train a concentration on gliding that was very necessary in this country, with beneficial results. No doubt we shall be able to compete on level terms with the Continental countries when peace-time contests are again with us, which could not be said before this war except in a few isolated instances.

Quite a few letters to hand from overseas this month, first being from India, G. Livingstone-Blevins writes:—

" Both my father and I are ardent modellers and we have made several models out here, both scale and duration types, including a model of my own design which, though simple and straightforward both in construction and design, gave a remarkably good performance. I say gave because the model no longer exists. It tried conclusions with the ground and unfortunately came off second best.

" The ground around this district is very unsuitable for landings, being as hard packed as concrete. No matter how smoothly a model comes in to land something is bound to break. Either the undercarriage is wiped off or a wing tip is smashed. It is very discouraging. My models have all come to grief in this way. One of my larger ones, a very good performer indeed, touched down beautifully some distance from where I stood after a flight of 2 mins. 34 secs. From where I stood it seemed to be all intact but when I retrieved it I found that the propeller had been smashed to pieces against a stone and the undercarriage had been driven up through the fuselage !

" Rubber is another great difficulty (don't tell me, I know). Aero strip is impossible to get and I have to be content with an inferior type of rubber which is invariably half perished.

" I receive the AEROMODELLER *regularly for which I am very thankful. It is my only link with the modelling world.*

After the war (which means any day now) I intend to take up petrol modelling. Tell Dr. Forster that I promise to install my engines inverted."

Another letter coming from a reader who is a prisoner of war in Germany (sorry, I've mislaid his name) reads :—

" I've had the glider out for a few trips with varying success, and as a number of guys in this Lager are interested, we have organised the ' K ' Lager Model Aero Club (Lager K means the camp) of which I am Secretary, and Vice-Secretary is Bill Downing, of the Ealing M.A.C. Could you let Mr. Chapman, of 198, *Toton Lane, Stapleford (Mr. Chapman is the Secretary of the Nottingham M.A.C (?)) know this. Material is a big bug-bear but we make do with odd scraps, match sticks and boxes, cigarette papers, Red Cross boxes, etc."*

L.A.C. Greenslade of the R.A.F., C.M.F. believes that his unit has the honour of being the only R.A.F. unit in Italy with an active model aero club. They are lucky in having a well fitted out " Auster " crate for a clubroom and workshop, and about twenty members are busy, chiefly on solid models. Plans are obtained from Blighty, and models built from scrap of all sorts, and an exhibition is planned in the near future. Truly a busman's holiday ! !

Another very interesting letter comes from L.A.C. Holley, recently returned from West Africa. It is a triumph of improvisation, as the letter shows. He writes :—

" During the tour, Cpl. Paterson, L.A.C. Webb and myself decided to attempt a few models. No suitable tools were available, so we made our own. For paint brushes we used locks of hair tied to pieces of wood, razor blades were broken to varying sizes and shapes, a hacksaw blade of which about three inches still had teeth, and one small half round file !

" Pat and I decided to make a ' Mosquito ' and Tom a 'Miles M 28 *' (his first attempt at modelling). Fortunately, I was still receiving the* AEROMODELLER*—about three months old by the time we got it—but none the less welcome, especially so in view of the fact that it was our only source of plans. The wood came from mosquito net braces, and although from time to time we were queueing up for tools, things began to take shape.*

" Rubber tyred wheels were made from slices of rubber cable, bomb doors from metal from cigarette tins, navigation lights from toothbrush handles, etc. The painting of the models didn't turn out at all well at first. We couldn't get a decent finish until by experiment we found that by rubbing down with Silvo a perfect finish was obtained—very smooth but not too shiny. Perhaps this tip is worth passing on.

" Possibly we have been instrumental in starting a model aero movement in West Africa, as before we had finished we had a couple of house boys filing and chipping away. In closing I might mention that our modelling activities certainly helped to pass what might otherwise have been very boring hours, and is one of the few pleasures left when one is up-country and miles from civilisation."

The S.M.A.E. Cup, coinciding as it did with almost ideal weather, attracted nineteen entries from the BRISTOL & WEST M.A.C., seven being gliders and the remainder rubber. Thermals were not very much in evidence, the best flight being by B. J. Naish with a " Beauglider 3," who clocked 2 : 48·8, this being a new club glider record. The best three aggregates were made by gliders, R. Morgan flying his F.A.I. model very consistently to aggregate 5 : 19·25.

