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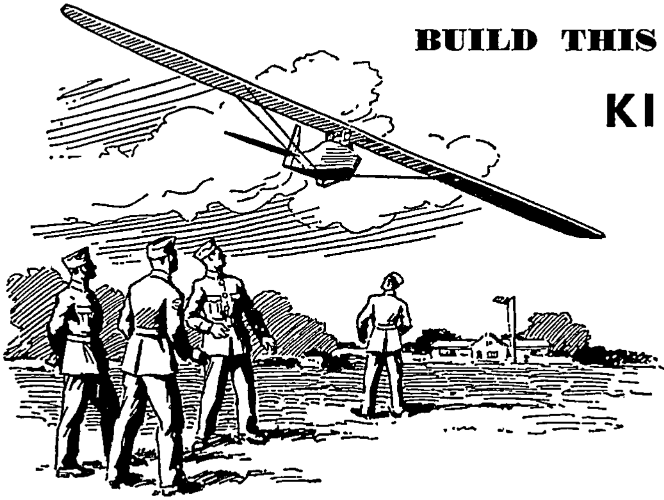

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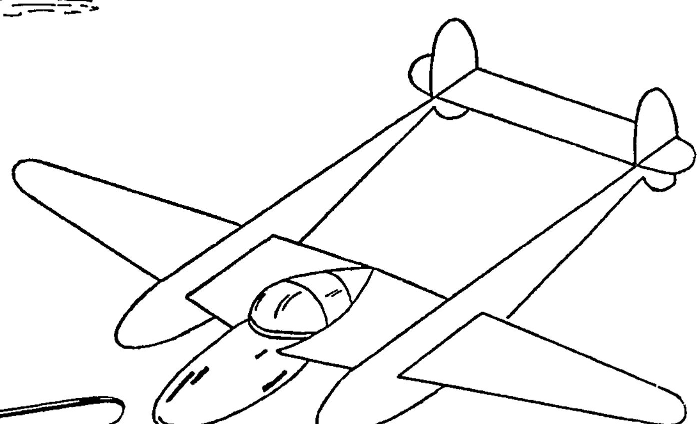

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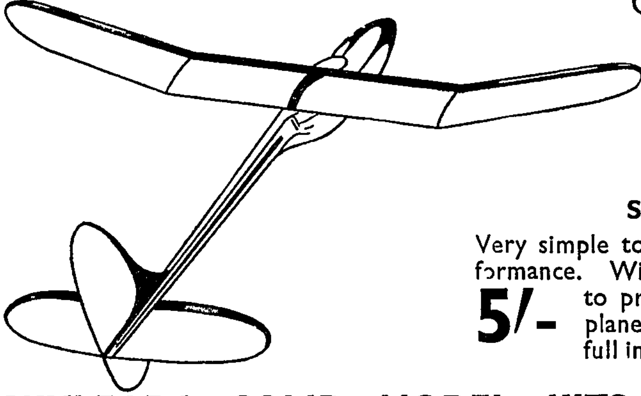

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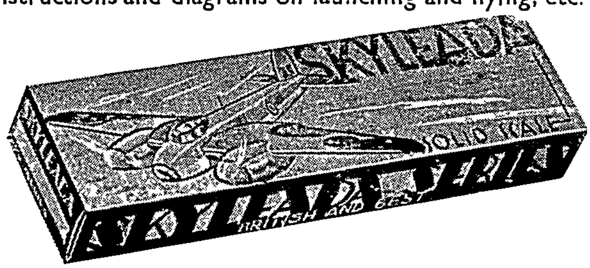

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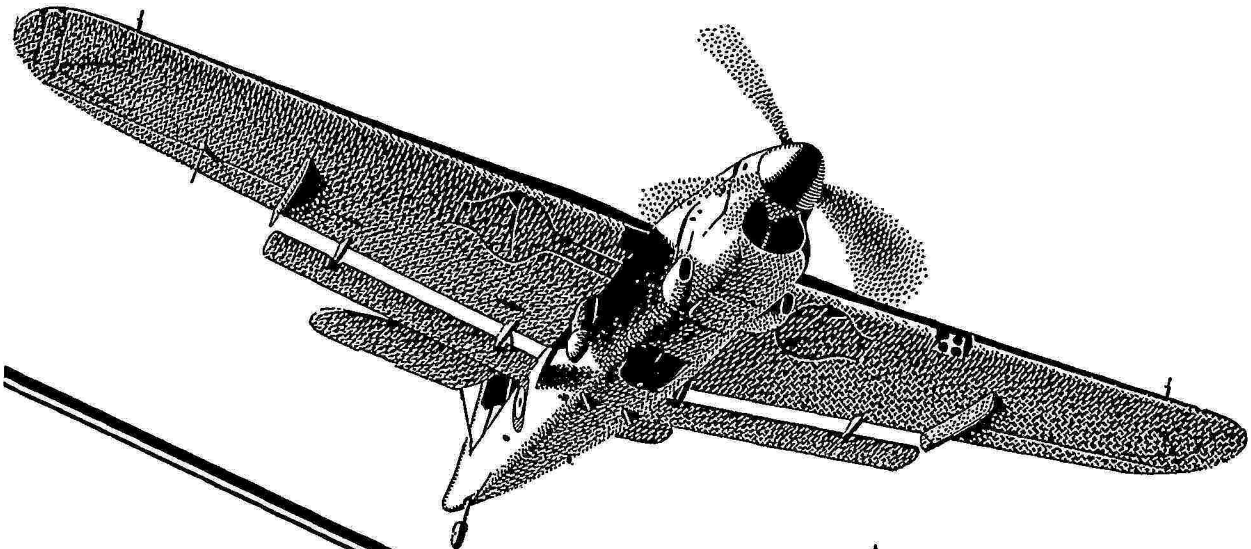

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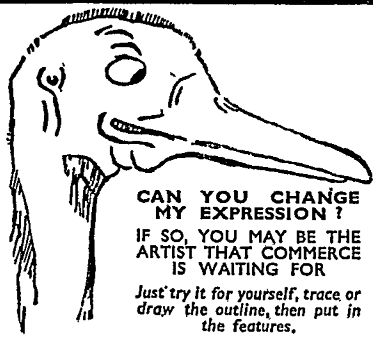

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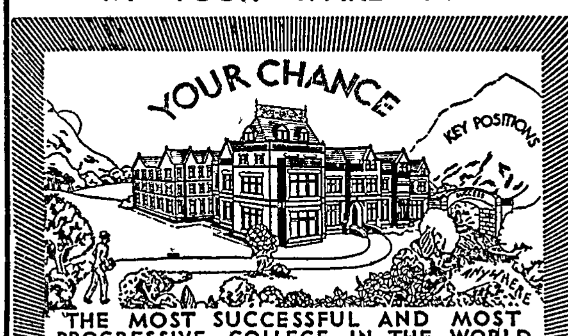

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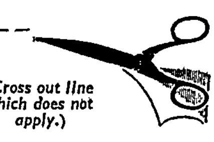

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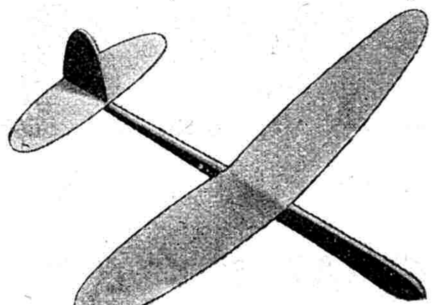

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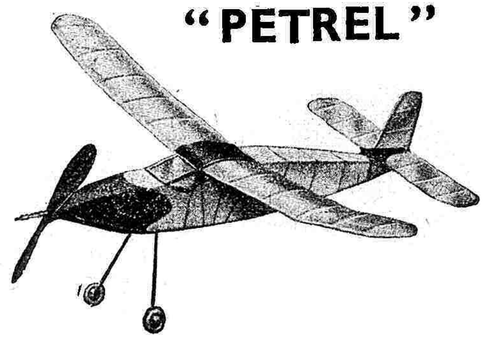

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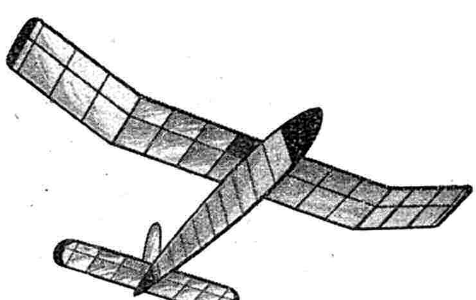

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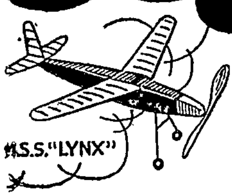

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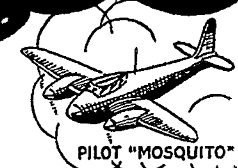

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ESTABLISHED 1935

VOL. X No. 119 OCTOBER, 1945

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Contents

AIRBORNE ARCADIAN. Mr. D. R. Murrin's sailplane "Evander" banks gracefully into wind during tests by the "Aeromodeller" Staff. Like its mythical namesake, this machine is both strength and grace personified, whilst its performance can only be described as superb.

EDITORIAL

MORE ABOUT DORLAND HALL

LAST month we announced that the AEROMODELLER would hold a second National Model Aircraft Exhibition at Dorland Hall, Lower Regent Street, London, from Friday, December 14th, to Saturday, January 12th, and drew particular attention to two points. One was that we were planning for many more exhibits than were on view at the first exhibition last January. The other was that much greater attendance should result from the fact that the Exhibition is to remain open for four weeks (except for two or three days at Christmas), and that this period covers the school holiday.

This month we wish to refer to the competitive side of the Exhibition, and to the special facilities to be provided for the convenience of the model aircraft trade. The competitive instinct is highly developed in the human species generally, and not least in the aeromodelling sub-species. Hence, we believe that the offering of substantial prizes for the best exhibits will not only add to the general enjoyment, but will produce models of excellent quality and in goodly numbers. We found this policy very effective last time, and for the forthcoming Exhibition are increasing the number and value of the prizes. Not only do we feel that this will have the effects mentioned ; we also trust that it will be taken as practical expression of appreciation of the co-operation of modellers. Speaking generally, that which we receive for nothing tends to be worth little more than that; conversely, we are confident that the money being put into this new venture and the time and trouble being taken over it will result in a finer show than any yet seen in aeromodelling circles.

Full details of the classes of models for which prizes are offered are given in this issue. The contest rules, and information as to the obtaining of your entry form, will appear in the November AEROMODELLER. Here we propose to give an outline so that readers may have an additional four weeks in which to consider to what degree they will co-operate with us and to make a start.

As our readers are well aware, our policy is to encourage the development of all types of model aircraft, flying and non-flying, and, incidentally, to foster in aeromodellers an attitude of unbiassed interest in lines of approach other than those which they happen to favour. This policy will be reflected in the range of the contests at Dorland Hall. To begin with, there will be a section for the ever-popular duration class of model. Any duration type can be entered, and prizes are offered for the best efforts by seniors (16 years of age and over) and by juniors (under 16). Then there will be a section for gliders and sailplanes, and in view of the energy diverted into this channel through the famine in rubber strip, we look for some exceptionally interesting and highly-developed models in this category.

Petrol model enthusiasts, after years of frustration due to the war, are now making up for lost time, despite the fact that motors are not too easily obtained, and we expect strong representation of this group. There will be two contest sections—flying-scale or semi-scale petrol-engined types, and free-lance designs. Flying-scale models of the rubber-driven or glider types will be catered for in two categories—¾ in. to the foot, and larger models. There will also be a section for general and experimental types of model. All models will be fully insured whilst at the Exhibition, and in transit to and from it.

Then come two classes of model that have been much neglected in the past, the float seaplane and the flying-boat. Perhaps the neglect was inevitable, for few of us are fortunate enough to live anywhere near a large shallow pond with gently shelving sides and situated a respectable distance from tall trees, fences and other obstructions. Added to this difficulty there was, of course, the ever-present possibility of a waterlogged model. Both of these snags virtually disappeared with the introduction of the portable canvas launching-tank, and one can only marvel that it took the aeromodelling community so long to think of this ingenious method of "bringing the sea to the seaplane." Flying-boats have presented the further problem of contriving a satisfactory thrust-line placing, but in recent years considerable progress has been made with this class. Anyway, at Dorland Hall there will be separate categories for seaplanes and flying-boats. Then, in the non-flying category, there will be prizes for 1/72 scale models, and sizes above and below this figure.

With the exception of the petrol-engined class, there will be separate sections in every class for seniors and juniors.

Finally, there will be senior and junior championship prizes for the finest entry irrespective of type, and entries in all other sections will automatically become eligible. In each championship section there is offered a very substantial cash prize and a solid silver trophy to be held for one year.

In all, the cash prizes amount to over £300, and there are to be no entrance fees.

We now turn to the special facilities offered to members of the model aircraft trade. Many who visited the Exhibition last January experienced the need of a room where they could meet other members of the trade, and of a brochure giving an adequate description of the Exhibition and serving as a means of propaganda for the movement. Both of these needs will be met in the forthcoming Exhibition. A room will be provided at the Hall, and will be available to *bona fide* traders, for a nominal payment, throughout the period of the Exhibition. It will be furnished with easy chairs, tables, and a telephone, and a capable secretary will be in attendance to take letters, notes, telephone messages, etc., and give general assistance. Admission to this room will be by a membership ticket that will also give free entrance to the Exhibition itself.

A brochure will be issued, with details of the exhibits and contest entrants, list of prize winners, and carrying advertisement panels in which trade members can bring home to the tens of thousands of visitors the fact that there is a model aircraft shop in their locality. This brochure will be on sale throughout the period of the Exhibition. Full information regarding the room for trade members and the brochure can be obtained from the AEROMODELLER office at Wilmary House, Merton Lane, Highgate, London, N.6.

"Eaton Bray" is Born

When this issue of the AEROMODELLER appears, a milestone in model aeronautical progress will have been passed, for Eaton Bray Aerodrome, in its new guise as the world's first models sportsdrome, will be a fortnight old. September 15th, 1945, will go down in aeromodelling history as the day on which this eagerly-awaited "Modellers' Mecca" came into use.

We can afford to admit that as yet Eaton Bray is far from being what we, its fond parents, desire and intend that it shall become; for it is a well-favoured and lusty infant. The grass, sown as recently as the spring of this year, is not yet sufficiently luxuriant and consolidated as to withstand with impunity the tramp of the enthusiastic legions of modellers that we expect to see there next year when rallies and contests begin on the grand scale. Neither can there yet be discerned—except, possibly, by the eye of faith—the comprehensive amenities—concrete take-off areas, model accessories store, buffet, etc.—that we have planned. But basic human needs have already been met, and modellers can fly all types there on any Saturday or Sunday from 10 a.m. until dusk. Drinking water, lavatory accommodation for both sexes, one small concrete take-off area, parking space for cars and cycles, and some protection from stab-in-the-back attacks by the weather, are available; and the admission charges are one shilling for adults and sixpence for those under 16; with a 50 per cent. reduction for arrival after 3 p.m. Flying can be indulged in over any part of the ground, subject only to the general direction of the Aerodrome Manager, and club members are free to organise contests among themselves provided that these do not interfere with the convenience of other visitors.

Meanwhile, despite continuing restrictions and handicaps, plans are going forward for the full facilities promised and the formal opening of the ground in the spring of 1946.

Aeromodelling Abroad

On page 542 of this issue will be found the first of the articles which are to appear under the general title of "Aeromodelling Around the World." As already mentioned, they are being written by a special correspondent after careful study of reports sent in by aeromodelling agents in various countries.

The writer begins very fittingly by introducing himself, incidentally with an exuberance that we are sure our readers will find highly diverting. But, as the discriminating will readily perceive, the humour masks a diffidence in "blowing his own trumpet" that is characteristic of those who know what they are talking about. The writer, in short, is a practical modeller of lengthy experience; moreover, he has avoided the rut that cramps the inventiveness and limits the outlook of so many modellers; he has also a close acquaintance with the organised aeromodelling movement. The outcome is a balanced judgment that should prove invaluable in assessing the worth of the varying trends in design and construction.

The articles themselves are in similar vein to the introduction, and we are glad to have them so, for they should prove thereby readable to the least technically-minded of our readers. There are times when it is difficult to deal with technicalities without risk of becoming ponderous, but when humour can be interwoven with the thread of the discourse, we are all for it and believe that most readers will concur.

As to the subject matter, the articles will deal with things rather than people—the kinds of models being built, the way the movement is developing, and so on. What individuals are doing is also of interest, as we are well aware, but this aspect will be covered in another series of articles from a different pen.

This month our correspondent takes us to the United States. The American people and ourselves have come to a close understanding and mutual appreciation that even the snap ending of lease-lend cannot vitiate, and it is much to be desired that their modellers and ours shall be in the vanguard of this "bigger and better get-together." Each side has much to learn from the other, and united they can do much for aeromodelling and for the cause of international friendship.

Further articles already envisaged will deal with modelling in Canada, Rhodesia, Palestine, Italy, France, and even wartime Germany.

Modelling After Two Wars

The end of the second world war, unlike that of the previous conflict, finds aeromodelling more than holding its own Whatever the reason may have been, the 1914-1918 war virtually wiped out our movement. Outstanding modellers and clubs disappeared, valuable trophies were lost sight of, and while for a time peace saw some desultory flying, the ensuing slump all but finished the trade, and doubtless gave many modellers a full-time occupation in looking for a job or in keeping it.

A number of factors has probably contributed to the vastly different situation at the close of the recent war. To begin with, by the time Hitler let hell loose, the aeromodelling movement was soundly established, and mindful of "last time," there was a general determination to maintain "continuity"—to borrow the term employed by a well-known modeller at a meeting of the S.M.A.E. at the outbreak of war—even if no more than a skeleton organisation should prove possible. Happily, total war was less disruptive than had been anticipated. Flying-grounds were requisitioned, but model supplies never quite gave out, modellers kept going somehow, and the existence of pre-service groups such as the A.T.C. induced the authorities to be helpful to some degree. And why should we of the AEROMODELLER be so excessively modest as to make no reference to the part we have played by maintaining a journal little reduced in size despite many difficulties and restrictions, in staging an exhibition of wartime models, and in organising the first aerodrome for modellers?

The outcome of all this is that the aeromodelling movement, with peace here, is in an exceptionally favourable position to play a worthwhile part in youth movements, and in the realms of sport and international goodwill.

Let us hope that all will be alive to the opportunities presented.

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WITH ACCOMPANYING MODEL COMPETITIONS

Organised by The "AEROMODELLER"

Open daily from Friday, December 14th to Saturday, January 12th, excluding December 23rd, 24th, and 25th—at the

DORLAND HALL, LOWER REGENT ST., S.W.1

Over £300 in Cash Prizes and Silver Trophies

Never before, in the history of Model Aeronautics, have competitions been organised on such a grand scale. Make sure that you submit at least one entry—more, if possible—and so place yourself in the running for one of the splendid cash prizes. All entries automatically become eligible for the Championship Competition, according to age group. Here is a chance to win yourself the laurels of the Aeromodelling World. Remember there are :—

NO ENTRANCE FEES

Full details, including Competition Rules, method of obtaining your entry form, etc., will be announced in the NOVEMBER "AEROMODELLER."

Competition No. 1

Class A—SENIOR CHAMPIONSHIP.
Open to Competitors above the age of 16 years for the finest entry, irrespective of type. Prize—£30 and Solid Silver Trophy, to the value of £30, to be held for one year.

Class B—JUNIOR CHAMPIONSHIP.
Open to Competitors of 16 years and under, for the finest entry, irrespective of type. Prize—£20 and Solid Silver Trophy, to the value of £20, to be held for one year.

Competition No. 2.
NON-FLYING MODELS

Class A—MINIATURE MODELS UNDER 1/72nd SCALE.
First Prize, £6 ; Second Prize, £4 ; Third Prize, £2.

Class B—FOR MODELS OF 1/72nd SCALE (built by Competitors above the age of 16 years).
First Prize, £6 ; Second Prize, £4 ; Third Prize, £2.

Class C—FOR MODELS OF 1/72nd SCALE (built by Competitors of 16 years and under).
First Prize, £3 ; Second Prize, £2 ; Third Prize, £1.

Class D—FOR MODELS ABOVE 1/72nd SCALE (built by Competitors above the age of 16 years).
First Prize, £6 ; Second Prize, £4 ; Third Prize, £2.

Class E—FOR MODELS ABOVE 1/72nd SCALE (built by Competitors of 16 years and under).
First Prize, £3 ; Second Prize, £2 ; Third Prize, £1.

Competition No. 3.
DURATION MODELS OF ANY TYPE

Class A—(For Competitors above the age of 16 years).
First Prize, £6 ; Second Prize, £4 ; Third Prize, £2.

Class B—(For Competitors of 16 years and under).
First Prize, £3 ; Second Prize, £2 ; Third Prize, £1.

Competition No. 4.
FLYING SCALE MODELS

Class A—FOR MODELS OF A SCALE UP TO AND INCLUDING ⅜-IN. TO THE FOOT (built by Competitors above the age of 16 years).
First Prize, £6 ; Second Prize, £4 ; Third Prize, £2

Class B—FOR MODELS OF A SCALE UP TO AND INCLUDING ⅜-IN. TO THE FOOT (built by Competitors of 16 years of age and under).
First Prize, £3 ; Second Prize, £2 ; Third Prize, £1.

Class C—FOR MODELS ABOVE THE SCALE OF ⅜-IN TO THE FOOT (built by Competitors above the age of 16 years).
First Prize, £6 ; Second Prize, £4 ; Third Prize, £2.

Class D—FOR MODELS ABOVE THE SCALE OF ⅜-IN. TO THE FOOT (built by Competitors of 16 years and under).
First Prize, £3 ; Second Prize, £2 ; Third Prize, £1.

Competition No. 5.
MODEL SEAPLANES

Class A—(For Competitors above the age of 16 years).
First Prize, £6 ; Second Prize, £4 ; Third Prize, £2.

Class B—(For Competitors of 16 years and under).
First Prize, £3 ; Second Prize, £2 ; Third Prize, £1.

Competition No. 6.
MODEL FLYING BOATS

Class A—(For Competitors above the age of 16 years).
First Prize, £6 ; Second Prize, £4 ; Third Prize, £2.

Class B—(For Competitors of 16 years and under).
First Prize, £3 ; Second Prize, £2 ; Third Prize, £1.

Competition No. 7.
MODEL SAILPLANES

Class A—(For Competitors above the age of 16 years).
First Prize, £6 ; Second Prize, £4 ; Third Prize, £2.

Class B—(For Competitors of 16 years and under).
First Prize, £3 ; Second Prize, £2 ; Third Prize, £1.

Competition No. 8.
FREE-LANCE PETROL MODELS

First Prize, £6 ; Second Prize, £4 ; Third Prize, £2.

Competition No. 9.
FLYING SCALE OR SEMI-SCALE PETROL DRIVEN MODELS

First Prize, £6 ; Second Prize, £4 ; Third Prize, £2.

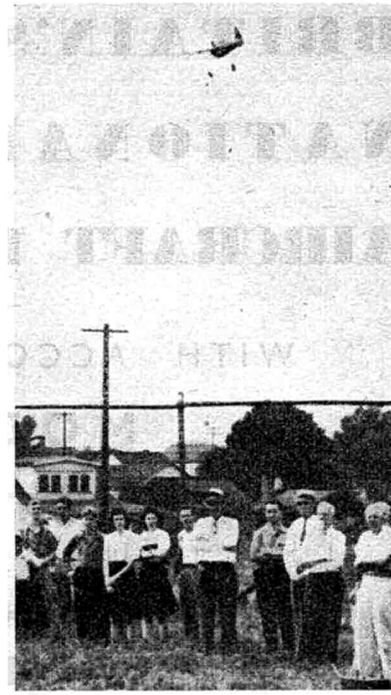
Competition No. 10.
GENERAL AND EXPERIMENTAL

Class A—(For Competitors above the age of 16 years).
First Prize, £6 ; Second Prize, £4 ; Third Prize, £2.

Class B—(For Competitors of 16 years and under).
First Prize, £3 ; Second Prize, £2 ; Third Prize, £1.

AEROMODELLING AROUND THE WORLD

BY OUR SPECIAL CORRESPONDENT



ONCE upon a time, when the aeromodelling movement was quite young, and therefore not nearly so nice-mannered as it is today, a very illuminating little incident occurred at a well-known London model flying ground. A certain individual, more renowned, perhaps, for flights of fancy than flights of fact, was attempting to take a little group of fumbling novices under his wing, metaphorically speaking, and concluded his words of wisdom with the cordial invitation, " Now, when you get stuck, just come to me and I'll tell you all you want to know." Came the crushing rejoinder from one plain-spoken youngster, " What—you ? Why, you can't fly your own penny kite properly yet."

No ! the present writer was *not* the victim of that little skirmish. But perhaps, ere some hypercritical reader enquire of the editor, " Who is this bloke, anyway ? " it might be as well for me to see what I can muster in the way of credentials before presuming to hold forth on so extensive a theme as global model aeronautics.

Let me confess at once that I have not travelled all over the world, that in addition to English (cockney variety) I can speak only a little American and even less French (sufficient, say, to get me from the Eiffel Tower to the Folies Bergère), and that I have never won a duration contest, still less the Wakefield Cup. But, on the other hand, I have been fiddling around for more years than I care to remember with bits of wood and wire, chunks of tissue paper, and the contents of stolen golf balls ; I have been guilty of building a spar model that some 30 years ago scared the stuffing out of some Greek villagers on an island in the Aegean ; I have often been cussed but never kissed while timing model contests ; and have never been more than six months behind with my correspondence while acting as a club secretary. In short, what I am trying delicately to hint, gentle reader, is that I do know my way around the aeromodelling world, and have over the fleeting years acquired a fairly comprehensive experience of things and people, and with it all have managed to retain sufficient enthusiasm still to venture out occasionally with a model, despite the approach of old age, and to climb trees to retrieve said model, despite the agonised protest of creaking joints (mine, not the model's). These qualifications, surely, should satisfy the most carping critic.

AMERICA—ESPECIALLY AKRON

Crouching reverently beside my undercarriage as I write is my nondescript but faithful little tyke (obviously built to no particular formula), contemplating a bone that doubtless should have gone into salvage, and wondering just where to begin. Similarly, I myself face uncertainly a pile of documents sent in by AEROMODELLER agents from places as far apart as Wigan and Medicine Hat. Just where shall *I* begin ?

Yes, of course.. What a handy fellow he was who invented the alphabet. Of course. We'll begin with A—and that means not only America, but Akron, which, as no doubt you know as well as I do, is in the United States. Akron appears to be the home town of a good many of the foremost aeromodelling enthusiasts in the States, and in consequence, the scene of numerous " meets " (rallies to you), and the centre of much movement. To begin with, there is an " Akron Council " comprising a judicious mixture of experts and " laymen," all very level-headed and enthusiastic, who have been responsible for many big " do's," and have also found time to lay solid foundations for a body known as the " Model Air Cadets " of America. There are at present some 300 members, and Mr. J. L. Thompson, the energetic secretary, is careful to keep before everyone the educational, vocational and character-building aspects of model aeronautics, as well as the sheer joy of it when intelligently managed.

Modellers from all over the States have been attracted to the contests held at Akron, including those of the Cadets, and it was here that there first emerged into the limelight, Mrs. Emily Orman, sole feminine contestant to reach the finals in the last great nation-wide

(Above.) A U-control " Fireball " at Akron streaks away over the heads of the crowd who are watching the operator.

Watching final adjustments to the motor of a U-control model.

contest held there. At the most recent meeting, there were no fewer than 456 models entered for the contests, and the proceedings were watched by an interested crowd of between 8,000 and 10,000. Among those present were the heads of several aircraft manufacturing concerns, and that one-time juvenile film prodigy, Jackie Coogan, now a Flight Officer and not so long ago member of a Commando in the Burma Glider Command. Coogan, it is interesting to learn, has stated that he made his first attempts at model aircraft building while on one of his early film tours in Germany.

At this big meeting at Akron an interesting sideshow was staged in a huge tent, where there were solid models of all kinds, including replicas of most of the world's fighting aircraft. Workmanship and faithfulness to type were the deciding factors in awarding the numerous valuable prizes, some of which were won by quite youthful competitors.

Technical highlights of the meeting were a contest flight of 28 minutes (exceeding the previous record by four minutes) by a tiny cabin job, and a speed of 90 miles an hour achieved with a " Fireball," the latest U-control model, which won first prize for models in this category.

Coming now to the matter of model flying generally in the United States, some interesting facts emerge from our correspondents' reports. To begin with, one is extremely interested to learn (and somewhat pained, having regard to the fact that one's own half-dozen yards of used quarter-inch strip live in a safe deposit between the intervals of being taken to what the military authorities have left to us of Wimbledon Common) that supplies are now available of strip that is declared to be non-synthetic and of pre-war quality. It is also reported that " considerable numbers " of petrol motors, including most of the popular makes, have been released, and that a priority certificate system is in force to prevent batches being collared by members of the mighty army whose motto is " Pull up the unmentionable ladder, Jack: I'm aboard," to the detriment of individual would-be purchasers.

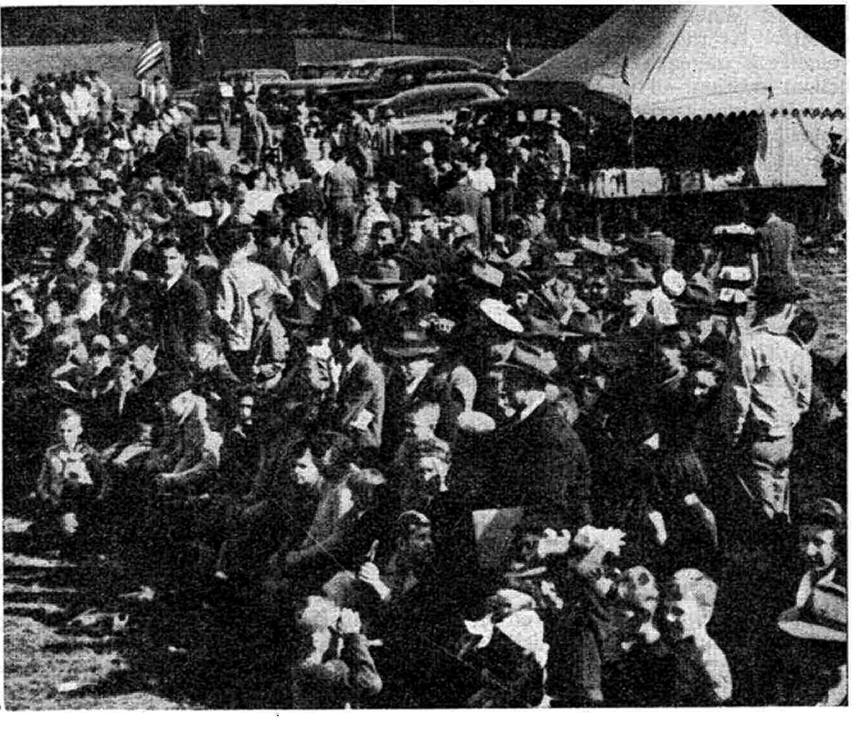
The model aircraft trade, states one correspondent, is putting out a good deal of material of such a nature and quality as to make it clear that a square deal for purchasers is the intention rather than quick returns. Of the more orthodox goods, there are kits of a great variety of designs, some of them at remarkably low prices. The less conventional items available include plans for jet motors, radio control devices, and helicopter kits. There is also being advertised a five-cylinder radial motor for models—the Morton M.5—five inches in diameter, 22 oz. in weight, and estimated to give ½ horse-power at 3,500 r.p.m. The price, less coil, condenser, tank and propeller is just under £20. Assuming that it works without too big a display of temperament, it would seem a likely unit for a radio-controlled model.

One manufacturer is offering a gadget which quickly and easily checks the pitch of any true-pitch propeller, diameter from 8 inches to 16 inches, for rubber or petrol models. It is issued as a kit which can be assembled in half-an-hour, and its direct reading scales for geometric pitch, effective pitch, and miles per hour, are claimed to be accurate to within one per cent.

In Chicago, one learns, there has been formed " Flying Circus Inc.," a recent advertisement of which reads as follows: " Producing the greatest model show ever. It will be staged indoors before a paying audience in all the leading cities. We need unusual acts and stunts that can be performed with model 'planes (rubber and control-line gas). If you are 18 or over write for details."

In view of the fact that the Wakefield Trophy still reposes in America, it is cheering to hear from another AEROMODELLER agent that there is one field in which that country appears to lag behind Britain—to wit, the high-performance glider. Over there, seemingly, the prevailing type is a somewhat flimsy adaptation of the rubber duration slabsider, and the British heavy-weight semi-monocoque job is virtually unknown.

And now, to end on a vigorous note instead of merely fading out for a month—it is reported that U-control flying is enjoying a boom, and that a new unofficial record of 135 miles an hour was set up recently, this blood-curdling performance being brought to a premature end by the sudden capitulation of the control lines—fortunately after the crowd had departed.



A section of the enthusiastic crowd at a recent meeting at Akron. Note the large tent in the background presumably containing the show of solid model aircraft mentioned above.

JET PROPULSION

AND ITS POSSIBLE APPLICATION TO MODEL AIRCRAFT

BY G · W · W · HARRIS

IN continuing this series I am once more guided by correspondence received by the Editor and myself. Many readers have sent along drawings of proposed J.P. units which invariably require some sort of air compressor but few have so far defined just what type they would use or have given any clue as to just how they would construct it. This is quite understandable as we have no first-hand knowledge of air compressors of suitable dimensions for the small scale we are working to. My own experience to date indicates that for powering a miniature aircraft weighing 8 lbs. with a turbo-compressor unit, the compressor would be about 2·5 ins. diameter. And, I believe, that its speed of rotation would be something like 25,000-30,000 r.p.m. if mounted on the turbines shaft direct.

Unless we can successfully design and construct such a compressor there is little point in attempting the task of producing a turbine to drive it. At the same time we must not forget that if a compressor is produced we may well consider driving it with an I.C. engine in conjunction with a system of augmentors. (This is a subject, by the way, which deserves our attention in the near future, and if anyone has experimented on these lines, we shall be pleased to hear of their experiments.)

Air compressors are for general purposes divided into two classes: (A) Centrifugal, (B) Propeller. These two classes are represented by very many variations, most of which will not concern us.

Fig. I shows a typical propeller type. It consists of a hub around which blades are arranged radially. No casing or air guides are fitted. A light metal frame supports the power unit and provides a means for mounting the fan. Such a fan as this functions as follows: When the blades are rotated the gas enters axially. At the leading edges of the blades the gases velocity is increased so that it leaves the blades with a helical motion. The kinectic energy of the flow is therefore increased, thus a stream of gas leaves the fan travelling at high velocity. Fans of the above type are, of course, normally associated with building ventilation.

Fig. 2 shows a propeller type fan fitted inside a casing to obtain a static pressure. A casing of this type is known as a diffuser tube.

Next we have " radial flow " or " steel plate " type fans, these, although the same in principle, vary considerably in design.

Figs. 3, 4 and 5 show three forms of " radial flow " fans. The flat blade types are intended for low rotational speeds, the forward curve blade types are used for high speeds, whilst the backward curve blades are used for low and intermediate speeds. These " squirrel cage " fans—as they are sometimes called—will, for a given diameter, handle greater quantities of gas than any other type of compressor. When designing radial flow fans of the forward curve type the following points should be borne in mind :—

(1) For a given static pressure they should operate at the lowest possible tip speed.

(2) If high speeds are desired the blades must be of small radial dimensions, in which case the blades must be increased in numbers. (Blades vary in numbers per fan from 20 to 60 or more.)

Working Pressure.

Not more than 6 ins. of water can be expected from any of the aforementioned fans.

The next step up in radial flow fans are classified as " pressure blowers." See Fig. 6. Here you will see large span blades of small chord are used. Usually these blades are flat. Air enters through the aperture in the centre of the circular shroud plate. Note the casing into which the blower is fitted. Such blowers as this will develop something like 24 ins. of water and are suited to high speeds.

Lastly we come to the turbo-blowers and turbo-compressors; these represent the last word in centrifugal blowers.

Because their outputs are higher than the previous types mentioned the pressures they develop are generally given in lbs. per sq. in. Up to 30 lbs. per sq. in. they are known as turbo-blowers and blowers that give pressures in excess of this figure are accepted as turbo-compressors.

By multi-staging it is possible to obtain output pressures as high as 150 to 180 lbs. per sq. in. Each stage consists of a rotor complete with its own scroll casing and the stages are connected from one to the other with suitable conducts. Fig. 7 shows a typical rotor.

Now the important question is, can we hope to produce a satisfactory blower of such small dimensions as, say, 2·5 diameter ? I think that this is quite possible, but a large amount of experiment will undoubtedly be needed to decide on the best type and the proportions of its layout. I have perused a number of text-books on the design of blowers but I have not yet found any formula or tables that can help us. In fact, from a theoretical point of view, there is every indication that it is impossible, but somehow I do not think J.P. enthusiasts will deter on the strength of theory alone without an effort from a practical point of view.

Recently, when examining a German jet-propelled aircraft, I was interested to find that the blowers of its units were of the axial flow type not unlike those fitted to my miniature units such as the Mk. II described in the December, 1944, issue of this journal. Straighteners were fitted between each stage and the blades had a low aspect ratio of approximately 4·1. The pitch angles were also surprisingly low—I put them at some 35 degrees. The whole of the rotors were made so far as I could see from light alloy. Another feature, and one I considered extraordinary, was that the maximum rotational speed of these units is a mere 800 *R.P.M.* (*approx.*) ! Contrary to the belief of many, these units—and others—*are not* festooned with black and soot, indeed, after a unit has been " run up," should you care to look up the outlet pipe or nozzle you will find everything inside is quite bright and relatively clean.

C. R. Tootle, author of the original article on J.P. units in this journal, has conducted several interesting experiments on the subject of combustion which are well worth studying. (*To be published in the November issue.*—Ed.) This report is especially interesting in so far as it reveals how much can be attained with the simplest of apparatus.

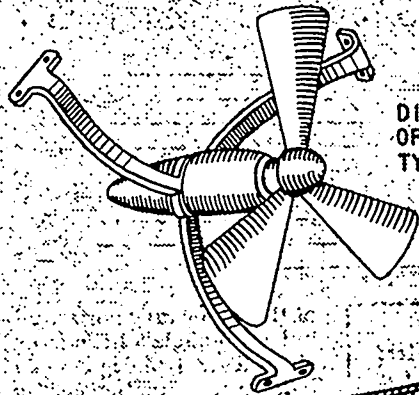


FIG. 1

DIAGRAMMATIC SKETCH OF A PROPELLER TYPE FAN

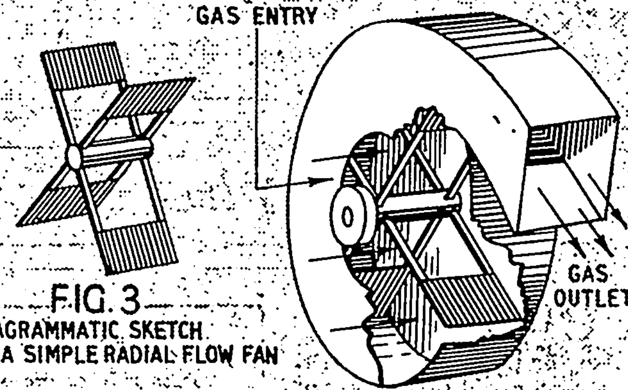


FIG. 3

DIAGRAMMATIC SKETCH OF A SIMPLE RADIAL FLOW FAN

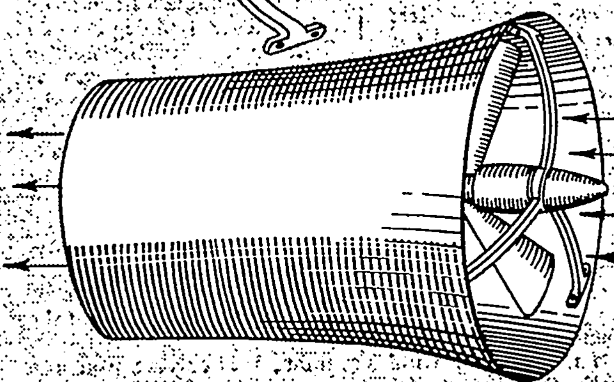


FIG. 2

DIAGRAMMATIC SKETCH OF PROPELLER FAN FITTED IN A DIFFUSER CASING

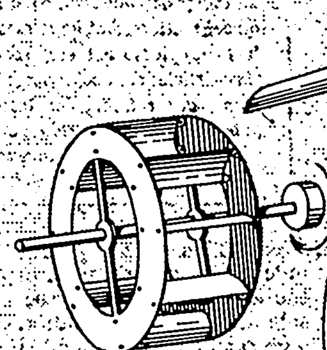


FIG. 4

A FORWARD CURVE TYPE FAN

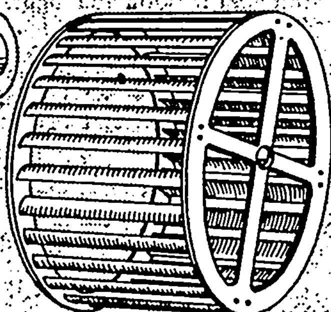
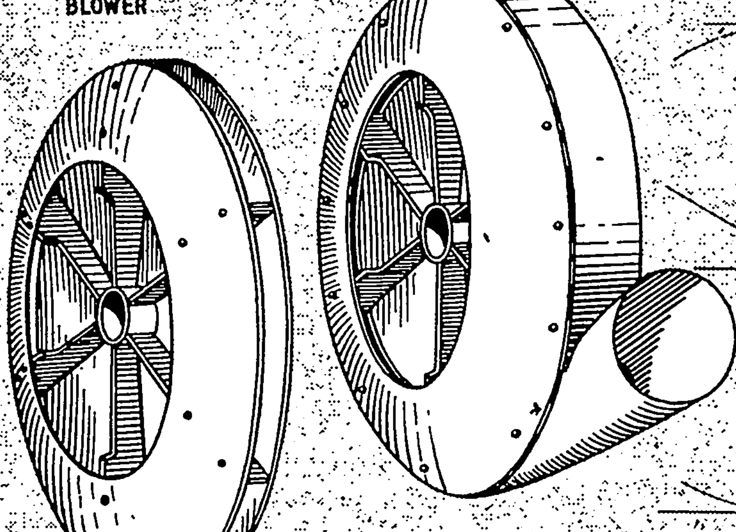