The Club Gala Day on October 2nd was cold, damp, and windy, and it was decided just to run off the club two and three-float seaplane contests. The former yielded better results than in previous years, four models managing to make at least one flight each, in spite of all too frequent duckings in the pond. M. Garnett won the event with two flights aggregating 1 : 0·1, but in the three-float contest, D. Jones was the only person to make flights, winning with an aggregate of 0 : 25.

The Club started indoor meetings on October 7th, when a good crowd gathered to watch and participate in the club " spot landing " contest, and the month's club entry for the S.M.A.E. Class B models. The former contest, when points were scored according to the quadrant the model stopped in, was won by E. Hurley after some most amusing taxying, when his model just managed to stagger over the line from a low section to a high one. The Class B event demonstrated very effectively that much more experience is required before the club can get up to the three minute standard, the average flight being about 50 secs. W. J. Gould and A. H. Lee put up the best show, the latter improving after the contest unfortunately, and starting to clock 80–90 secs. quite consistently. R. T. Howse brought along his 1/24th scale Lightning, and had some nice flights with it, whilst two helicopters were seen, neither flying as yet, in readiness for the club Helicopter competition.

The CARDIFF M.A.C. were the winners of a Welsh Rally held in August, in competition against the Mountain Ash and Ebbw Vale M.F.C. The latter club suggest the formation of a Welsh League, also the selection of a Welsh team to challenge teams from England during 1945. Interested clubs should contact the Ebbw Vale secretary, Mr. A. W. R. Marbin, 22, Alfred Street, Ebbw Vale.

Word comes from the BASINGSTOKE & D.M.A.C. appealing for more members. It is known that a lot of AEROMODELLER's are sold in the district, so muck in all you enthusiasts and support your local club.

The MIDDLESBROUGH & D.M.A.C. recently

challenged the Eston M.A.C. to a gliding contest, and in spite of damp weather, the teams of four put in some average flying, with a best time of 65 secs. going to both A. Brewer and B. Kell respectively. Eston won with a total of 300 points to the Middlesbrough bag of 260.

The ARBROATH M.A.C. have started their winter season with a bang. Although meetings are at present being held in the Session House of Ladyloan Church, reconnaissance planes are out searching for a suitable permanent clubroom. Winter meetings will be held fortnightly from 4th November. All aeromodellers in the district are invited to join this club by attending these meetings or contacting the secretary, D. F. Gilder, 10, Marketgate, Arbroath.

Although the club held no competitions this summer, members put in much flying time, and some notable flights were recorded. Two club records were broken. A flight of 85 secs. o.o.s. by D. F. Gilder constitutes a new glider record, and a flight of 80 secs. by W. H. Littlejohn is a new record in the 100–150 sq. ins. rubber powered class.

Among the new models this year is a tandem-wing duration designed and build by D. D. Edward. The lifting tail surface is 60 per cent. of the wing area, almost equal span, and same airfoil section. Good stability was obtained, but duration so far is low, best flight being 45 secs., owing to the rubber shortage.

The North Romford M.A.C., which will in future be known as the ROMFORD & D.M.A.C. is holding an exhibition of flying and solid models at the Jutsams Lane Hall, Romford, on December 15th, commencing at 7.30 p.m. During the show, members will compete for the Indoor Flying Cup, and all interested are extended a hearty welcome.

The KESWICK & D.M.A.C. is getting on its feet now, and meetings are better attended than hitherto. One member has been flying a jet propelled model with some success, and I look forward to hearing more news of this at a later date.

Several NORTHERN HEIGHT M.F.C. members went to Birmingham to watch the Sir John Shelley Contest, and all managed to thoroughly enjoy themselves in spite of the rather adverse weather conditions.

At an extraordinary general meeting held recently it was announced that Mr. R. Copland has been elected to a Life Membership of the N.H.M.F.C. for the services he has rendered in the field of model aviation.

In the Thurston Trophy Contest, the top times were put up by Lt. Ivor Hall with 6 min. 18 secs. aggregate, F. E. Wilson 4 min. 40 secs., and R. Copland 4 min. 35 secs., while in the S.M.A.E. Cup Contest, R. Teasle obtained an aggregate of 535·1 secs., R. Copland 463·3 secs., and F. E. Wilson 445.5 secs.

In the second round of the London District Cup Contest, the team from Northern Heights beat their opponents, the Pharos M.A.C. Copland lost his streamlined Wakefield in the clouds after 463·3 secs. on its first flight. D. Lofts, also flying a streamlined Wakefield, obtained an aggregate of 5 min. 40·2 secs. and F. E. Wilson flying a streamlined F.A.I. Glider obtained 3 min. 58 secs. J. Davall, who flew a diamond parasol glider of approximately 3½ oz. sq. ft. loading, obtained 5 min. 1 sec. aggregate, making a total team time of 1342·8 secs. against the Pharos total of 939·2 secs.

A newly formed club in the Bournemouth district, the QUEEN'S PARK M.A.C. is progressing well, though unfortunately their ground is surrounded by high trees, that does not make for good flying. J. D. Jones, when testing a 7 ft. sailplane lost same from a 70 ft. towline, the model being recovered from three miles away. Altogether some good flying has been experienced this summer, and petrol models are now being built in readiness for the 1945 season.

On September 24th, with a gale blowing and occasional rain, a few members of the SURBITON & D.M.A.C. went to Epsom Downs for the Streatham clubs Glider Day—and their first experience of winching. D. Butler made best time of the day with 1 : 30, placing second in the final results. The Surbiton team also placed second in the team event, but Butler's plane was wrecked when an enthusiastic finder waved it at him !

The AYR (Y.M.C.A.) M.A.C. held an Open Day on October 7th, when representatives of five clubs competed. The day was perfect, and some fine flying was witnessed, particularly in the glider section. Full results were :—

Rubber.	J. McChesney (Dalmellington)	2 : 22·8
	M. Rillie (Ayr Y.M.C.A.)	2 : 07·8
	D. G. Hodinott (Ayr Y.M.C.A.)	1 : 29·2
Glider.	C. Ewart (Stewarton)	3 : 24·2
	J. Clegg (Kilbirnie)	3 : 9·2
	W. Wilson (Stewarton)	2 : 03·6

W. Rillie and D. J. Hodinott hold most of the records in this club, the former having the H.L. duration figure of 1 : 21, and the r.t.p. record of 1 : 58, while Hodinott holds the R.O.G. record at 0 : 57, also ties with Rillie for the r.t.p. honours.

The WORCESTER M.A.C. held a most successful rally recently, some 2,500 folk witnessing a grand afternoon's sport. (The city Electrical Department lent their tower wagon, which fully extended made a wonderful observation post !) Thirty-five competitors entered for the four events staged, and some fine flying was seen, best flight of the day going to G. H. Williams, whose glider flew for 3 : 22. A. H. Viles glider put up 3 : 08, while the best rubber powered flight was made by E. Kenrick's model which clocked 3 : 01. Full results were :—

Worcester Corporation Cup (Gliders).

A. H. Viles (Worcester)	5 : 56
G. H. Williams (Worcester)	3 : 22
J. E. L. Bishop (Worcester)	3 : 01

G. Elt Cup (Rubber powered).

E. Kendrick (Birmingham)	3 : 58
J. P. McGill (Worcester)	2 : 31
S. Guy (Tewkesbury)	2 ; 13

A. V. Band Cup (Gliders).

J. E. L. Bishop (Worcester)	5 : 05·5
J. P. McGill (Worcester)	3 : 16
A. H. Viles (Worcester)	3 : 03

Solid Scale.

Senior. G. H. Evans
Junior. J. Holmes.

Enthusiasts residing in the Taunton area and who are interested in the building of flying and solid models are invited to communicate with the secretary of the TAUNTON & D.M.A.C., R. Blackmore, 28, High Street, Taunton. Owing to the small membership, no competitions or exhibitions were held during the past summer,

FREDDIE, WHO IS ALL AT SEA THIS MONTH—APPEARS ON PAGE 34.

and the club is now appealing to all aeromodelling fans in the district to join the club. Now is the time for all you Taunton lone hands to get together so that the sport can be fully enjoyed by all.

ESTON AREA M.A.C. held a very successful exhibition on the 30th September, by means of which the club funds were nicely boosted and hopes of a larger clubroom strengthened. T. A. Brewer raised the club glider record to 1 : 55, whilst a " Thermic 50 " built by N. V. Brunton has flown well straight off the board.