FIG. 5

SQUIRREL CAGE TYPE FAN

FIG. 6

PRESSURE BLOWER



PRESSURE BLOWER CASING

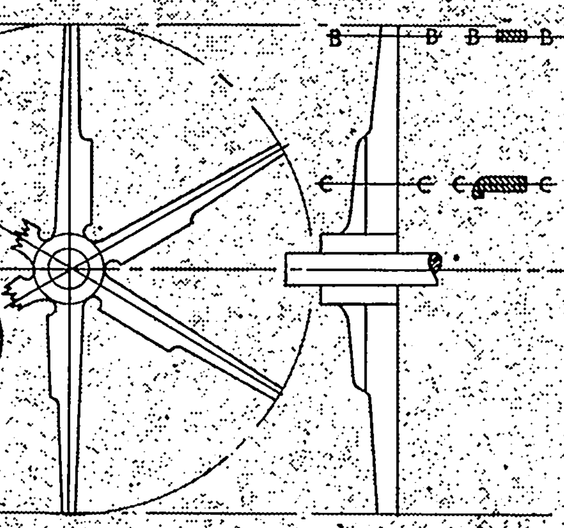


FIG. 7

TURBLOWER ROTOR 6 TO 8 BLADES IS GENERAL

S. Boyce

The Boomerang

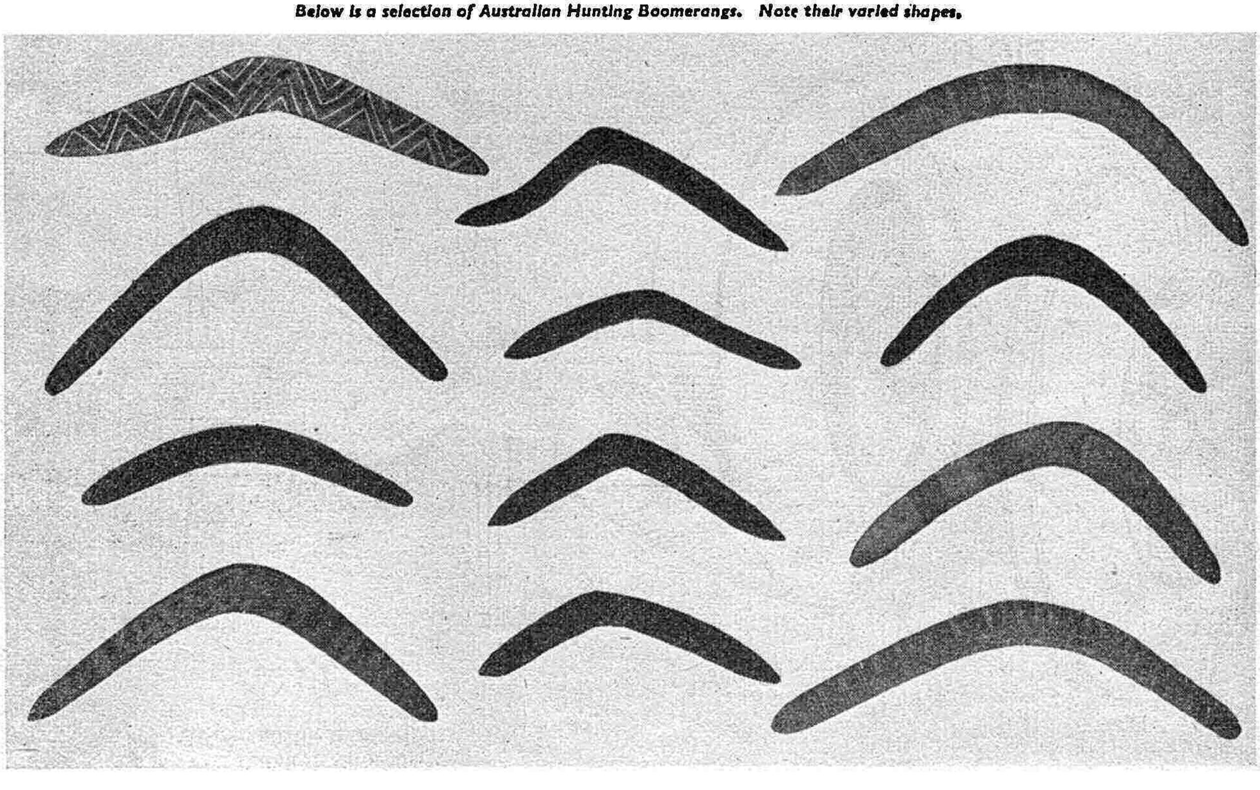
All our readers will be familiar with the name of Lord Brabazon of Tara. He is well-known for his interest in all things aeronautical, but it is for his particular interest in model matters that he is most esteemed by aeromodellers. It is with pleasure, therefore, that we present to our readers this article on boomerangs, in which many interesting points are raised. For instance, we too have seen no published scientific explanation of a boomerang's flight and we invite readers who have theories to send them in.—Ed.

CONSIDERING the remarkable characteristics of the flight of the boomerang, it is odd that it has not attracted more interest and study. Its historic past is usually associated with the aborigines of Australia, but it has been found elsewhere.

It would be well to describe in detail its form and flight. Of course there are various shapes, but the more usual and most interesting is the one that returns to the thrower. This weighs about 5 ozs. It is shaped like a rounded L but with arms of equal length. The grain of the wood follows its shape. It is slightly rounded on one side and flat on the other. Placed on a table, the right way up is with the rounded side up, and the plane of the whole structure is often not flat but shows a propeller pitch of about 4 in. for a complete revolution in an anti-clockwise direction. In throwing a boomerang with the right hand the end is held with the rounded side on top, and the other end of the L to that which is grasped, pointing forwards if held in a horizontal position. It is not thrown with the plane of the boomerang horizontal but at an angle a little more vertical than 45 degrees—in fact the better the boomerang the more vertical it can be thrown and the better the flight. In throwing as much spin is imparted as possible. The throw should be violent and aimed at a point not higher than about 12 ft. from the ground at 20 yds. away. The better the throw and the boomerang the lower can be the point aimed at and the more vertical the plane of the boomerang.

If there is any wind, assuming it is coming from the north, then it should be directed half-way between east and north-east. The flight will now be as follows: Revolving about its own centre of gravity in a positive or anti-clockwise direction and inclined at an angle of about 45 degrees, it will start straight away from you, holding its own height and then start turning left-handed. It will have turned through 90 degrees at its maximum distance away from you, about 70 yds; it will have gained about twice its height and have

Below is a selection of Australian Hunting Boomerangs. Note their varied shapes.



flattened out a good deal trying to take up a horizontal plane. After the half-way point, it will tend to soar, flatten out and glide to earth. Usually the glide gets into the horizontal and rises again performing a small circle in the opposite direction to its main circle about 12 yds. in diameter. It will now be revolving very rapidly, more rapidly than at any time, and will sink slowly to the ground. This point should be very near its point of departure.

It is not my purpose to give a scientific explanation of this extraordinary performance, even if I could, nor do I know anyone who can. What I want to draw attention to is the very various forces at play and leave those inclined to worry over them.

First of all to a rotating body there is applied a force tending to disturb its axis of rotation, with the well-known gyroscopic right angle resultant. The force giving this is derived from the blades, rounded on top, flat underneath, giving a lift. This lift is asymmetrical about the plane of rotation due to the forward velocity of the system in its flight, giving unequal velocities of air over every angle of the wing tip as it revolves. This phenomenon accounts for change of direction, but not satisfactorily to the end of its flight.

However, there is another curious phenomenon that has not attracted the attention it deserves, though it did not escape Funchestre, and that is the acceleration that takes place as to its rotational speed over that originally imparted to it. Here auto-rotational phenomena comes in of some complexity reacting on its flight path.

I have made boomerangs that at the end of their flight lose all translational movement and sink to the ground at the rate of about 9 in. a second, the while they revolve so fast as almost to hum.

There is no doubt that apart from the skill of throwing it, study on the following points would be worth while. Area to weight, in other words wing loading; most convenient weight for thrower; shapes of rounded top side wing.

Personally I have found the symmetrical arc as good as the standard wing section form. Then what amount of pitch should there be on the system, so as not to absorb its rotational speed too much, and with this what auto-rotational advantages could be introduced? Is the rounded L shape the ideal? The inertia should certainly be in the extremities for sustained work. What is the most suitable material from which they can be made?

Here are indeed some problems for the scientifically inclined and for the practical experimenter with a field wide open for original investigation into some very unusual and eccentric phenomena in ballistics.

Brabazon of Tara

A PRE-SELECTED CONTROL UNIT

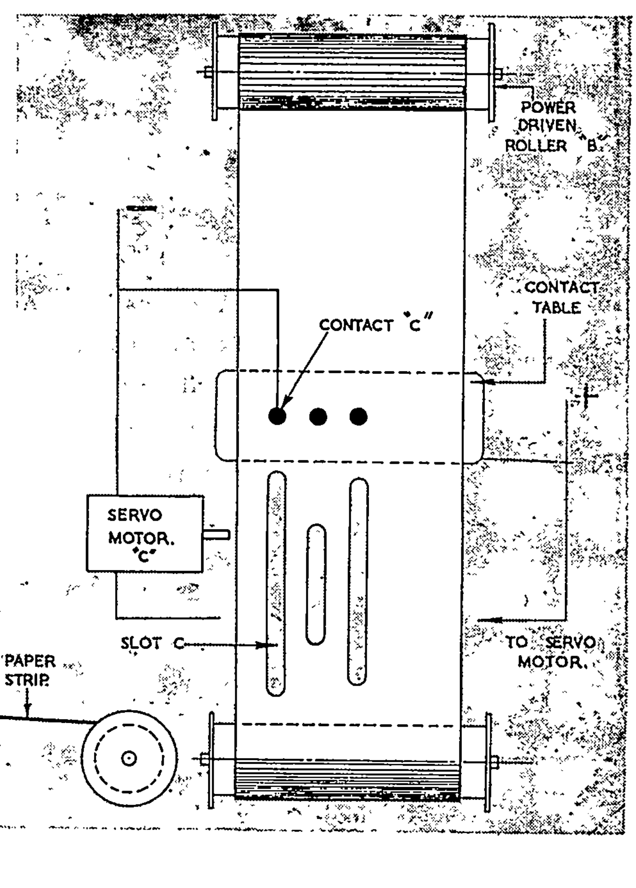
BY L.A.C. IBBOTSON

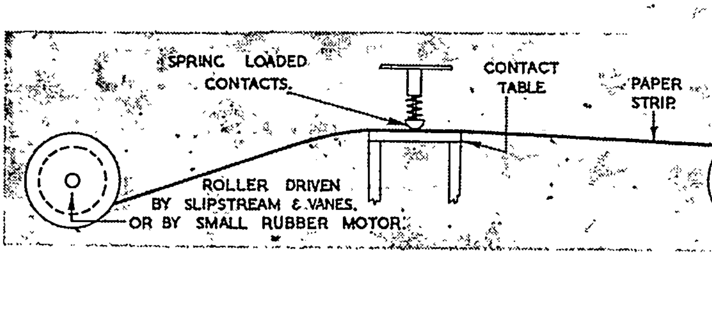
WITH the use of this unit an operator can cause his machine to perform any desired evolution in the air, the only disadvantage being that once it has left the ground he no longer has control over it, to counteract any change in flight conditions.

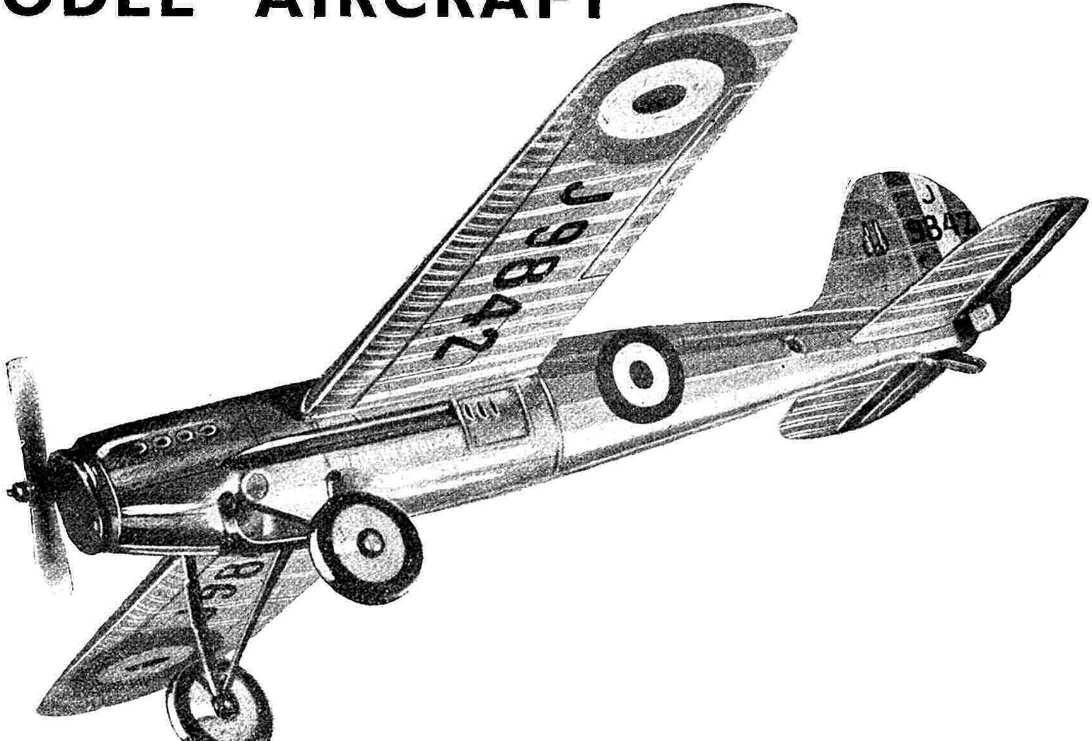
The principle is as follows:—

A paper roll about 2 in. wide is wound (by a slipstream fan or servo motor—preferably the latter) from roller "A" to roller "B," whilst between these rollers is a contact table, over which the paper passes. In the strip are cut slots of varying lengths and at different positions across the strip: mounted above the contact table are spring-loaded contacts, and these press lightly on the paper strip as it runs over the contact table. It will be seen that when a slot passes under any contact a circuit will be completed, operating a servo motor. This motor, which may be a small electric one, a solenoid, or a small rubber motor, operates the control. Most modellers will be familiar with the principles of servo-actuated controls, so I will not enlarge on them here.

In conclusion, I should like to point out that a variation of this could be used in large sailplanes to give the long sought for "figure of 8" turn.



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GLENELG

A SIX FOOT SPAN BEGINNERS MODEL

DESIGNED BY W. WILTON

Fuselage. Build the fuselage in the usual way, building the two sides first and joining them, in the first place, by formers A and B. Into these formers build the motor mounts. These are of spruce, but if metal is preferred, any builder may build in this bulkhead to take the metal mounts. I prefer wooden mounts, as they are not liable to bending and thereby altering the thrust line, as are metal ones if not carefully watched.

Before wood covering is applied to the nose, shellac the framework well around the motor mounts. Cover the top decking with 1/16 in. birch plywood first, then the sides, leaving the bottom until the undercarriage has been fitted.

Form the two undercarriage legs from 13 S.W.G. steel wire and thread through the fuselage at the proper stations. Insert hardwood gussets as shown in the plan, and solder a ½ in. diameter metal washer on to the legs where they enter the fuselage. Also solder the joint of the two legs. Internally, the wire is bound to the bulkheads by drilling small holes in each one and passing chord around the undercarriage wire and through the holes.

The loops for the tailplane anchoring are simple steel wire hook, and these must be firmly fixed and cemented. Their positions and functions are self-explanatory in the drawing.

Covering can be proceeded with only after the electrical installation has been built in as shown in the plan.

Double check all hooks and fittings, and the undercarriage before covering.

Wing. Select straight-grained hard balsa for all the spars in the wing. These spars are of somewhat unorthodox construction, but the method has proved itself in my last four petrol-driven models.

The wing is first assembled with only the leading edge, trailing edge, and the top of the two spars in place. The forming of the wing tips should be done at the same time, and when the wing is dry, it should be turned over and the bottom spars inserted. While this is drying, the wing should be pinned down on to a flat board, and when dry the spars can be completed by gluing 1/16 in. sheet sides to the top and bottom pieces, separately between each rib.

The sheet covering of 1/16 in. balsa is shown in the plan, and when it is completed 1/16 in. by ¼ in. capping strips should be glued to the top and bottom of each rib. The sheet covering, of course, is on both upper and lower surfaces of the wing.

Centre Section. After the completion of each wing panel, they should be pinned on to a flat surface, with the tips blocked up 7½ in. for the dihedral. Cut ¼ in. strips of hard balsa to form the leading and trailing edges of the centre section, and glue them in place. Form an overlay joint of all box spars by gluing medium hard balsa either side of them, as shown in the plan, and when dry, fill in the tops and bottoms with ¼ in. balsa, making a splice joint. Cut a piece of 3/32 in. 3-ply to fit along the leading edge from the ribs, one either side of the centre section, and across it. Gusset the trailing edge with hard ¼ in. balsa, and then cover the centre section with 1/32 in. 3-ply, overlapping the balsa covering of the wing panels, covering the top and bottom of the wing alike. Make doubly sure of alignment of wing panels when building them on to the centre section.

Tailplane. This unit is also of unorthodox construction. The leading edge is built up of two pieces of ¼ in. square medium balsa bent individually and glued together. The trailing edge is of three pieces, treated in the same manner. Pin these on to the plan and after forming the tips, cut lengths of 3/16 in. square balsa to form the cross bracing as in the drawing. The main spar is hard 1/16 in. by ½ in. balsa at the centre, and tapers in a convex form to zero tips. Capping strips of 1/16 in. by ¼ in. hard balsa are bent over the spar and glued to it, and the leading and the trailing edges. Round off the edges as shown in the drawing to form a section roughly similar to M.6.

Bend the tailplane hooks from 16 S.W.G. steel wire and glue firmly into place.

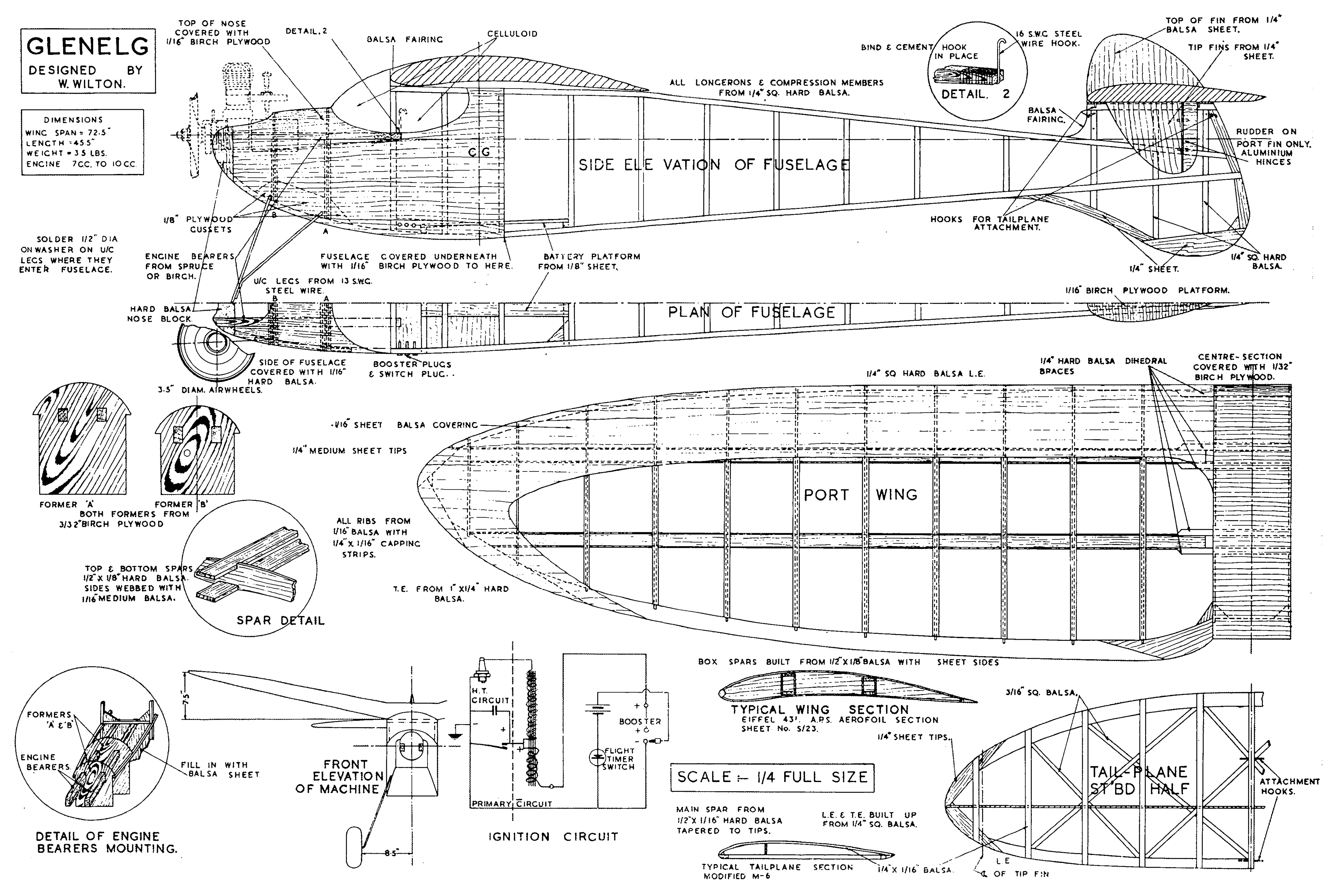
Fin. The main fin outline is easily seen, and the position is obvious. The two auxiliary fins are formed from ¼ in. hard sheet, and a rudder is built on to the port one as shown in the drawing. If this rudder area proves to be insufficient, another one can be built on to the starboard one. The three fins should be sanded to a streamline cross section and the birch plywood platform cemented to the centre one. The tip fins are cemented to the tailplane, where their width matches the width of the tailplane.