TORQUAY & D.M.A.C. put it across the Newton Abbott club on the Milby Downs, totalling 473 points against the Newton total of 370·5 in a glider team effort. Torquay's best flights were put up by J. Higgins who aggregated 3 : 37, Newton's best being L. Webber with an aggregate of 2 : 00. B. Crute won the Kay Cup for gliders (winch launched) aggregating 4 : 43·5, Higgins placing second with 2 : 59·2.

Persons in the Sheffield district interested in organising a club are asked to contact R. Thomas, of 91, Mona Road, Crookes, Sheffield. J. Dobson, of 24, Carlton Road, Pendleton, Salford, is also anxious to get a club started in his district, so roll in you Pendletonites.

And so, for the present I leave you, but not to forget a most important duty ! This being once again the " festive season " I hereby wish all my readers—and even those who skip these columns ! ! !—all the best of good luck for this sixth wartime Xmas, and may we soon see the end of all this strife and a speedy return to the good old times when rubber was plentiful, and we really had time to build and fly models. Personally, I shall welcome with open arms the opportunity to get down to some really serious modelling, but as things are at present, I am sadly handicapped. (Oh yes—the secret can now be told, as the information will not at this date be of assistance to the enemy ! Yours truly has been in the R.A.F. for over a year now, so perhaps you will now understand the occasional slang that has crept into these columns from time to time.)

Anyway, to show you what I mean, may your kiting next year be bang on, with wizard thermals and bags of joy. And let us all hope that by this time next year, Jerry will have well and truly ' had it.'

Cheers,

THE CLUBMAN.

NEW CLUBS.

MONTROSE M.A.C.
K. B. Whyte, 82, Murray Street, Montrose, Angus.

N.A.S.O. 219 M.A.C.
J. Battersby, Broomhill, Prince's Drive, Colwyn Bay, N. Wales.

SOUTHBOURNE & D.M.A.C.
A. Russell, 212, Ilford Lane, Southbourne, Bournemouth, Hants.

SECRETARIAL CHANGES.

GRANTHAM M.A.C.
O. J. Lee, The Turret, Barrowby High Road, Grantham.

CHEAM M.A.C.
H. P. Costenbardor, 50, Wordsworth Drive, North Cheam, Surrey.

COVENTRY M.A.C.
A. J. Barr, 29, Foster Road, Radford, Coventry.

S.M.A.E. REPORT

The S.M.A.E. would like to wish all readers a Very Merry Christmas and a Happy New Year.

The year now drawing to its close has been a record one for the Society, seeing by far the largest ever number of entries into competitions, and the enthusiasm of the clubs throughout the summer season shows good prospects of being continued during our winter programme. Nor are the Country Members lagging behind, as is shown by the ever-increasing number of letters to the Society's Officers, offering suggestions and good wishes.

Turning our thoughts to the future, the forthcoming A.G.M. will no doubt see many schemes put forward by members from all parts of the country for an even more interesting and varied programme for Model Aeronautical Engineers of all types.

The Winter Programme of the S.M.A.E. includes Solids Contests for the No. 1 and No. 2 Trophies ; the No. 1 Contest commencing October 1st, 1944, and all models must be ready for preliminary judging at Area Headquarters by the 28th February, 1945. The No. 2 Trophy will be awarded for a Contest commencing April 1st 1945, and for which models must be ready for judging by the 31st August, 1945. All winners and runners-up will be forwarded to London for final judging, which will be done by a panel of three or more. This final judging will take place at the end of March and September respectively.

In addition to the No. 1 and No. 2 Trophies, winners and runners-up will receive cash prizes and certificates of merit. It is of interest to note here that the term " solid " denotes any faithful static copy of a prototype, as distinct from a flying model, and can be built in the same manner as the full size aircraft with ribs and formers, etc., if so desired. Sectional models and scale components such as engines, etc., may be entered, and if there is sufficient demand a separate class known as " Detailed Components " will be available.

Although any scale is eligible, the 1/48 scale is considered the most practical, and it is the desire of the S.M.A.E. to develop the larger type of solid.