Downthrust Control. Four pieces of 18 gauge aluminium the length of the motor lugs, and as wide as the motor bearers, are necessary. Place two beneath each motor lug and by adding small washers under the rear motor lug bolt, downthrust can easily be controlled. This is necessary for fine flying, and a good way of test-flying a new model.

Flying. Fit new batteries of U 2 size if dry cells are to be used. Strap the wing and tailplane firmly into position with rubber and check for alignment. Insert washers to create downthrust as described previously, the batteries can be adjusted so as to bring the C.G. into the position shown on the drawing. When this has been done, strap the batteries firmly to the ramp with rubber. Re-strap the wing, and check for alignment.

Proceed to test glide the model, and adjust by adding negative incidence to the tailplane. Only if this becomes excessive should the incidence of the wing be increased, as the wing is built in at the angle shown on the drawing. When a long flat glide has been obtained, start the motor with the booster batteries and change on to the inside ones.

Run the motor up to an even speed and allow the model to taxi into wind. Then by adjusting the downthrust, taking out a little at the time, experiment until a good climb and glide are obtained. Leave the C.G. at the position indicated, and do not move it backwards by adjusting the battery to obtain good climb. Fly the model *with* the torque of the model in a fairly tight spiral climb. When the motor stops the turn in the glide should be considerably less.



GLENELG
DESIGNED BY W. WILTON.
DIMENSIONS
WING SPAN = 72.5"
LENGTH = 45.5"
WEIGHT = 3.5 LBS.
ENGINE 7CC. TO 10CC.
TOP OF NOSE COVERED WITH 1/16" BIRCH PLYWOOD
DETAIL. 2
BALSA FAIRING
CELLULOID
BIND & CEMENT HOOK IN PLACE
16 S.W.G. STEEL WIRE HOOK.
DETAIL. 2
TOP OF FIN FROM 1/4" BALSA SHEET.
TIP FINS FROM 1/4" SHEET.
ALL LONGERONS & COMPRESSION MEMBERS FROM 1/4" SQ. HARD BALSA.
BALSA FAIRING.
RUDDER ON PORT FIN ONLY.
ALUMINIUM HINGES
C G
SIDE ELEVATION OF FUSELAGE
1/8" PLYWOOD GUSSETS
HOOKS FOR TAILPLANE ATTACHMENT.
SOLDER 1/2" DIA ON WASHER ON U/C LEGS WHERE THEY ENTER FUSELAGE.
ENGINE BEARERS FROM SPRUCE OR BIRCH.
FUSELAGE COVERED UNDERNEATH WITH 1/16" BIRCH PLYWOOD TO HERE.
BATTERY PLATFORM FROM 1/8" SHEET.
1/4" SHEET.
1/4" SQ. HARD BALSA.
U/C LEGS FROM 13 S.W.G. STEEL WIRE.
1/16" BIRCH PLYWOOD PLATFORM.
HARD BALSA NOSE BLOCK.
PLAN OF FUSELAGE
SIDE OF FUSELAGE COVERED WITH 1/16" HARD BALSA.
BOOSTER PLUGS & SWITCH PLUG.
3.5" DIAM. AIRWHEELS.
1/4" SQ HARD BALSA L.E.
1/4" HARD BALSA DIHEDRAL BRACES
CENTRE-SECTION COVERED WITH 1/32" BIRCH PLYWOOD.
1/16" SHEET BALSA COVERING
1/4" MEDIUM SHEET TIPS
PORT WING
FORMER 'A'
FORMER 'B'
BOTH FORMERS FROM 3/32" BIRCH PLYWOOD
ALL RIBS FROM 1/16" BALSA WITH 1/4" X 1/16" CAPPING STRIPS.
TOP & BOTTOM SPARS 1/2" X 1/8" HARD BALSA. SIDES WEBBED WITH 1/16" MEDIUM BALSA.
T.E. FROM 1" X 1/4" HARD BALSA.
SPAR DETAIL
BOX SPARS BUILT FROM 1/2" X 1/8" BALSA WITH SHEET SIDES
TYPICAL WING SECTION
EIFFEL 431. A.P.S. AEROFOIL SECTION SHEET No. S/23.
3/16" SQ. BALSA.
1/4" SHEET TIPS.
FORMERS 'A' & 'B'
ENGINE BEARERS.
FILL IN WITH BALSA SHEET
DETAIL OF ENGINE BEARERS MOUNTING.
7.5"
FRONT ELEVATION OF MACHINE
8.5"
H.T. CIRCUIT
BOOSTER
FLIGHT TIMER SWITCH
PRIMARY CIRCUIT
IGNITION CIRCUIT
SCALE :- 1/4 FULL SIZE
TAIL-PLANE ST'BD HALF
ATTACHMENT HOOKS.
MAIN SPAR FROM 1/2" X 1/16" HARD BALSA TAPERED TO TIPS.
L.E. & T.E. BUILT UP FROM 1/4" SQ. BALSA.
TYPICAL TAILPLANE SECTION MODIFIED M-6
1/4" X 1/16" BALSA.
L.E
℄ OF TIP FIN

CIVIL AIRCRAFT No. 23

THE AVRO 641 COMMODORE

BY E • J • RIDING

IN June, 1933, a Waco "D" 4-5 seater biplane was registered in Great Britain, and about a year later, Messrs. A. V. Roe & Co., Ltd. produced a machine of similar appearance and layout which they named the "Commodore."

Five "Commodores" were registered in this country—G-ACNT, G-ACRX, G-ACUA, G-ACUG and G-ACZB. Another one, VT-AFN was supplied to an Indian prince for his own private use, but it returned to Great Britain in 1935 and was later written off. Several other machines were laid down, but the demand proved disappointing and the fuselages were eventually broken up at the Failsworth works of the Avro Company.

In accordance with Avro practice at that time, the "Commodore" had a welded steel tubular fuselage primary structure, upon which were mounted plywood formers supporting light spruce stringers, giving the fuselage its streamlined form. The wings were built up from section steel strip spars carrying ribs which were stamped out of aluminium sheet. The fuselage, wings and tail surfaces were fabric covered. There was a single steel tubular "N" interplane strut each side of the fuselage and the wing bracing was rather unusual in that instead of the normal landing and flying wires, a steel tubular streamlined strut was used in conjunction with a single flying wire in each wing bay.

The pilot and co-pilot sat side by side in the front seats, the control column being situated between them. By simply swinging the control wheel over it was possible to fly the machine from either seat. Two or three passengers sat on a bench seat at the rear of the cabin. An electric starter operated from the cockpit, Fairey metal airscrew, night and blind flying equipment made the machine a suitable mount for the touring private owner.

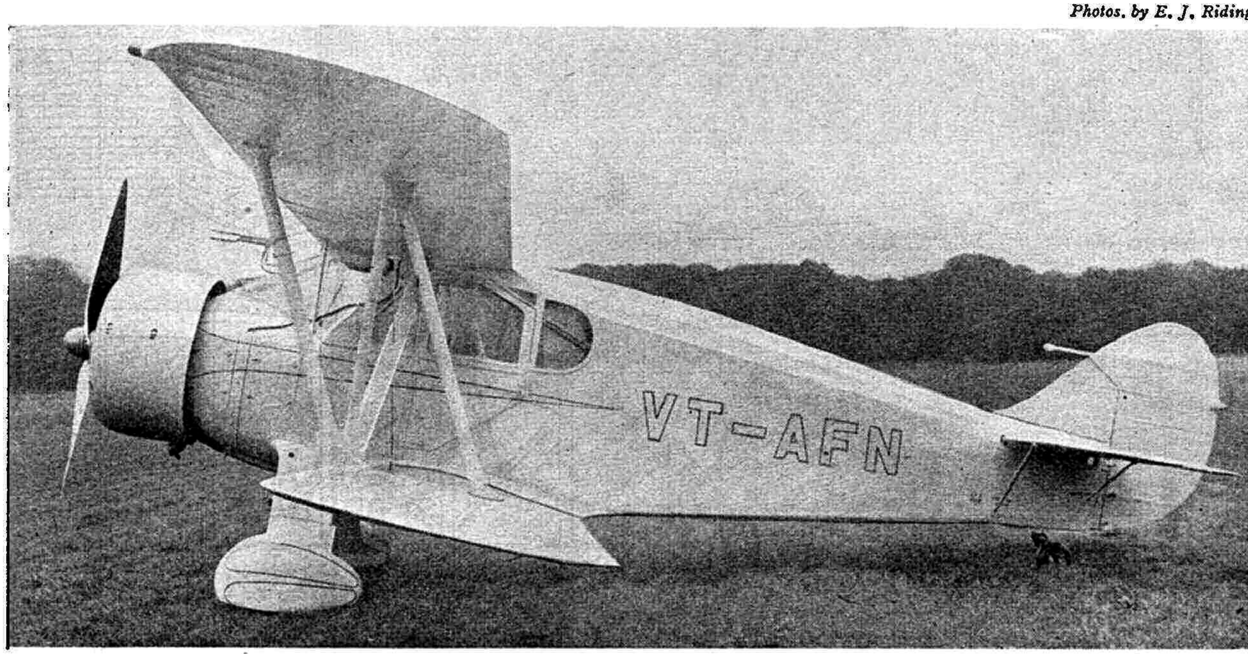
The power plant was the 215 h.p. 7-cylinder air-cooled radial Armstrong-Siddeley "Lynx IVc," and with 50 gallons of fuel carried in a pair of gravity wing tanks, the range in still air was just on 500 miles.

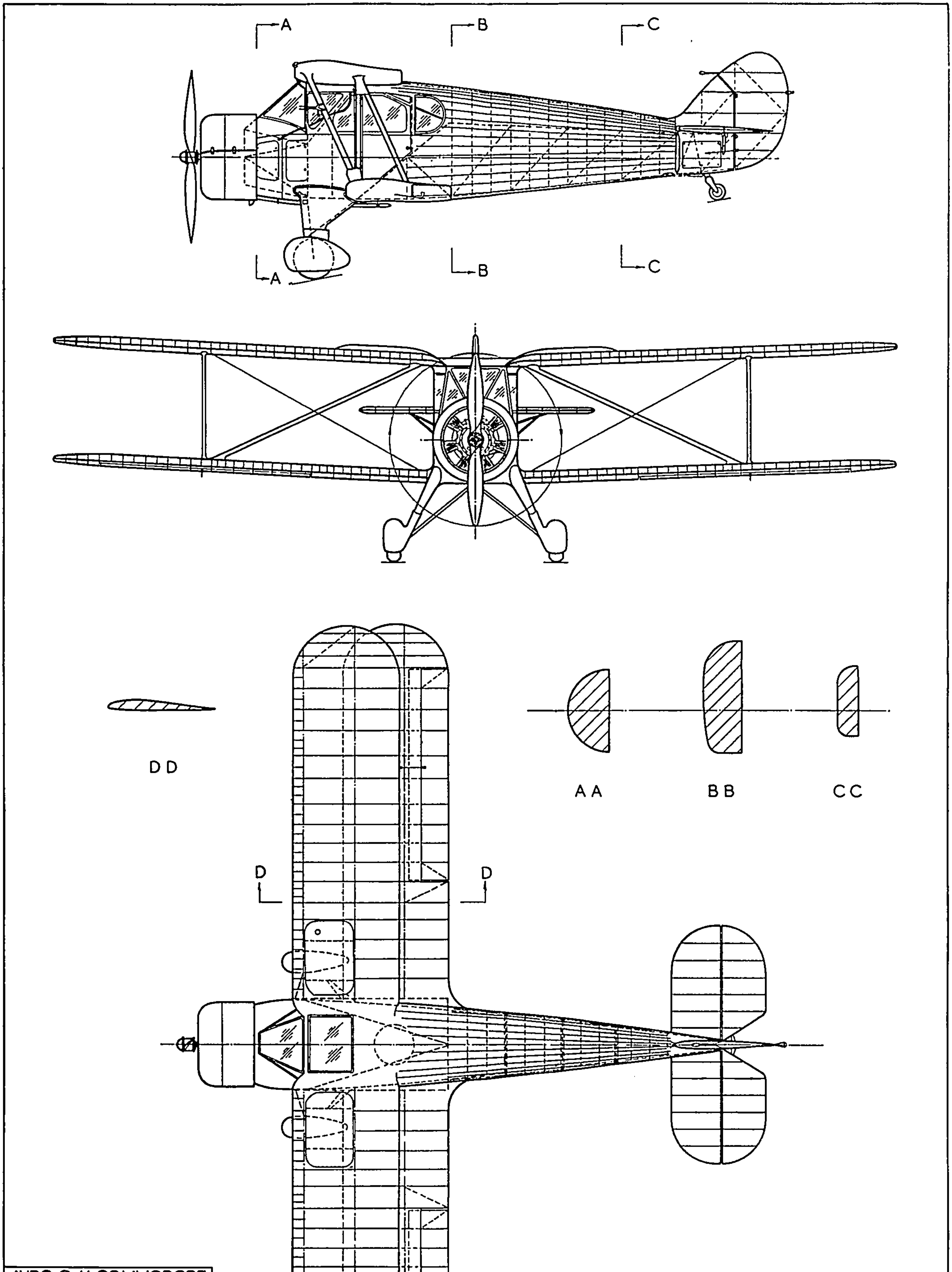
A few notes regarding colour schemes. G-ACNT was painted as follows :—Fuselage grey with red registration letters, struts, etc. Wings and tail surfaces aluminium.
G-ACUA :—White fuselage with green letters. Wings and tail surfaces aluminium.

Two Avro "Commodores," G-ACUG and G-ACZB, were still in service at the outbreak of War. The former was owned by Maj. J. E. D. Shaw, and the latter by Messrs. Armstrong-Whitworth Aircraft, Ltd.

Specification : Length, 27 ft. 3 in. ; span, 37 ft. 4 in. ; height, 10 ft. 0 in. ; wing area, 307 sq. ft. ; tare weight, 2,225 lb. ; loaded weight, 3,500 lb. ; ceiling, 11,500 ft. ; speed, max., 130 m.p.h. ; cruising, 110 m.p.h. ; landing, 50 m.p.h. Price, £1,995.

Photos. by E. J. Riding.





AVRO 641 COMMODORE

ANGLE OF ATTACK

BY SGT. FRANK ZAIC

This article, by America's leading model aeronautical expert, should be of great interest to both bodies of opinion in the "theory versus practice" controversy, in that it helps to bring the two closer together. It has long been known to the theorists that the calculated angle of incidence for the maximum value of the power factor of a model is almost invariably high, usually round about six to ten degrees. Now a practical modeller has proved by practical means that they are right, in this respect at least. It would seem that our policy of insisting that the two should progress together, to the mutual benefit of each, has had another vindication.—ED.

MANY years ago I was convinced that with few exceptions all models fly close to the stalling angle. Since that time I have tried to prove the fact by logic and recording instruments.

Let's take the logic proof first. When testing and adjusting a model, we automatically try to achieve slowest descent or glide. After we have made the necessary adjustments to obtain this, we find that only a *slight* adjustment towards slower glide is necessary to result in a stall. From this demonstration we can logically draw the conclusion that the model was flying very close to the stalling angle before the slight readjustment was made.

About two and a half years ago, just before coming into the Air Force, I made several angle-of-attack recorders which were fixed to the test model. At first I was anxious to obtain a continuous record through the entire flight, but found that there was too much friction, slight as it actually was, between the vane and the recording stylus. The final recorder design was very simple yet accurate, but it had the disadvantage of making only one record per flight. However, by synchronising a stop watch with the timer action, the moment at which the recorder acted could be observed from the ground. See the drawing for details.

The balanced vane is very sensitive to airflow and it is locked in position at the predetermined time by a trigger-actuated arm. The timer is set to operate the trigger while the model is in the most favourable testing position. The only way that this can be done is to make test flights and then time the moment at which the model seems to be flying at its best and set the operating timer accordingly. By making several tests, the average angle of attack will be found. By measuring the distances from the locked vane ends to some predetermined points on the model, sufficient data will be found to find the angle of attack by using elementary trig.

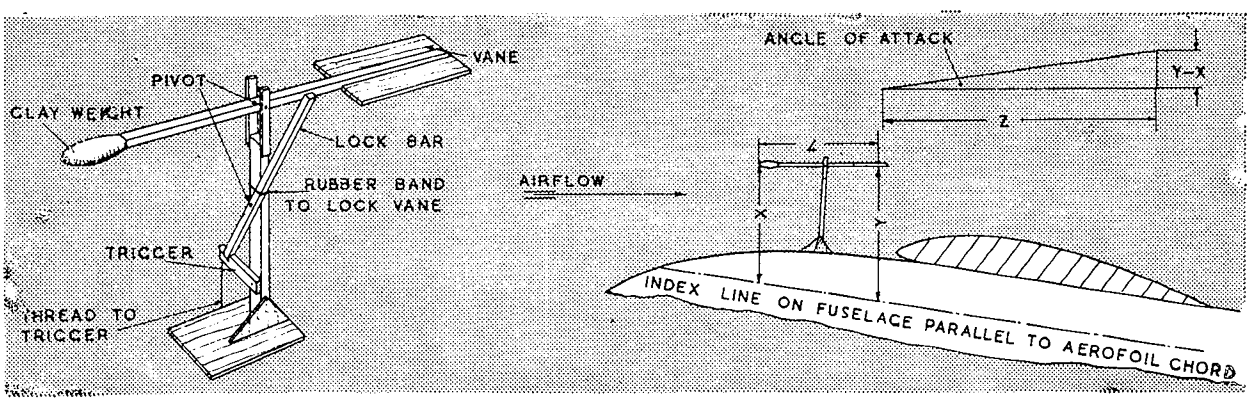
Time limited the use of the recorder to only one glider. This model had a span of 6 ft., wing area of 475 sq. ins., and a wing loading of 2 oz. per 100 sq. in. The angle of attack at which the glider gave best results, and which we would normally use, was recorded consistently between 5 to 6 degrees. A slight change in ballast to increase the duration or angle of attack caused a stall. It may, therefore, safely be said that this particular glider stalled at about 7 degrees.

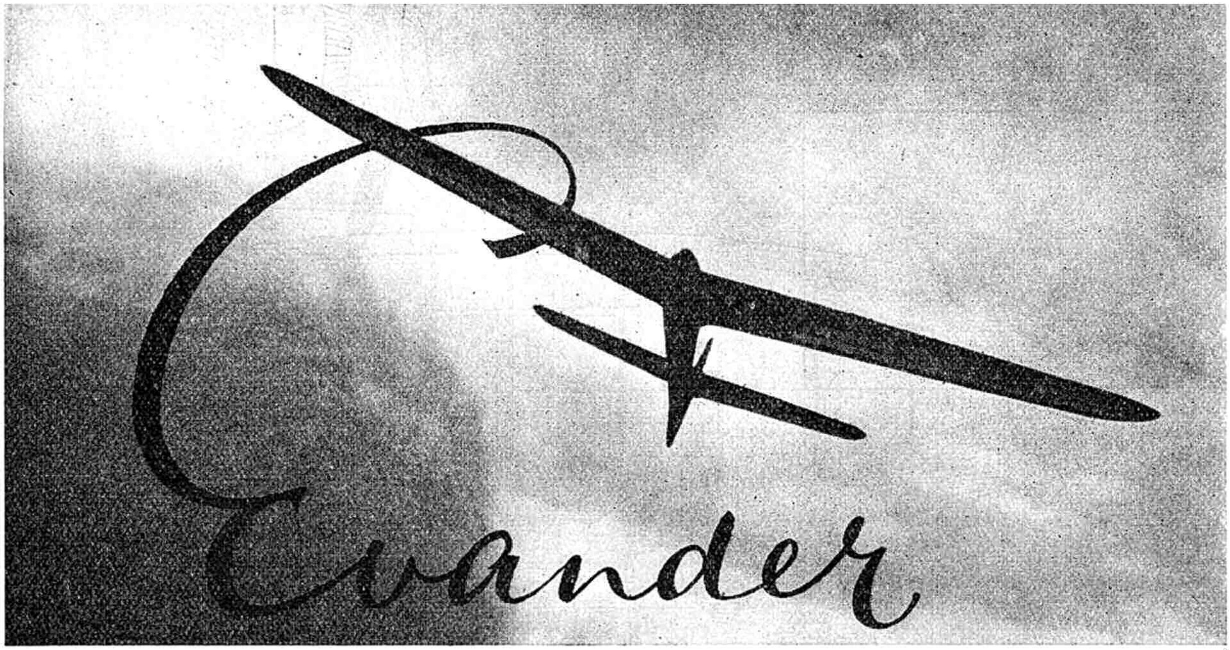
The aerofoil used was NACA 6409 with flat bottom. However, we should not blame this proven aerofoil for this particular low stalling angle. The light wing loading of 2 oz. per 100 sq. in. caused the glider to glide slow, under 10 miles per hour. As we know, speed has a great deal to do with the stalling angle. A stall will occur much sooner at low speed than at high. At 100 m.p.h. the stall may begin at 15 degrees, but under 15 m.p.h. it may start at less than 10 degrees. You can see this for yourself by checking a characteristic chart of an aerofoil that was tested at a different Reynolds number.

The wing loading is a fair indicator of the stalling angle, not forgetting the size or scale effect. Wings having a loading of 2 oz. per 100 sq. in. might stall between 7 and 8 degrees; 3 oz. per 100 sq. in. at about 9 and 10 degrees; while heavier loading might increase the angle to 12 degrees. It should be understood that these figures are just our own estimations and that they are based on the fact that an increase in wing loading will speed up the model and thereby increase the angular range.

There is no need to tell you about the value of knowing the angle of attack of a particular design we are contemplating. We could arrange the relationship between the wing and the fuselage so that there would be a minimum of drag which is now caused by having the fuselage move at an angle to the airstream. But at the moment we are not concerned about changes in design. The important point is to realise that all of us have for years been automatically adjusting models to fly close to the stall to obtain maximum duration without changing the design to suit the conditions.

In closing, it may be mentioned that as far as the relationship between the wing and stabiliser is concerned, nothing is changed. Their difference in angles should still be kept at 2 degrees or whatever you have found best. This means, for example, that if utmost efficiency is desired on a 2 oz. per 100 sq. in. design, the wing should have an incidence of 6 degrees and the stabiliser 4 degrees.





DESIGNED BY D · R · MURRIN

THE Evander is a sailplane of extremely pleasing shape. It looks right, and to quote an old aeromodelling maxim, most things that look right invariably *are* right! The model follows the latest trend of sailplane design, incorporating a shoulder wing, high tailplane, and a streamline aerofoil section fuselage. This latter feature gives the Evander a character and grace of its own.

The AEROMODELLER Staff conducted slope-soaring tests with the model, and were greatly impressed with its performance in view of the prevailing weather conditions. Stability was excellent. Gusty weather, with all the usual turbulence experience on hillsides, is a stringent test for any model in this direction, and the Evander came through with flying colours.

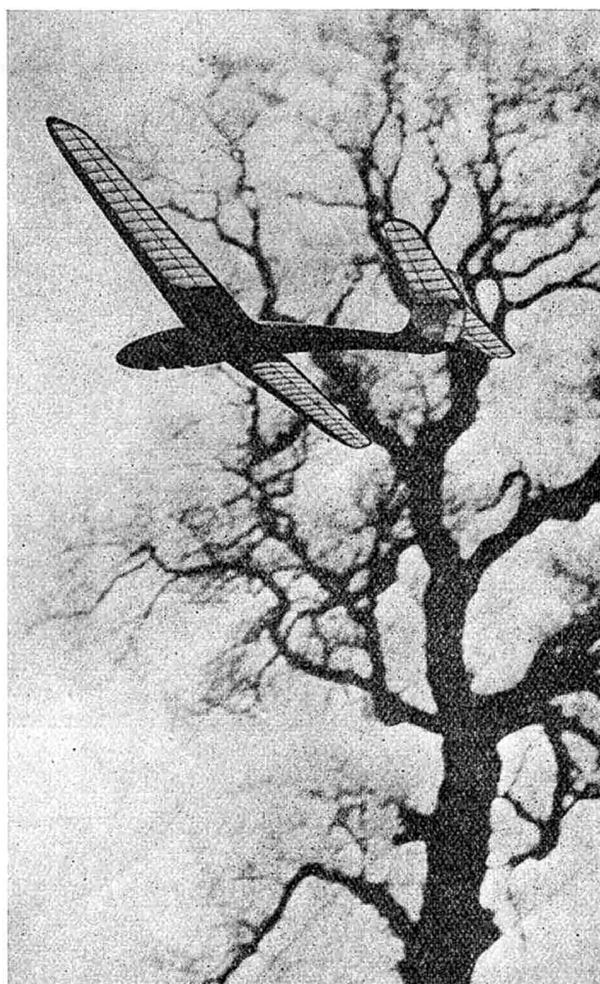
Flights of 200 to 300 yards were all that conditions would allow. These distances were covered in a fast glide with hardly any perceptible loss in height (the sinking speed is approximately 1·5 ft. per sec.).

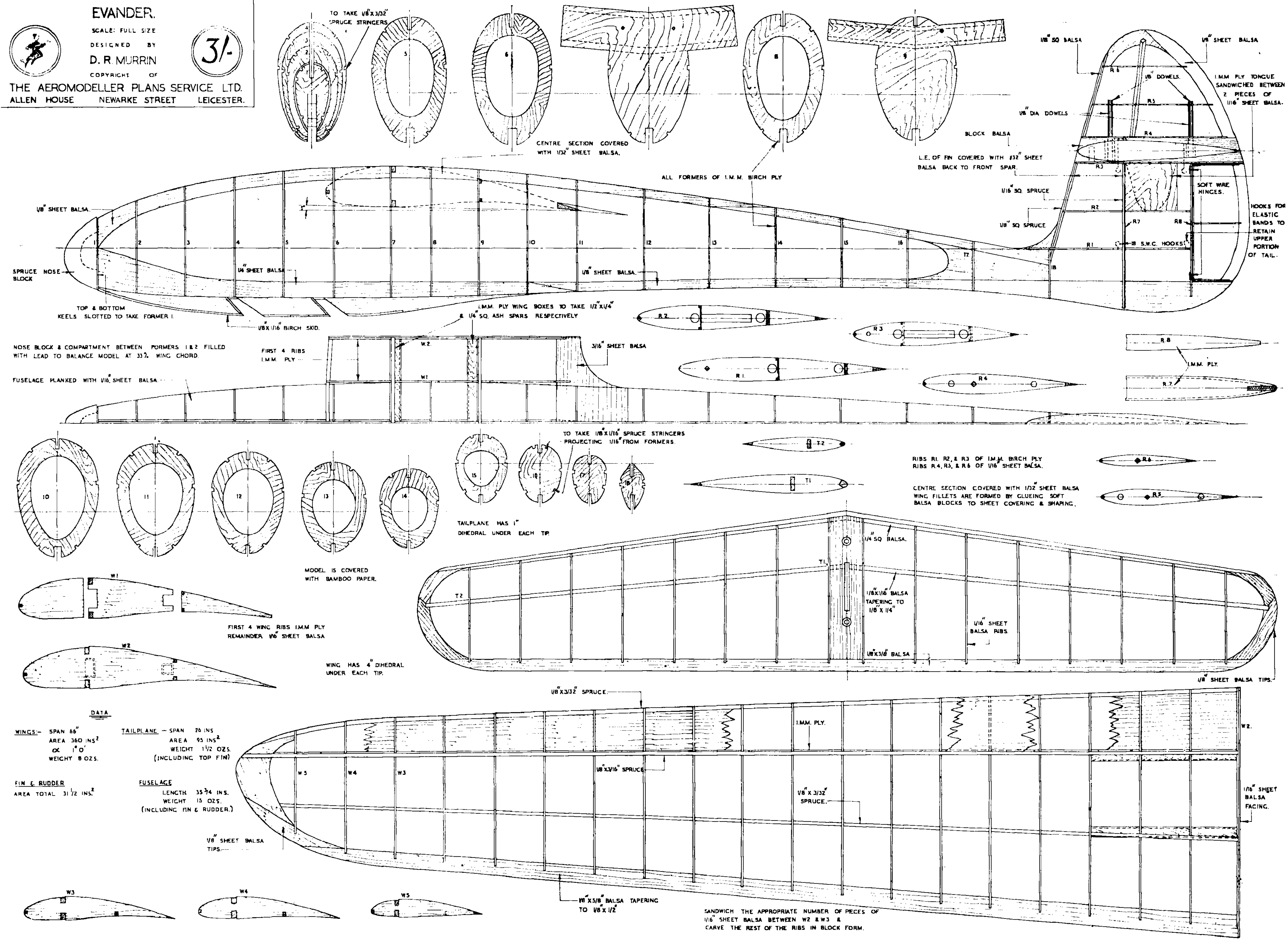
This model is not for the lightweight enthusiast, having a wing loading of 10 ozs. per sq. ft., but it proves beyond doubt the soaring capabilities of a well-designed heavyweight sailplane. It is worthy of note that during the test one rather too enthusiastic hand launch from half-way down the hillside resulted in the model clearing the hill and travelling a distance of some half a mile before landing in an allotment, which speaks well for Evander's performance.

The model, of orthodox construction, is comparatively easy to build and should be well within the capabilities of the average aeromodeller, providing he follows carefully the building instructions given on the plan.

The colour scheme on the original model was a red fuselage with white flying surfaces, the photograph on the right clearly showing the placing of the colours.

For the enthusiast who requires a high performance sailplane with real soaring capabilities, that can also take hard knocks without detrimental results, we fully recommend the Evander.





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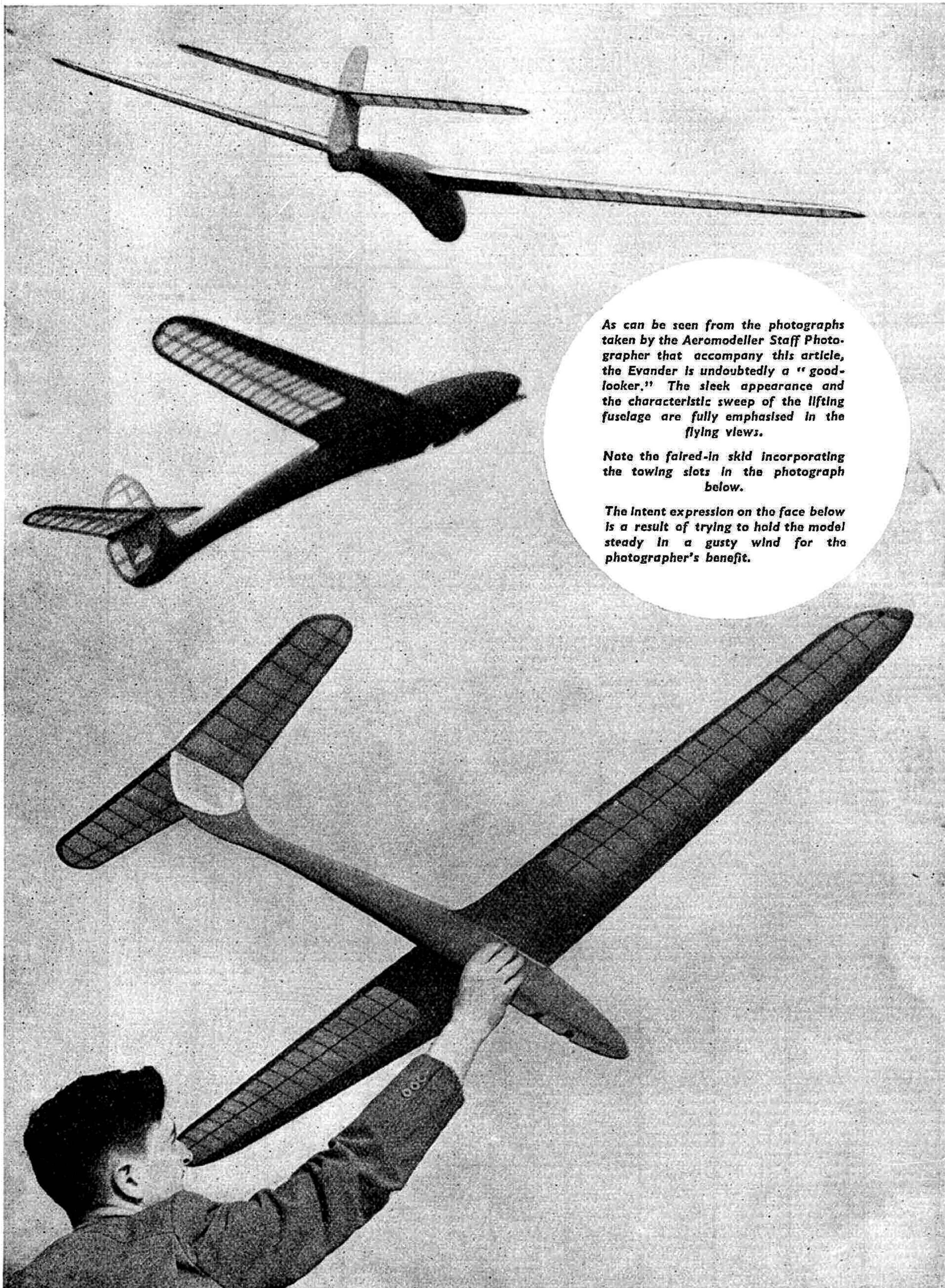
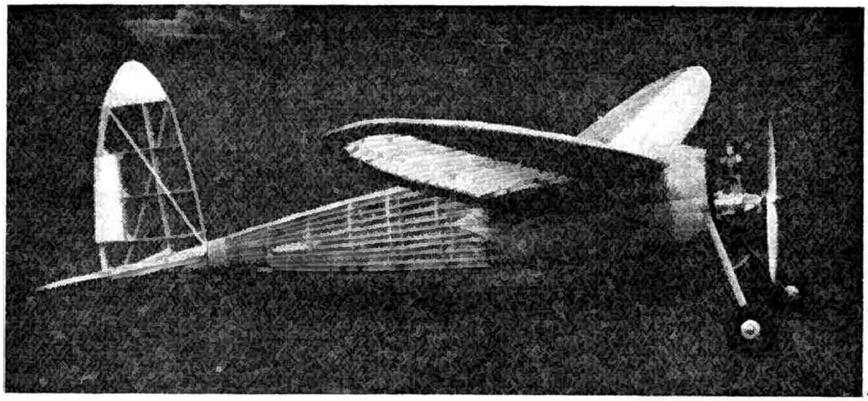


As can be seen from the photographs taken by the Aeromodeller Staff Photographer that accompany this article, the Evander is undoubtedly a "good-looker." The sleek appearance and the characteristic sweep of the lifting fuselage are fully emphasised in the flying views.

Note the faired-in skid incorporating the towing slots in the photograph below.

The intent expression on the face below is a result of trying to hold the model steady in a gusty wind for the photographer's benefit.



PETROL TOPICS

BY

DR. J · F · P · FORSTER

LAST month the main parts of 2-stroke engines of almost any make and the way in which they work and produce rotary power to the " prop. shaft " were discussed for the benefit of any unashamedly ignorant newcomers to the ranks of " Petroleers," like the correspondent who asked for this " return to beginnings." Nowadays even the *very* young seem to be born with a mechanical sense, and there must be very few boys of 14 who can have learnt much that they did not already know from last month's dissertation.

This month I propose to deal with the carburation and ignition systems of Model Aero engines, and I hope that some, at least, of what follows may prove not altogether lacking in interest to what I take to be my more regular and experienced readers ! The operation and maintenance of engines in good working fettle is concerned almost entirely with these systems ; the parts of the engine discussed last month requiring little or no day to day attention or adjustment, only see the light of day at rare intervals, if ever, before the engine is showing signs of serious wear and tear. This is usually first brought to one's notice by oil oozing from the front of the crankshaft bearing, and apart from the obvious inference that this indicates increasing wear of the main bearing so that the shaft can be rocked up and down to a greater or lesser extent, trouble may begin to be experienced by this oil finding its way on to the make and break points of the contact breaker, resulting in difficulty in starting due to a poor or irregular spark.

In order to produce a spark at the plug points, a small ignition coil weighing anything from 1¾–4 ounces is used. The larger coils usually require 4 volts for satisfactory operation, provided by a battery or miniature accumulator weighing usually from 3–4 ounces. These coils *will* operate on 3 volts, but very large capacity and heavy batteries are required as a rule, and in the end the total weight of ignition equipment comes out heavier trying to use 3 volts than 4 volts. More recently very much smaller and lighter coils have been specially developed for use with the very tiny engines such as Super Atoms, and these do definitely operate very efficiently on 3 volts even from such small cells as those in a single " penlite " battery. Indeed, these coils are very sensitive to " overdosage," and overheat in a few seconds on 6 volts, and even 4 volts for any length of time may result in damage. Since the ordinary acid accumulator gives 2 volts per cell, it is not practicable to get 3 volts from them unless we use a series resistance which, if it is to pass the necessary *current* to operate the coil, is likely to be heavy and defeat our weight saving efforts. Using these very light coils I have recently had to revert to the use of dry batteries which, compared with my usual practice of using home-made mini-accumulators, is expensive, as " penlite " batteries do not last long. What we need is a coil which *will really work* on 2 volts, and then we can use single celled mini-accumulators, and the maiden's prayer will then be answered once and for all ! !

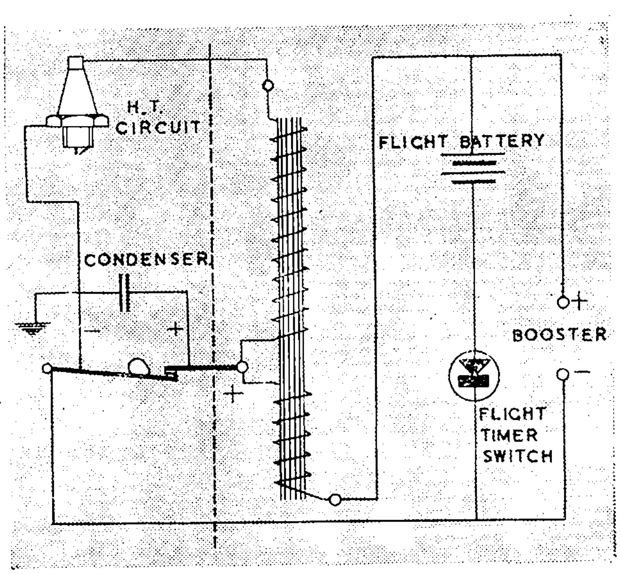
However, all this is largely academic, and only seriously concerns the super lightweight enthusiast. The ordinary " old reliable " coil of the deservedly famous American " Firecracker " type, operates, while flying, on 4 volts, and will stand lots of abuse including 6 volts for minutes on end, which is a great advantage to the mini-accumulator user, as he can start up his engine while boosting his accumulator from a 6 volt outside source, and leave it on charge right up to the moment of take off, when he pulls out the booster plugs. If his flight timer has not been set going, his engine will automatically cut out on disconnecting the booster plugs. This not only serves as a safety measure but also reminds him that he has not been charging either ! ! In order to charge it is necessary to set the flight timer going. Before doing this it is, of course, important to make sure that the contact breaker points are open. If closed, the booster current will pass continuously through the coil and result in serious overheating.

The coil produces a high tension spark from its secondary winding to any earthed object or point in the L.T. circuit whenever this circuit is suddenly broken, and of course when connected to the plug causes it to spark. The repeated make and break action is performed once each revolution by means of a cam placed either on the shaft itself just behind the prop. driving washer, or on the rear face of the driving washer itself. According to the design of contact breaker, this either makes or breaks contact between tungsten or platinum contact points by moving one of the two points mounted on a spring-loaded rocker arm. One point, usually the moving contact, is earthed, i.e., is in metallic contact with the engine frame, while the other point is fixed and is electrically insulated from the engine. It is not necessary or desirable for the points to be in contact for longer than a very small proportion of each revolution, as this makes an unnecessary drain on the battery and leads to undue heating of the coil. At very high speeds, however, the spring-loading of the rocker arm must be quite powerful, and the weight, and therefore inertia, of the arm must be light in order to ensure that the arm will return and make contact before the cam comes round again, perhaps as fast as 10,000 times per minute ! A small 0·1 mfd. condenser across the contacts prevents undue sparking and burning of the points and helps to build up the charge induced in the coil.

The timing of the spark is, of course, vital, and should occur either at or just after top dead centre when the gas is fully compressed by the piston into the cylinder head. Practically all modern engines have adjustable ignition timing, and this forms the only control of engine speed on most model aero 2-stroke engines. Advancing the spark means rotating the breaker assembly around the crankshaft bearing so that the spark occurs at the plug earlier in each firing stroke. There is, of course, a limit to this, for if the explosion starts too soon before the piston has reached top dead centre, a back fire will occur and the shaft will revolve the wrong way.

It would take too long to attempt to describe in an article of this sort all the numerous designs of contact breaker seen on commercially produced engines. Some are quite open while others are enclosed. Some are closed by the cam and opened by the spring while others are opened by the cam and closed by the spring. In my experience some of the crudest types worked more reliably than types with separate rocker arms and spring loading. In the type I have in mind, there is no rocker arm in the true sense of the word, the moving contact being riveted to a strip of phosphor bronze which forms the arm and spring in one piece. Adjustment of this type is very easy and they are, of course, readily accessible. In the enclosed types, it is usually necessary to remove the prop. and its driving washer to gain access to the enclosed assembly for any adjustment or cleaning of the contact points, and on the whole little seems to be gained except in appearance, in enclosing contact breakers in this way.