Entrance Fees are : Juniors (up to 16) 1s. and Seniors 2s. 6d. per model, and these should be sent to the Hon. Comp. Sec., Mr. H. J. Towner, " Trencrom," King's Drive, Eastbourne, who will issue a numbered receipt. The contest is open to all members of the S.M.A.E. including Country and Associate Members.

The Indoor Pole Flying Competition is open to all Affiliated Clubs. There are two classes of models ; Class A for models up to 1 oz. max. weight, and Class B from 1–2 ozs. ; the events to be run for each of three months consecutively, Oct./Nov./Dec. and Jan./Feb./March. Two flights per entrant shall be allowed R.O.G. and the aggregate of these are to count as points. There is no restriction on the number of attempts made by the club's member during each month, and all such attempts are eligible for the Individual Aggregate Prize.

The results should be forwarded to the Hon. Comp. Sec., to arrive not later than seven days after the end of the month during which the attempts were made, together with an entrance fee of 2s. 6d. per club to cover both classes. The aggregate of the best three flights per club will determine the winning club each month, and in addition the best individual flight will determine the winning individual monthly. Prizes will also be awarded to the individual who obtains the best aggregate monthly. The collective results will be tabulated and prizes awarded for the best individual results extended over each of the three monthly periods.

Class A shall be allowed a pole of 3 feet maximum height and a maximum length of line of 6 ft. Class B shall be allowed a pole of 6 ft. maximum height and a maximum length of line of 12 ft. Length of line to be measured from the top of the pole to the centre line of fuselage. Should it be found necessary to reduce the length of line allowed in either class, the height of pole shall not exceed half the length of line in use.

In view of the large number of requests received for an extension to the closing date for the Bristol Cup Contest, which is open for all types of models of Bristol Machines or Products, it has been decided to make this date the 31st December, and all entrants should send their names and address to Mr. F. E. Wilson, 34, Babington Road, Hendon, London, N.W.4. All models entered will be exhibited in the S.M.A.E. Exhibition which is to be held in the Showrooms of the Bristol Aeroplane Company from Jan. 22nd, 1945, to Feb. 3rd, 1945.

In addition, it is desired to exhibit a number of flying scale models, sailplanes, petrol and duration models, solid, etc., etc., as in the previous exhibition held in August. Any members wishing to exhibit their models should write giving details to Mr. Wilson,

who will supply particulars. Prizes and certificates will again be awarded for the best models.

Support for the S.M.A.E. Journal is very gratifying, and we would like to thank all those who have written to the Editor offering suggestions, and also all those clubs who so promptly ordered their copies. We again invite all Club Secretaries and Press Secretaries to let us have news of their activities regularly for inclusion, and would like to draw their attention to the fact that the Society now possesses display cards, etc., which are available for use in local club exhibitions, etc. A number of clubs have, indeed already availed themselves of this latest facility.

INSECTS—MASTERS OF FLIGHT, by Frank W. Lane.

The author wishes to make two slight amendments to this article which was published in the October and November issues.

In the first part of the article, published in October, the reference to the wing-tip speed of insects should have read :

(This) is higher than that obtained for some birds. The word "some" was unfortunately omitted.

In the second part of the article, published in November, the following sentence should be added to the fourth paragraph of the article, that dealing with the take-off of the house-fly :

But other workers consider that the artificial conditions of the set-up for the filming may have caused the fly to react in an unnatural manner.

AIRSCREW BLOCK SIZES, by R. A. Gray.

We regret the appearance of typographical errors in the article "Airscrew Block Sizes" in the November issue. The errors are as follows :—

First column, 2nd paragraph, 3rd line, should read 23 sq. ins., and not 2·3 sq ins.

Second column, 3rd line, should read $\frac{a}{b} = \text{Tan } \theta$.

Third column, end of 2nd paragraph, should read 4½ point = ·75 of 6 ins.

Formula at the bottom of the 3rd column should read Y = n SIN θ, and not 7 = N SIN θ.

Second calculation in column 3 should read Y = 1·7 × ·5025 = LOG. 2304. The answer to this calculation should read Y½ = ·8541 ins.

The tabulated figures of the 4th column should read :

1½ point where X = ·5019 ins.
Y = 1·145 ins.
3 point where X = 1·668 ins.
Y = 1·862 ins.
4½ point where X = 2·408 ins.
Y = 1·788 ins.