Before passing on, it is worth mentioning to the novice that although, as mentioned already, adjustable ignition timing provides us with the only control we have on engine speed on most pre-war 2-strokes, in point of fact it must not be assumed that we have in the spark timing lever a substitute for a throttle lever. Unfortunately the types of engine in common use are not



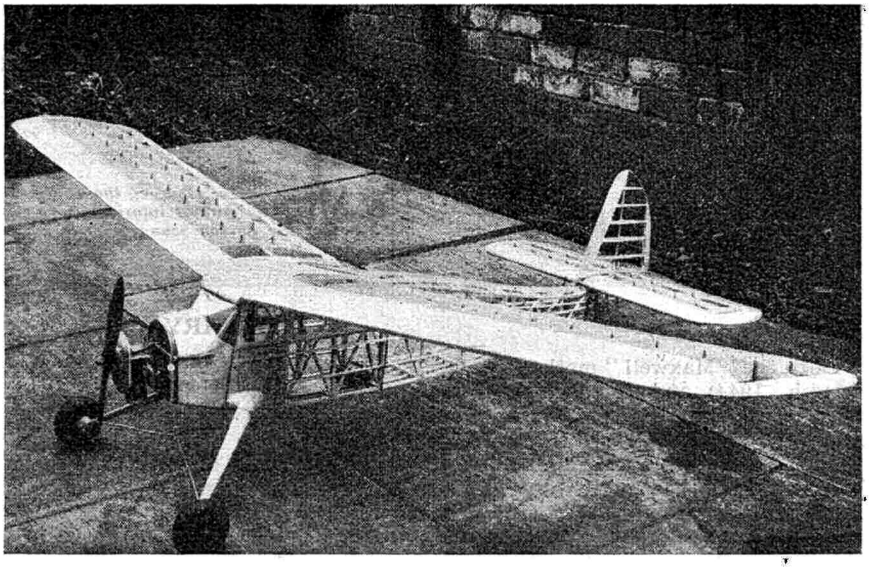
strictly controllable except by careful readjustment of the carburation system to suit the altered conditions due to advancing or retarding the spark timing.

The carburation system in common use does not comprise a throttle between the fuel jet and the engine, and the diameter of the intake pipe has to remain the same at all engine speeds. The result is that the petrol/air ratio of the mixture sucked into the engine varies with the speed of the engine. If an engine is properly adjusted to continue running with the ignition timing fully advanced, we usually find that if we suddenly retard the spark, the engine will slow down and continue to run quite nicely and fire evenly for perhaps as long as 20–30 seconds, but gradually the exhaust note will begin to change in character, usually becoming "thinner" and higher in pitch, and finally with a few perfunctory and irregular explosions will peter out and stop. The reason for this is that when the engine slows up, the speed of induced air past the jet or needle valve is also reduced, and on most modern engines with suction fuel feed, the partial vacuum or venturi action at the jet is reduced disproportionately to the reduction in engine speed. Consequently less fuel is sucked from the jet and the strength of the petrol/air mixture gradually becomes less The mixture is then termed " weak " and an engine will not continue to run for long under these conditions. Consequently, if we wish to slow down an engine and for it to keep running evenly after we have done so, we find that it is necessary to *open* the needle valve which controls the flow of fuel through the jet a trifle, to compensate for the slower revolutions, and it may take several seconds, perhaps as much as half a minute, to readjust the needle valve to the critical position to suit the new engine speed and maintain true 2-stroking conditions.

Conversely, if, having at last got everything adjusted nicely for slow running, we suddenly advance the ignition timing, the revs. immediately increase and all may seem well for perhaps half a minute. Unfortunately, with the tremendous increase in speed of the air past the jet much more fuel than is necessary is sucked from the jet, and unless we " do something about it " by closing the needle valve a trifle, we find that the engine suddenly begins to " four-stroke," i.e., the explosions occur every other revolution instead of every revolution. The mixture begins to become too rich, and clouds of blue smoke become apparent in the slip stream, finally 8-stroking or worse occur, and the engine peters out with a flooded crankcase.

Imagine this process occurring on the flying field :— With the engine ticking over nice and steadily, we " give her the gun " by advancing the spark only, release the model and away she goes. Then just as things seem nicely set for a good flight, power begins to fail, misfiring commences, and the engine peters out long before it was intended to do, and the general feeling is one of anti-climax ! ! It is essential after any readjustment of the spark timing to let the engine run for at least ¼ minute and to ensure that the correct setting of the needle valve has been obtained to suit the spark timing.

The induction system on most engines hitherto in common use simply consists of an intake tube of uniform internal diameter throughout its length. Occasionally a constriction occurs at the site of the jet, but usually the venturi effect is obtained simply by the reduction in cross-sectional area resulting from the needle valve



passing through the induction pipe at right angles to the airflow. Except on the Super Atom, which has a fixed jet, the jet simply consists of a small hole drilled in the side of this fuel pipe, and the flow of fuel from this hole is adjusted by a tapered needle threaded with a fine thread within the fuel pipe. Screwing the needle up gradually closes the fuel pipe as the taper approaches its seating, and unscrewing it opens "the tap" and results in a richer "petrol/air" ratio.

In order to start an engine in which the fuel lies at a lower level than that of the needle valve (i.e., suction feed) it is necessary to choke the intake tube altogether for a few flicks of the propeller in order to produce a semi-vacuum in the intake tube and so suck liquid fuel from the jet. Many engines require their induction pipes to be semi-flooded in order to start, because at the low speeds resulting from hand starting, the intake draught is insufficient to *atomise* fuel as it is sucked from the jet, and the only way of getting the petrol/air ratio rich enough to form an explosive mixture is to rely on evaporation which can only take place on a sufficient scale by allowing a considerable excess of *liquid* fuel to enter the crankcase. Once the engine fires a few times, the rush of air past the jet is sufficient to atomise the small amount of fuel sucked from the jet by venturi action, and these finely divided droplets of fuel rapidly vapourise, and by the time they have been transferred from crankcase to cylinder, the petrol/air mixture is practically a uniform vapour, and any liquid droplets remaining consist of lubricating oil. Because of the excess fuel lying in the induction pipe and crankcase, engines usually start off 4-stroking, but after a few seconds the excess fuel is cleared, and if the needle valve is properly adjusted, they soon settle down to an even 2-stroking purr—music to the ear of every petroleer!

Lubrication of these engines, many of which develop very high operating temperatures within half a minute of starting from dead cold, is, economically speaking, highly inefficient. Oil is mixed with the fuel in the ratio of 1 to 3 or 4 parts of petrol, and probably 80–90 per cent. of it is discharged through the exhaust port; 10 per cent. is burnt up with the fuel and forms the blue exhaust smoke—bane of most petroleers' wives; 5 per cent. leaks through the main bearing of any but the newest of new engines, and the rest may probably perform its true function of lubricating and preventing undue heating of moving surfaces and the vital one of maintaining as high a degree of gas-tight sealing of piston and crankcase as possible. Owing to the closed crankcase of 2-stroke engines, the pulsing pressure within it tends to pump oil along the main bearing, and in most engines an oil groove is cut in this bearing to within ½ in. or so of its front end. It is therefore practically impossible to maintain perfect lubrication of the whole length of the crankshaft bearing without a very slight leakage of oil from its front end. This tends to get thrown out by centrifugal force, and in many earlier designs of engine the contact breaker points were so placed as to receive the full brunt of this "oil shower."

Good news comes from America that production on a very small scale of one or two well known makes of engine has now been authorised, but I fear it may be some time before they will be available over here. Now is the golden opportunity for manufacturers with sound designs to put some worthwhile British engines on the market at a reasonable price. I hope we shall not have to wait much longer to see and try these engines, and to see the petrol game get really cracking in this country.

Heading photo this month comes from C. J. Walder of Oxford, and shows his rather pretty 6 ft. elliptical-wing multi-stringer job with shoulder position for the wing and the curious shaped fin. We all have our own pet ideas about fin shapes, but personally I think that fin is rather a pity! Note the semi-monococque planking with battery hatch below the centre point of the wing chord, and the practical, if not very pretty, undercart. The engine is a Ken Kestrel of 6 c.c.'s machined by a friend of his, which he says took 3 months to start!! Is this a record?!! The model is graced with the name of "Slummicky Ann IV." He adds that it is largely a crib of a model in one of Zaic's Year Books, so maybe he's not to blame for that fin!

Photo above shows a very robust looking slabsider of which I received no details from its builder, E. S. Bassett, of Doncaster, but which, if my guess is correct, is powered with an inverted Cyclone on a knock-off mounting. I wonder how that undercart works and whether those nice-looking flares into the fuselage are fixed to the leg or the fuselage, or could they be rubber mouldings? It would be nice to have these obtainable after the war in various sizes. The wing and stabiliser, if he will excuse my saying so, have 2 spars too many. With a skin-stressed compound box L.E. spar, those other spars are quite unnecessary with silk covering, and being slotted through the ribs only weaken the latter. If that is a Cyclone engine the span must be somewhere around 6 ft. Nice work Mr. Bassett. As I've said before, it is high time we saw some ACTION pictures, or at least some pictures of *finished* models which *look* as if they have flown and come down in one piece!! Go to it chaps and let us have your prints: LARGE, BLACK AND WHITE and GLOSSY.

COUNTERACTING THE EFFECTS OF ENGINE FAILURE IN TWIN-ENGINED MODEL AIRCRAFT

BY N. K. WALKER, B.Sc.

Pt. I. *In view of the complexity of the calculations involved, the Author informs us he will gladly work out the necessary figures for any person who cares to experiment with an offset-engined model.*

SUMMARY.

Both the "Maxwell" method of off-setting the engine (March, 1944) and the "Burns" method of toed-in twin fins (September, 1943), will overcome the turning moment due to unbalanced thrust in twin-engined models though the fin area required may be rather large.

A static test as suggested by Dr. Forster (September, 1943) will require roughly twice as much fin area for balance as in free flight in the case of a petrol model and three or four times as much in the case of a rubber model. Used in conjunction with a theoretical conversion factor this test will, however, give the most accurate possible estimate of the necessary fin area.

The turning effect of the thrust will be almost exactly balanced for all throttle settings as long as the speed of the model does not vary greatly, *i.e.* under all conditions of flight except the take off, where a certain amount of swerve can be expected.

Torque effects can be readily controlled but the engine will need to be off-set if banked flight is to be prevented. In most cases the torque effects alone can control the thrust moment completely, and must always be allowed for.

SECTION ONE.

(A) The "Burns" method.

It was suggested by Mr. Burns (September, 1943) that toed-in twin fins placed in the slipstream could counteract the yawing moment produced by engine failure, the added yawing moment due to the remaining slipstream equalising the thrust moment of the airscrew.

According to Glauert (Airfoil and Airscrew theory), the slipstream velocity after contraction is given by :—

(1) $v = 2aV$ where V is the air speed,

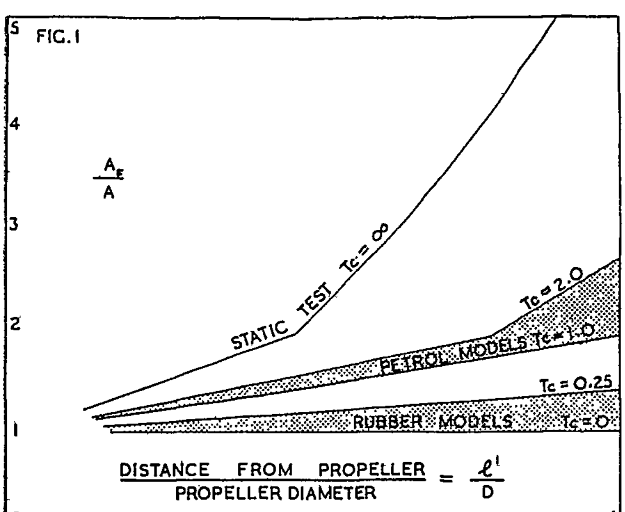
(2) and if $T_c = \dfrac{\text{Thrust (in lbs.)}}{\rho V^2 D^2}$ where

D = airscrew dia. in feet. ρ = air density = 0·002378.

(3) $$1 + 2a \doteq \sqrt{1 + 8/\pi\, T_c}$$

The total airspeed over the fin is

$$V + v = V(1 + 2a)$$



and the total fin force "F."

(4) $$F = \tfrac{1}{2}\rho S^1 C_L (V + v)^2$$

where S^1 = fin area and C_L = lift coefficient of fin considered as a wing.

$$F = \tfrac{1}{2}\rho V^2 S^1 C_L (1 + 2a)^2$$

(5) $$= \tfrac{1}{2}\rho V^2 S^1 C_L + \tfrac{1}{2}\rho V^2 S^1 C_L \times 8/\pi\, T_c \text{ from (3).}$$

The first term is due to the ordinary airflow and is balanced by a similar force on the opposite fin, but the second term is entirely due to the slipstream.

But $T_c = \dfrac{T}{\rho V^2 D^2}$ from (2)

and $D^2 = 4/\pi\, A$ where A = propeller disc area.

$$\text{So F (due to slipstream)} = \tfrac{1}{2}\rho V^2 S^1 C_L \times 8/\pi \times \frac{\pi T}{4\rho V^2 A}$$

(6) $$= \frac{C_L S^1 T}{A}$$

This force must balance the thrust moment, so if "d" and "l" are the moment arms of the propeller and the fin respectively,

$$Td = \frac{S^1 C_L T l}{A}$$

(7) $$\text{or } S^1 = \frac{Ad}{C_L l}$$

This equation is independent of the thrust and can be proved to hold even for static conditions, so that a balance, once obtained, will hold under all conditions of throttle.

The effect of the mixing of the slipstream with the air.

The preceding assumptions are based on Glauert's theoretical slipstream which leaves the propeller at an area " A " immediately contracts to an area " A^1 " and is cylindrical thereafter.

In practice we know that air is continually drawn in and mixed with the slipstream whose cross-section therefore increases continually, while its velocity decreases, but we can assume that there is no change of momentum down the stream or that, if " A_F " is the cross-sectional area of the slipstream at the fin,

(8) $A^1 \times$ theoretical increase in " V^2 " $= A_F \times$ actual increase in " V^2 " at the fin.

In (5) we found that the force was proportional to the theoretical increase in V^2.

∴ We must now replace this by the practical increase, from (8) and we have

(9) $$S^1 = \frac{Ad}{C_L l} \times \frac{A_F}{A^1} \quad \text{or}$$

(10) $$S^1/A_F = d/l \times 1/C_L \times A/A^1$$

S^1/A_F is the proportion of the slipstream at the fin which must be " captured " by the fin. Obviously this cannot exceed 100 per cent., so *if the right-hand side of equation* (10) *exceeds* 1·0, *balance is impossible and* C_L *or d/l* must be altered. In practice it would be unwise to attempt to capture more than 40 per cent. to 60 per cent. of the slipstream.

$A/A^1 = \frac{1+2a}{1+a}$ where " a " is given by equation (3) and depends only on Tc. This and other functions of Tc are set out below :—

Table 1.

Tc	$\frac{1+2a}{1+a} = A/A^1$	$\frac{1+2a}{2a}$	$\frac{1}{1+2a}$
0·0	1·00	∞	1·00
0·1	1·05	9·30	0·89
0·25	1·12	4·58	0·78
0·5	1·21	2·93	0·66
1·0	1·31	2·13	0·53
1·5	1·37	1·83	0·46
2·0	1·42	1·68	0·41
∞	2·00	0·0	0·0

Rough values of Tc are :—

Static test Tc = ∞
Petrol model Tc = 2·0—1·0
Rubber model Tc = 0·25—0·0

Equation (10) gives us S^1/A_F, and to find S^1 it is necessary to find the value of A_F at various distances from the propeller at various values of Tc. I measured the diameter of the jet of air from a powerful 10 in. fan at distances from the blades and the results are given in the following table :—

Table 2.

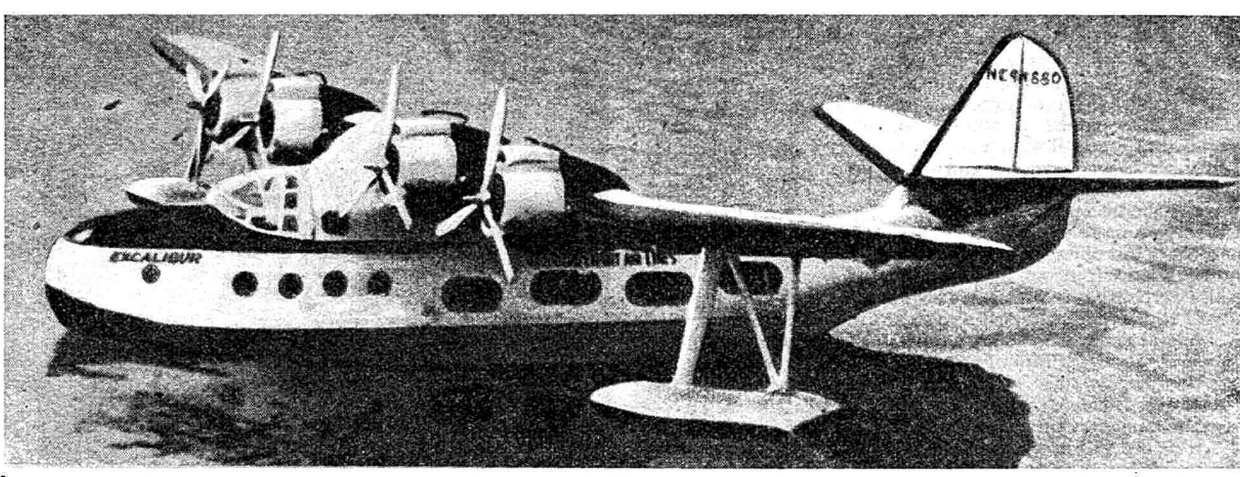
$l^1/D = \frac{\text{Distance from fan}}{\text{Diam. of fan.}}$	$\frac{\text{Slipstream Dia.}}{\text{Fan Dia.}}$	$\frac{\text{Slipstream Area}}{\text{Fan Disc Area}} = A_F/A$
0·9	1·1	1·21
2·3	1·3	1·69
3·5	1·6	2·56
4·1	1·8	3·24
5·0	2·1	4·41

These results will apply to all static tests, but *not* to flight tests.

We must now make the logical assumption that the shape of the slipstream relative to the air is almost unaffected by the behaviour of the propeller once it has left the disc. Consider a section across the slipstream. Then in one second this will have travelled a distance " v " from its original position and is area A_F can be found for the appropriate value of l^1/D namely v/D. Now the propeller will have moved forward a distance " V " so the total distance *from the propeller* will not be " v " as in the static case, but V+v so to get the shape of the slipstream when the 'plane is moving, multiply the values of l^1/D given in Table 2 by $\frac{v+V}{v}$ or $\frac{1+2a}{2a}$ (which is given in Table 1 for various values of Tc).

Fig. 1 gives values of A_F/A plotted against l^1/D for representative values of Tc.

(To be continued.)



Photo—" Model Airplane News."

This fine 12 ft. span model of the Sikorsky " Excalibur " is powered by four Forster 99 engines, and its builder, C. H. Grayson of Texas, U.S.A., intends to instal radio equipment when he can get it. Never having heard of the " Burns " method—or the " Maxwell " one either for that matter—the model can only fly on a control line at the moment. Nevertheless it is a fine example of the Aeromodeller's art, and we congratulate Mr. Grayson on bringing such an ambitious project to such a successful conclusion.

WORLD NEWS

America—40 m.p.h. Aero-Bike.

The most prominent trend in kit design at the moment is the use of jigs. Most flying model manufacturers now advertise their products as being built on jig, boom, or spar principles to effect accurate line up of the components. Solid model kits too, are mainly complete with ready cut templates for testing fuselage sections, etc. The price of kits in the United States varies considerably, but almost any example picked at random would shake modellers in this country. No English dealer would have much difficulty in getting rid of kits of a 6 ft. span sailplane for approximately 4s. 6d., which is the price at which they are offered in America!

Accepted masters of gross journalese, the Americans have their own particular brand when it comes to models. We fear, however, that the general feeling amongst British modellers would be one of mirth when confronted by an advert. for "Technicarved" solid models—"tailored in Balsa"! This amusement would probably increase on turning to an advertisement for—well, not quite a jet-propelled bike—but the next best thing! The blurb says: "Build your own Aero-Bike. Be the first to make your own propeller-driven motor-bike for the coming summer. Propeller mounted behind bicycle and run by any small gas engine pushes bicycle up to 40 miles per hour and 130 miles on a gallon of gas. Roars like a real airplane. Easy to make. 30 per cent. more efficient than direct hook-up to wheel." We will not enlarge upon the advertiser's claim for the vehicle's efficiency! With the weight of the engine over the back wheel, and the somewhat abusive quality of the airscrew when roused, we imagine the appearance of such a vehicle in public might have a shattering effect, both on the general public and the rider!

The Soviet Union—World Records.

Of the eighteen World Model Aircraft records (*sic*), thirteen belong to the Soviet Union (reports Tass). This announcement by Moscow Radio comes as a surprise, to say the least, as to our knowledge Russia did not compete in any international competitions before the war. The F.A.I. recognised *twenty-three* classes in 1939, and we should be very interested to hear which are the thirteen held by Russia.

Moscow followed up this rather doubtful statement with the news that before the war, the best models built by young Soviet designers flew as far as eighty-four and a half miles, and reached a ceiling of more than 13,000 ft. We feel sure that British modellers will join us in congratulating Soviet modellers on these fine achievements.

Readers may have noticed a small paragraph in some national newspapers a while ago, which remarked with wonder that a model with a rubber motor stayed in the air for twenty-six *whole minutes* during experiments in Russia! We were just about to pass on, when we noted that during this time the model reached a height of 7,600 ft., and covered a distance of more than four miles. We keep a slide rule operator in our office for statements such as this, so we handed him the report (put out by Moscow Radio by the way). His results were rather interesting, the first two being as follows:—

1. If the model possessed a motor run of 3 minutes, a very liberal amount (shades of LD^2 W^2!), it would still have to climb at the rate of nearly 49 ft./sec. in order to reach this height. He therefore estimates that the actual airspeed should approach something like 100 m.p.h.
2. If the machine had taken one second to reach 7,600 ft., it would still have to sink at the rate of 5 ft./sec. in order to reach the ground in time.

"Some crate!" we said.

Burma—Discovery of New Materials. (!)

Owing to complete lack of the usual materials, enthusiasts in S.E.A.C. have been forced to use some queer materials. Cpl. A. Stubbs writes that his first attempt was a stick glider made completely from bamboo, with the joints lashed together because glue was unobtainable. The model was covered with toilet paper, stuck on with condensed milk.

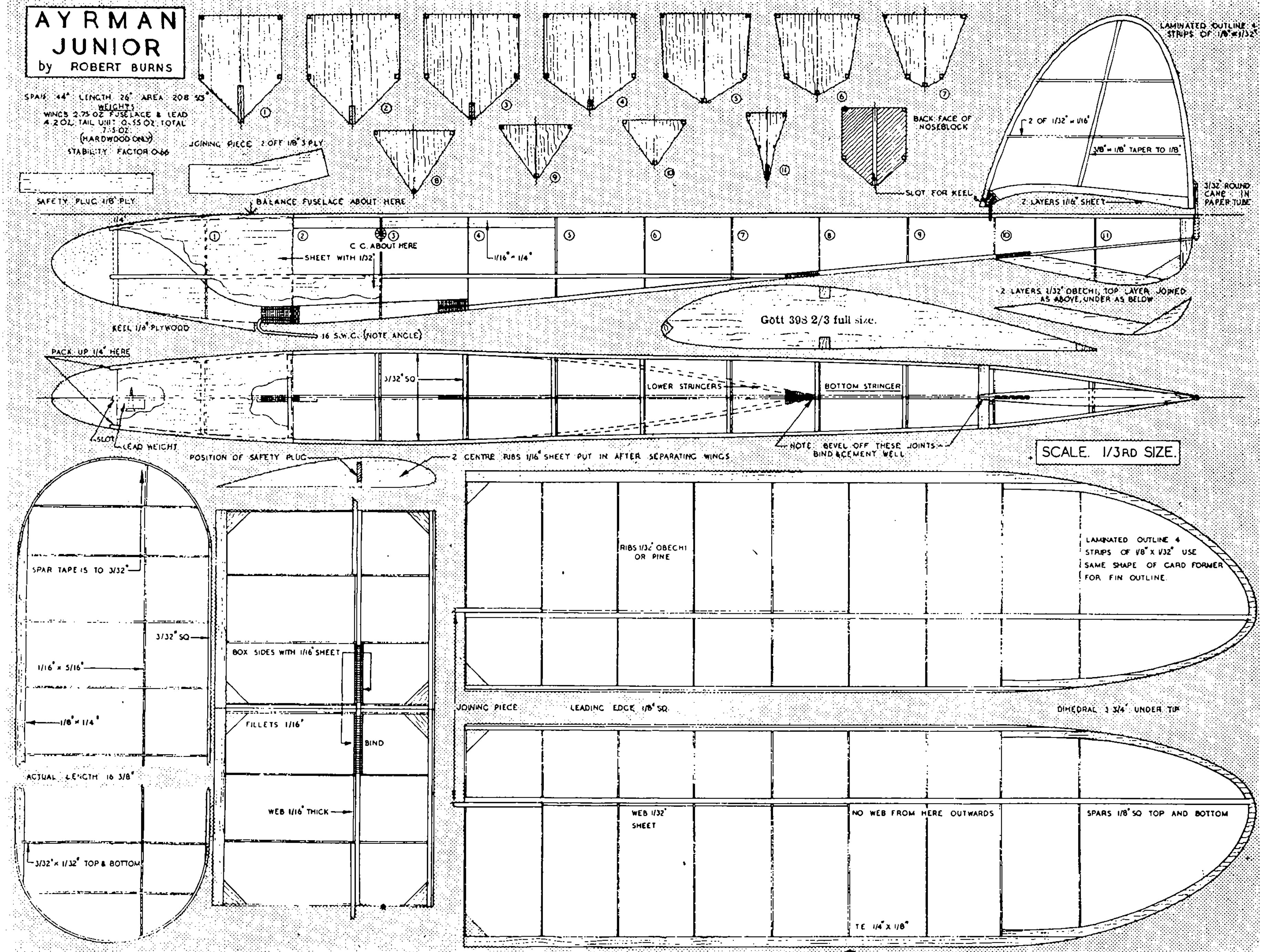
Mr. Stubbs and his friends later progressed to models in which plywood and glue played an appreciable part, whilst toilet paper was abandoned as being inferior to airmail paper or cigarette packet cellophane. When modellers are inclined to grumble, they might remember these splendid efforts.

Great Britain—Bristol's Effort.

For novelty and interest, a non-flying model aircraft recently seen by a member of the AEROMODELLER staff who visited the Bristol Aeroplane Company's works at Filton, would be hard to beat.

Impressive indeed was this model—a full-size "mock-up" in wood of the vast "Brabazon" class air-liner (Type 167) to accommodate 80 people as a "sleeper" and no fewer than 220 on short distances by day! It was a memorable experience to walk through the 18-ft. diameter fuselage with its cabins, buffet and cocktail bar, and crew quarters, look back from the cockpit window to the wing nearly 70 ft. distant, and peer through an air-lock (the fuselage will, of course, be pressurised), at the 6-ft. deep cat-walk through the wing to the eight completely concealed 2,500 h.p. Centaurus radials, coupled in pairs to six-bladed contra-rotating airscrews. The wing-span is to be 230 ft. (well over twice that of a Liberator), and the tail-plane span will equal that of a Spitfire wing.

***EMBRYO ENGINEER.** Photo shows Manuel Spencer, a bed-ridden American youngster in the Tulsa Hospital for crippled children, with a model he has constructed with the aid of engineers employed at the local Douglas Aircraft Co.'s plant.*


AYRMAN JUNIOR
by ROBERT BURNS
SPAN 44" LENGTH 26" AREA 208 SQ"
WEIGHTS
WINGS 2.75 OZ FUSELAGE & LEAD 4.2 OZ. TAIL UNIT 0.55 OZ. TOTAL 7.5 OZ.
(HARDWOOD ONLY)
STABILITY FACTOR 0.66
JOINING PIECE 2 OFF 1/8" 3 PLY
SAFETY PLUG 1/8" PLY
BALANCE FUSELAGE ABOUT HERE
BACK FACE OF NOSEBLOCK
SLOT FOR KEEL
LAMINATED OUTLINE 4 STRIPS OF 1/8" x 1/32"
2 OF 1/32" x 1/16"
3/8" x 1/8" TAPER TO 1/8"
3/32" ROUND CANE IN PAPER TUBE
2 LAYERS 1/16" SHEET
C.G. ABOUT HERE
SHEET WITH 1/32"
1/16" x 1/4"
2 LAYERS 1/32" OBECHI, TOP LAYER JOINED AS ABOVE, UNDER AS BELOW
Gott 398 2/3 full size.
KEEL 1/8" PLYWOOD
16 S.W.G. (NOTE ANGLE)
PACK UP 1/4" HERE
3/32" SQ
LOWER STRINGERS
BOTTOM STRINGER
SLOT
LEAD WEIGHT
NOTE: BEVEL OFF THESE JOINTS BIND & CEMENT WELL
SCALE. 1/3RD SIZE.
POSITION OF SAFETY PLUG
2 CENTRE RIBS 1/16" SHEET PUT IN AFTER SEPARATING WINGS
SPAR TAPE IS TO 3/32"
3/32" SQ
1/16" x 5/16"
1/8" x 1/4"
ACTUAL LENGTH 16 3/8"
3/32" x 1/32" TOP & BOTTOM
BOX SIDES WITH 1/16" SHEET
FILLETS 1/16"
BIND
WEB 1/16" THICK
RIBS 1/32" OBECHI OR PINE
LAMINATED OUTLINE 4 STRIPS OF 1/8" x 1/32" USE SAME SHAPE OF CARD FORMER FOR FIN OUTLINE.
JOINING PIECE
LEADING EDGE 1/8" SQ.
DIHEDRAL 3 3/4" UNDER TIP
WEB 1/32" SHEET
NO WEB FROM HERE OUTWARDS
SPARS 1/8" SQ TOP AND BOTTOM
TE 1/4" x 1/8"

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,

May I offer a few criticisms on Mr. D. W. Cooper's method of determining the best A.R. for a model wing. In his letter, he states that

$$C_D = \frac{N}{R_e^{\,n}}$$

How I wish this were so! The first thing that strikes a newcomer to low speed aerodynamics is the inconsistent behaviour of aerofoil sections when operating at varying values of R.N. Some even improve their performance in these regions. Thus C_D is not proportional in any way to R.N., and the failure of this basic assumption destroys the structure Mr. Cooper has built thereon.

I should also like to point out that Blasius' form of equation—based, as Mr. Cooper admits on the skin friction of a flat plate—does not apply to an aerofoil section, where the calculation of form drag is much more complex.

In conclusion, I should like to record my opinion that the only practical method of determining the best A.R. for a model wing is to use the experimental performance curves of the aerofoil section used, in the manner already described by J. H. Maxwell.

Tewkesbury. J. HALIFAX.

DEAR SIR,

In the light of your magazine's policy of improving the breed of model aircraft, as exemplified from time to time in your Editorial, I was amazed to see the article on a retracting landing skid for petrol model aircraft in the August issue. Surely there are enough abortions in the petrol world without this open enticement. Although I fully realise that it is your job to represent every shade of opinion in the aeronautical world, I think that the advocation of such a retrogressive step is distinctly harmful to the movement.

The author himself says in the article " . . . that successful retracting and detracting undercarts can be designed and made to work on petrol models is highly probable. *But it would not be easy.*" The italics are mine, for by saying this he condemns himself at the outset.

I would therefore make a request, as just one of your many readers, for less articles of this kind, and more of a type inducive to research and advancement.

Halifax. P. FLETCHER.

DEAR SIR,

In the January issue you published a short article by W. Jones on Competition Flying, in which he says members of the local club go to the field all hours of the day and may be night, to get three flights in for a competition. Mr. C. A. Rippon paid a visit to our Club, and surprised us by asking the time of day at which the club normally starts flying, and whether we waited till the sun set and the wind dropped. He seemed pleased when told that our club hours are fixed and all competitions start at 3 p.m. whatever the weather.

I think it would be very well worth while, in the case of decentralised competitions, to demand the time at which a record flight was made. If it is O.K. to run to the field at 8 a.m. for the first flight, dragging two poor timekeepers out of bed just for the sake of an O.O.S., well, they will keep on winning—by means of an unfair advantage. I do not know what they will do when the centralised comps. are universal once again and all competition flying times are fixed; I suppose they will stay on their own field and dream of past glory won at odd times of the day or night!

We of the Basingstoke Club would like to know what the other readers think about it. I agree that it is necessary to trim after the sun has gone down, but I would rather have a crack-up than fly in good weather conditions which others may not be lucky enough to find.

Basingstoke, Hants. E. J. ALEXANDER.

DEAR SIR,

I was highly amused to read Dr. Forster's attack, lunge, or what-you-will, at the theorists, in "Petrol Topics" (September issue). True he has in part saved his face by professing complete ignorance of elementary mathematics, but surely even this does not entitle him to say that ". . . the theorists will tell you that the only effect of increasing wing loading is to increase the gliding speed (i.e., the forward speed)." I shudder to think what would happen to the theorist who did! The *gliding angle* remains approximately constant, but the *sinking speed*, which increases in proportion to it, is dependant on the forward velocity. In other words, if θ is the gliding angle, and V is the gliding speed, the sinking speed Vs is given by the equation :—

$$V_s = V \sin \theta.$$

For the benefit of other "practical" modellers this is derived from the trig. ratios of right angled triangles!

I am glad that Dr. Forster is so convinced that high drag has an adverse affect on Vs, as this was known to the theorists nearly half a century ago. Obviously the gliding angle is directly dependant on the L/D ratio of the machine.

$$\tan \theta = \frac{D_T}{L}$$

Now as we have already seen, Vs depends on sin θ as well as V. Thus, if D_T is increased, θ is also enlarged, this in turn causing a greater Vs.

"AN INCURABLE THEORIST."

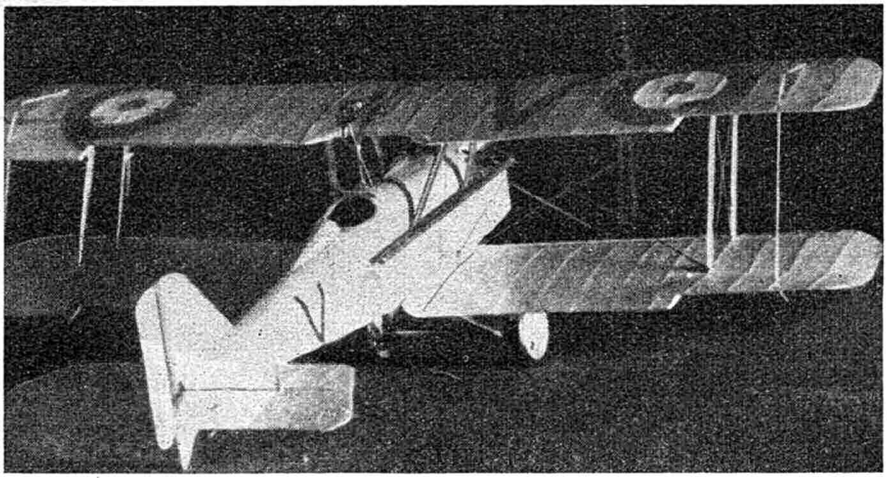
DEAR SIR,

I would like to make a suggestion regarding the Transmitting Licence necessary for anybody embarking in radio control. In the past when we could get a licence it was necessary to do a morse test and a technical test. Now why should a modeller have to do the morse test, when he is never going to use the code? Could not the clubs get together and request the G.P.O. Engineers to issue a special licence to persons using radio for the control of models, conforming to a set of rules, such as :—

1. Frequency to be limited to the 56, 28 and 112 megacycle bands. This makes for light and compact equipment.
2. Power output not to exceed 2·5 watts; this should give ample power over a radius of half a mile.
3. Antenna to be beamed as accurately as possible to avoid interference with other models, and other users of the ether.
4. The usual radio log to be kept, but modified to give details of model(s), type of control.

Ceylon. W. R. MIDGLEY.

We fully agree with the above in general principle although not in detail and suggest that here is a subject for the organising bodies of the Movement to tackle NOW. The G.P.O. should be approached forthwith, as to our knowledge there are innumerable radio control enthusiasts awaiting the word GO. Many others have units under construction and certainly there is no need for this progressive branch of our hobby to be curtailed any longer than necessary. [ED.]



MODEL NEWS

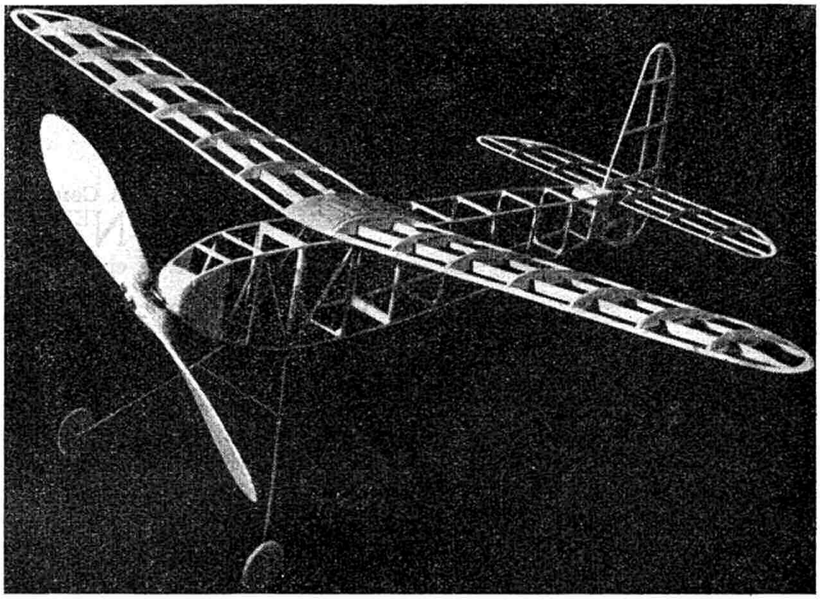
SUPERIOR SCOUT. This built-up model of an S.E.5.A (left) is the work of Mr. M. Crisp of Sidcup, who specialises in last war aircraft. Of scale type construction, it has all the control surfaces operated in the proper manner, beaten aluminium cowling, fully detailed cockpit interior, and all the hosts of other refinements found in the work of a master craftsman.

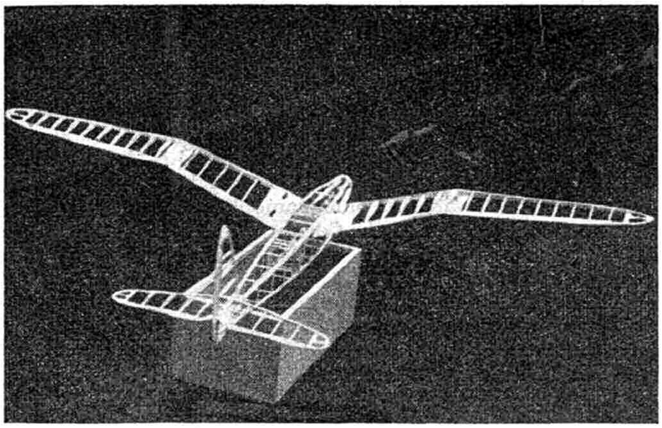
STABILITY III. Designed and built by 15-year-old J. K. Jenkins of Bromley, this beginner's duration model (right) is reported to have a very good performance.

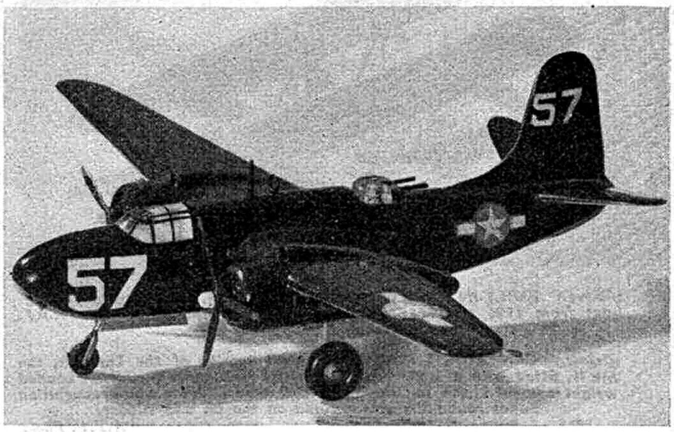
D---D NUISANCES! In the view of Mr. W. G. Smith of Mitcham the above remark applies to packing boxes and methods of launching sailplanes. To alleviate the first, he has designed a sailplane (below) which, despite its 5 ft. wing span, will pack into the box on which it is standing. The launching problem is met by substituting for the nose block a single-bladed folding airscrew and motor of the same overall weight. The machine then becomes, in effect, a powered glider.

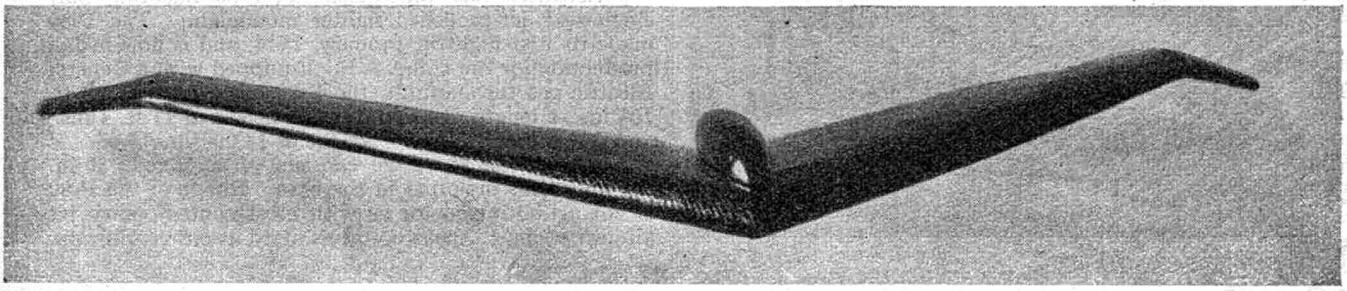
AGGRESSIVE AMERICAN. This 1/72nd scale model of a Douglas Havoc (lower right) is the work of Mr. G. Lucas of Birmingham.