The examples following this list should read X = 2·408 and Y = 1·862.

PLUGGE CUP RESULTS

	NAME OF CLUB	Gamage	Weston	M.E. No. 2	National	Pilcher	Flight	M.E. No. 1	K. & M.A.A.	Thurston	S.M.A.E.	Adjusted Plugge Points
1	Pharos	922	598	468	170	507	445	201	475	590	848	5224
2	Aylestone	850	739	357	169	530	450	195	459	607	846	5202
3	Surbiton	783	622	438	165	434	400	200	374	612	875	4903
4	Croydon	895	677	419	163	504	212	199	350	587	883	4889
5	Birmingham	812	714	419	167	384	317	191	445	617	802	4868
6	Streatham	672	663	432	160	441	409	194	402	643	851	4867
7	Northern Heights	900	496	342	168	371	367	198	424	531	787	4584
8	Merseyside	585	757	301	166	423	408	178	310	462	608	4198
9	Walthamstow	735	645	102	158	475	276	197	—	614	856	4057
10	Blackheath	900	705	315	164	247	389	190	147	360	597	4014
11	Cheam	826	705	395	156	346	418	193	337	433	740	3723
12	Bristol	734	559	316	151	—	314	175	428	364	573	3614
13	Rhyll	675	699	—	171	—	351	188	—	508	738	3390
14	Hayes	522	658	113	—	476	—	186	—	616	665	3236
15	Leeds	657	587	304	159	393	133	—	—	—	634	2867
16	Blackpool	279	452	311	152	277	108	173	234	271	461	2718
17	Brentford	783	—	—	—	498	428	189	127	534	—	2559
18	Kingsheath	697	485	187	157	169	194	168	377	—	—	2434
19	Norwich	664	—	—	—	390	—	180	313	358	582	2387
20	Bradford	—	381	—	162	398	—	187	—	552	629	2309
21	Luton	466	482	—	154	—	97	196	300	572	—	2267
22	Thames Valley	569	584	—	—	—	—	182	125	375	416	2251
23	Agricola	338	324	—	155	272	84	169	—	260	597	2199
24	Harrow	332	149	—	150	—	—	185	—	206	592	2114
25	Newton Abbot	453	177	—	153	72	134	171	269	306	369	2104
26	York	—	558	—	—	—	—	184	—	490	644	1876
27	Stretton	476	678	—	—	—	—	176	—	—	533	1863
28	North Kent	502	—	—	—	—	—	174	—	528	563	1767
29	North Birmingham	—	496	—	—	—	—	181	—	543	464	1683
30	Bushey Park	924	698	—	—	—	—	—	—	—	—	1622
31	Tetbury	190	284	—	149	—	269	172	171	—	359	1594
32	West Yorks	356	501	—	161	—	149	—	—	—	408	1575
33	Leicester	423	—	—	—	—	—	179	—	396	510	1508
34	Whitefield	—	—	—	148	318	78	166	—	360	372	1442
35	Bromley	385	—	313	—	—	—	183	—	—	533	1414
36	Coventry	352	—	—	—	—	—	177	—	—	757	1286
37	East Birmingham	211	175	—	147	—	—	170	—	195	301	1199
38	Sale	518	567	—	—	—	—	—	—	—	—	1085
39	Grantham	444	401	—	—	—	—	—	—	218	—	1063
40	Chingford	534	445	—	—	—	—	—	—	—	—	979
41	Chelmsford	219	2	—	146	—	247	164	—	—	152	930
42	Wallasey	—	415	—	—	—	—	—	—	—	439	854
43	Ripon	—	—	—	—	153	—	—	—	—	684	837
44	Penn	—	577	—	—	—	—	192	—	—	—	769
45	Guildford	—	—	—	—	—	—	167	—	—	464	631
46	Oxford	592	—	—	—	—	—	—	—	—	—	592
47	Witney	561	—	—	—	—	—	—	—	—	—	561
48	Eston	—	—	—	—	—	—	—	—	—	502	502
49	Middlesbrough	24	430	—	—	—	—	—	—	—	—	454
50	Stratford-on-Avon	442	—	—	—	—	—	—	—	—	—	442
51	Torquay	—	428	—	—	—	—	—	—	—	—	428
52	South Birmingham	—	255	—	—	—	—	165	—	—	—	420
53	Edinburgh	103	211	—	—	—	—	—	—	—	—	374
54	Worcester	—	344	—	—	—	—	—	—	—	—	344
55	Upper Stratton	341	—	—	—	—	—	—	—	—	—	341
56	177 A.T.C.	—	—	—	—	—	—	—	—	156	144	300
57	Hatfield	—	—	—	—	—	—	—	—	—	274	274
58	Cardiff	155	—	—	—	—	—	—	—	115	—	270
59	Eastbourne	60	—	—	—	—	—	—	—	—	—	60
60	Hornsey	—	—	—	—	—	—	—	—	—	18	18

Made and printed in Great Britain by Alabaster, Passmore & Sons, Ltd., London and Maidstone, for the Proprietors and Publishers, The Model Aeronautical Press, Ltd., Allen House, Newarke Street, Leicester. Trade Distributors : Horace Marshall & Son, Ltd., Temple House, Tallis Street, London, E.C.4—C1601. Sole Agents for Australia and New Zealand : Gordon & Gotch (Australasia), Ltd. Registered at the G.P.O. for transmission by Canadian Magazine Post.

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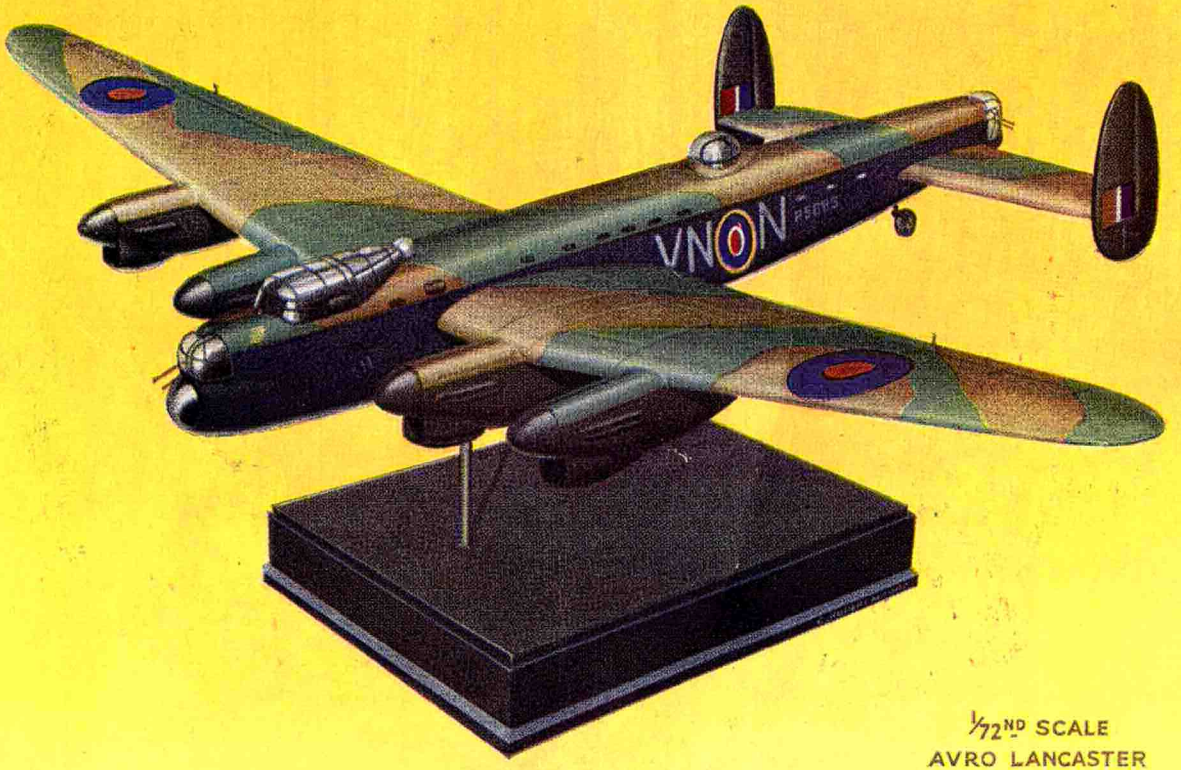

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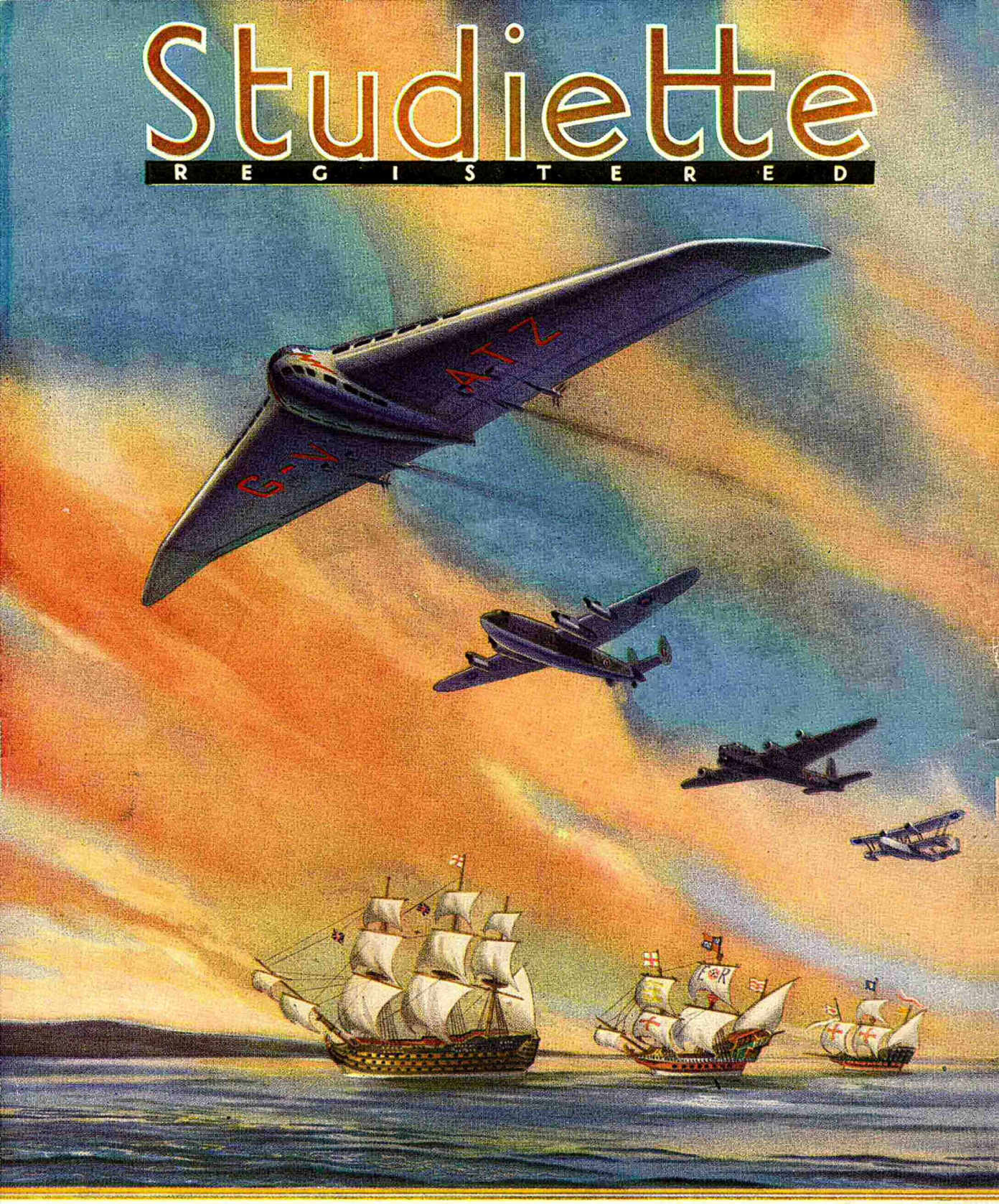

To the very many modellers who have obtained "Studiette" model outfits and shown their appreciation, we express our earnest wish that the near future will enable us to develop fully the opportunities that have been presented by the achievements of the Armed Forces. We trust that the present restrictions will be lifted to enable us to offer a wide and varied selection of Aeroplane and Galleon Kits for the keen modeller. Studiette will endeavour to give our friends the support that their patience and forbearance has deserved during the past war years, when our activities were fully directed to essential war work.

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