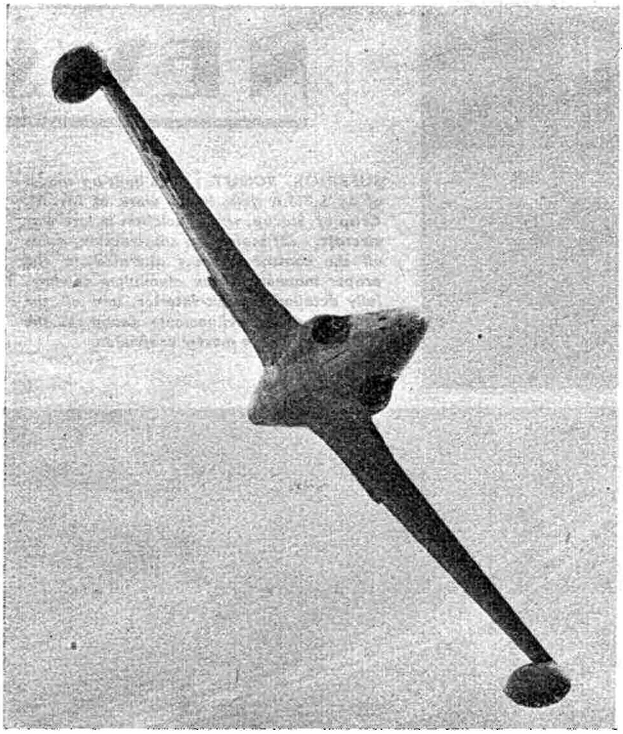
A MODERN FORMULA. Contemporary aerodynamic design is showing signs of breaking out of its rut, and many designers are approaching the problems of flight from entirely new angles. This tailless glider (bottom) is the work of Mr. F. Crowfoot of Bristol, and is a fine example of one of the layouts being developed by modern experimental modellers. The down-swept wing tips are of a special interest, being a very recent innovation in the model world.







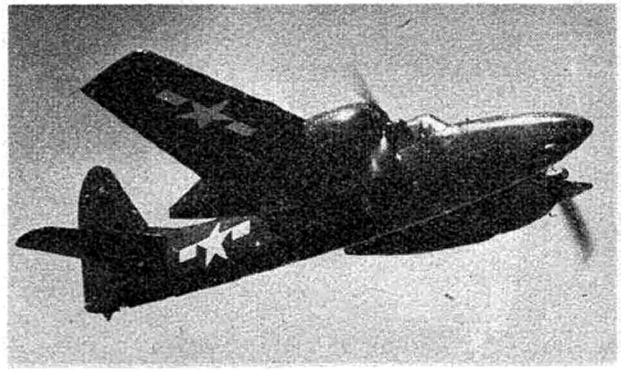




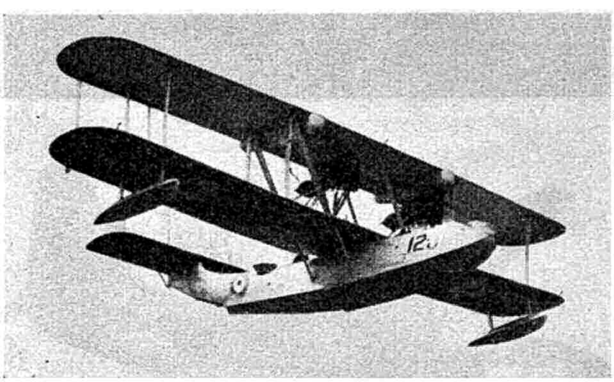
Lockheed Photo.

(Above.) STAR PERFORMER: This view illustrates well the beautifully clean lines of Lockheed's P-80 Shooting Star jet-propelled fighter, just too late to get into action in large numbers against the Japanese.

(Top Right.) A SHIPBOARD TWIN: First deck-landing twin-motor fighter in the world, the Grumman F7F Tigercat showing its paces in a high-speed climb.



Grumman Photo.



Fox Photo.

(Above.) BUILT-IN HEADWIND: Standard R.A.F. reconnaissance flying-boat from 1925 to 1934 the Supermarine Southampton. See R.A.F. Flashbacks on the opposite page.

(Below.) CENTAURUS-TEMPEST: Latest version of the Tempest, the Mk II, fitted with a 2,500 h.p. plus Bristol Centaurus V radial. Loaded weight is about 11,000 lb., the speed still secret. Note white recognition bands round the cowling and on the fin and rudder.

A.T.P. Photo.

MONTHLY

BY O · G · THETFORD

A Centaurus-Tempest.

NEWS has been released of the Hawker Tempest II single-seat fighter, fitted with a Bristol Centaurus eighteen-cylinder, air-cooled radial motor of more than 2,500 h.p. Apart from the motor change, the Tempest II is similar to the current Mark V. The armament consists of four 20 mm. cannon mounted in the wings.

An early Tempest II was serially numbered LA 602. On the left is illustrated a current production version of the batch MW 378, MW 379, MW 380, etc.

Halifax Transport.

Produced shortly before VE-day, the Halifax VIII is a transport and freighter version of the famous heavy bomber. The Halifax VIII is in large-scale service with R.A.F. Transport Command, most aircraft of this type being left the natural metal finish on all surfaces. All turrets have been removed and a freight pannier fitted beneath the fuselage. Four Bristol Hercules 100 motors are fitted. A batch of Halifax VIII aircraft is numbered PP 285, PP 286, PP 287, etc.

Midnight Blue in the Royal Navy.

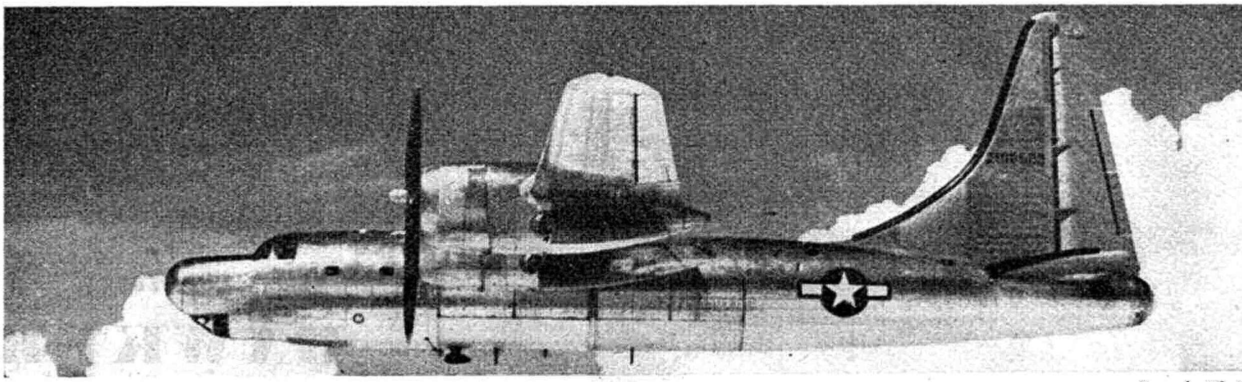
Many aircraft of the Royal Navy have been flying in recent months with Midnight Blue camouflage on all surfaces. This dark glossy blue camouflage is the same as that used on many fighters of the United States Navy. Aircraft with midnight blue camouflage include the Hellcat, the Wildcat and the Corsair. On these machines the serial number and the words "Royal Navy" are painted in white.

At least one Douglas Dauntless dive-bomber is also in service with the Royal Navy, painted in midnight blue on the upper surfaces and pale grey underneath. This aircraft is serially numbered JT 925.

P-38 Successor.

Lockheed has announced the P-80 Shooting Star single-seat, jet-propelled fighter monoplane. The P-80 made its first flight in January, 1944, and is now in full production for the U.S.A.A.F. Equipped with a General Electric gas turbine unit, the P-80 has a span of 38 ft. 10½ ins., a length of 34 ft. 6 ins., a height of 11 ft. 4 ins., and a maximum take-off weight of 14,000 lb.

Armament of the P-80 consists of six fixed ·50-in. machine guns mounted in the nose. Range of the P-80 is not a limiting factor as with most contemporary jet aircraft owing to the drop-tanks fitted at either wing tip.



Convair Photo.
IN LIMITED PRODUCTION: Consolidated's B-32 Dominator would have seen service in the Pacific if the Japanese War had continued. Four Wright Cyclone R-3350 18-cylinder radials. Span: 135 ft. Length: 83 ft. Loaded weight: 100,000 lb. Max. speed: Over 300 m.p.h.

MEMORANDA

A Grumman "Twin."

In action with U.S. Marines in the Pacific some weeks before VJ-day, the Grumman F7F Tigercat is the first twin-motor carrier-borne fighter to be produced. Developed partially from the XF5F-1 Skyrocket of 1940, the Tigercat is produced in two versions, as the F7F-1D single-seat day fighter and as the F7F-2N two-seat night fighter. Outwardly the two variants are indistinguishable.

Powered with two 2,100 h.p. Pratt and Whitney Double-Wasp radials, the Tigercat has a span of 51 ft. 6 ins., a length of 45 ft. 5 ins., and a maximum speed of 425 m.p.h.

The Tigercat has a tricycle undercarriage and can carry eight rocket-projectiles beneath the wings, a 22-in. marine torpedo or 4,000 lb. of bombs. Normal camouflage is midnight blue on all surfaces.

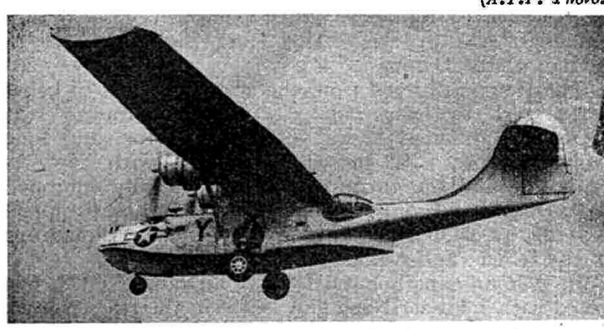
R.A.F. Flashbacks—11.

The Supermarine Southampton was the standard reconnaissance flying-boat of the R.A.F. from 1925 to 1934, when it was replaced by the Supermarine Scapa.

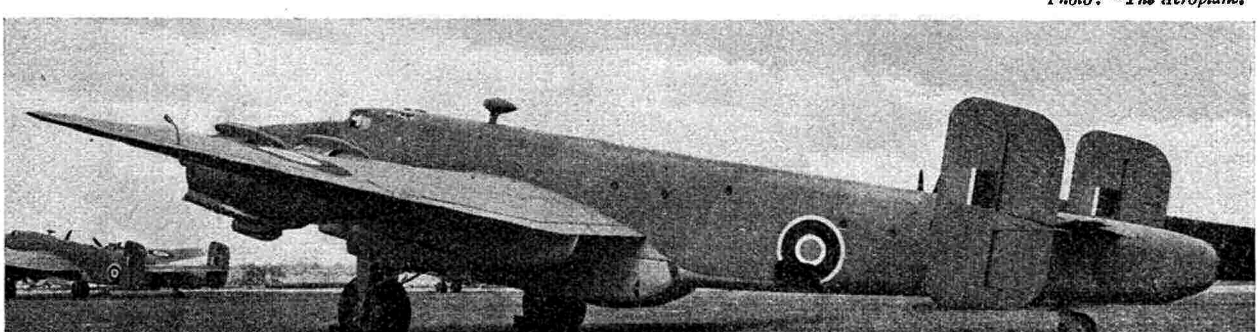
Fitted with two 470 h.p. Napier Lion motors, the Southampton had a span of 75 ft., a length of 49 ft. 8 ins., and a loaded weight of 14,600 lb. The top speed was 108 m.p.h., and the climb to 5,000 ft. occupied 10 minutes.

Southamptons were doped silver all over (some had white hulls) and batches were numbered S 1151, S 1152, S 1153, etc., and S 1645, S 1646, etc. The serial number (without the index letter) was reproduced on the bows as well as being on the rear hull, the rudders and beneath the lower wings. Roundels overlapped the ailerons, and red, white and blue vertical stripes, blue foremost, were carried on all three rudders.

Vickers Photo.
(Above.) **TEAR-DROP EIGHT:** The prototype Spitfire VIII, JF 299, fitted with a tear-drop cockpit canopy.
(Below.) **WHITE CAT:** White-camouflaged PBY-5A amphibian of the British-based VPB 63, U.S. Navy.
(A.T.P. Photo.)



FOR TRANSPORT COMMAND: Two of the new transport versions of the Halifax, Mk. VIII, photographed at Radlett. Note the latest red, white and blue roundels above the wing. Many Halifax VIII aircraft are flying without camouflage.
Photo: "The Aeroplane."



AEROPLANES DESCRIBED XXXII

The HAWKER DEMON

THE single-motor two-seat fighter class has its origins in the Great War, 1914-18, and its most famous representative in those years was the Bristol Fighter, though the pioneer work was done by the Sopwith 1½ Strutter. The Strutter was the first two-seater in the R.F.C. to mount the observer's cockpit behind the pilot, providing an effective tail defence. The earlier B.E. two-seaters mounted the observer amid the centre-section struts and wires ahead of the pilot where his Lewis gun was almost useless. The advantage of the two-seater in combat was that after a normal attack with the fixed front guns it was also possible to engage the E.A. with the rear guns during the zoom away.

The two-seat fighter was allowed to lapse after the Great War until 1931. In that year the high performance of the Hawker Hart as a day bomber gave rise to the idea of a fighter version. As an experiment, one flight of No. 23 (F) Squadron, then equipped with Bristol Bulldogs, was provided with Hart Fighters, later to be named the Demon.

The Demon differed from the standard Hart in being fitted with two-way radio, a modified cutaway rear cockpit, a different series of Kestrel motor, and long exhaust pipes. It proved successful with No. 23 Squadron and the entire unit was eventually equipped with Demons. From 1934 onwards the Demon equipped Nos. 29, 41, 64, 65, 600, 601 and 604 (Fighter) Squadrons of the R.A.F. and Auxiliary Air Force.

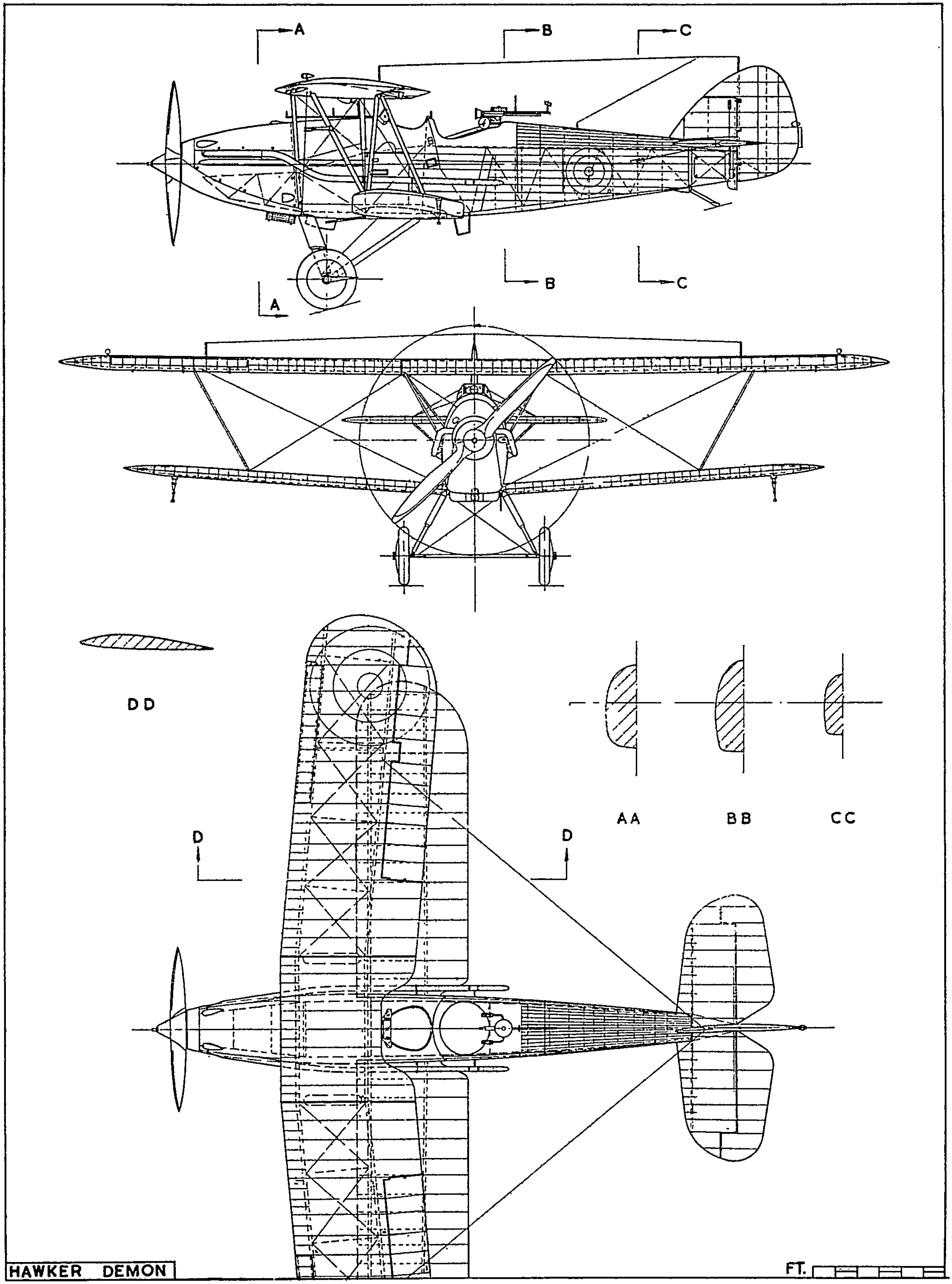
In 1935 an experimental Demon, airframe J 9933, was fitted with a Frazer-Nash gun turret in the rear cockpit. The Turret-Demon was put into production at the Boulton and Paul factory in 1936, and by 1937 was in service with No. 64 (F) Squadron. Although rather slower than the earlier version, the Turret-Demon was an interesting forerunner of the Defiant monoplane.

Dive-bombing Demons using light practice bombs were a familiar sight at many R.A.F. displays. No. 604 Squadron's Demons engaged in a memorable mock battle with No. 101's Overstrands at the 1937 Hendon display, and the Turret-Demon was on public view with No. 64 Squadron on Empire Air Day of that year.

By 1938 the Demon was declared obsolete and many of the former Demon squadrons converted to Blenheim Fighters during 1939.

The Demon was the last of the biplane two-seat fighters with the R.A.F. The Defiant monoplane was the only representative of the old formula employed by the R.A.F. in the Second World War and it seems unlikely that the class will ever be revived.

Specification: One Rolls-Royce Kestrel V (de-rated) 12 cylinder liquid-cooled Vee motor, developing 560 h.p. at 17,800 ft. Span: 37 ft. 3 ins. (top wings); 31 ft. 4 ins. (bottom wings). Length: 29 ft. 7 ins. Height: 10 ft. 10 ins. Wing area: 348 sq. ft. Empty weight: 3,139 lb. Loaded weight: 4,669 lb. Wing loading: 13·4 lb./sq. ft. Maximum speeds: 155 m.p.h. at 3,280 ft.; 162 m.p.h. at 6,560 ft.; 169 m.p.h. at 9,840 ft.; 181½ m.p.h. at 16,400 ft.; 177½ m.p.h. at 19,680 ft. Climb: 2·1 mins. to 3,280 ft.; 10½ mins. to 13,120 ft.; 16·9 mins. to 19,680 ft. Endurance: 2½ hours. Ceiling: 27,500 ft. Armament: Twin fixed synchronised Vickers ·303 machine-guns forward and one Lewis machine-gun aft. Light bombs beneath the lower wings.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HAWKER DEMON
FT.

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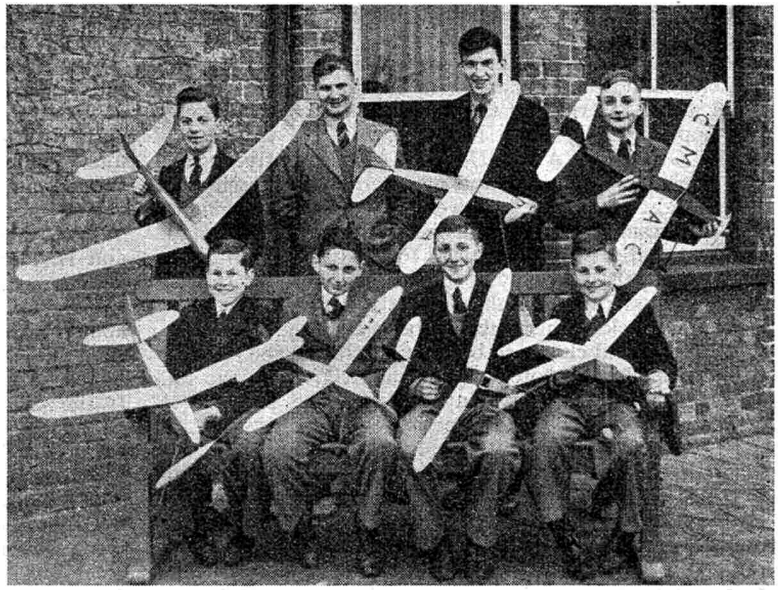
Model Aerodrome

141. STRATFORD RD. BIRMINGHAM, 11.

CLUB NEWS

BY CLUBMAN



Members of Caldecote M.A.C. "on parade."

WELL, well, it's all over at long last ! ! ! No, I'm not talking about the good old "streamline-slabsider" controversy, but the WAR. With all of you, I dare say, it takes some realising that, after all these hard fought years, we can once again start to plan for normal activities, though one naturally does not overlook the fact that many matters must take priority over our modelling enthusiasm. However, whatever the job, one must have a certain amount of relaxation, and we know that aeromodelling is the best method of attaining that end, so here goes for the good old times of big meetings, national and international events, and those enjoyable get-togethers that I for one have missed so much during the past six years.

All that remains is for the R.A.F. to decide how soon they can manage to carry on without the assistance (?) of yours truly, though with the present slow rate of demobbing, plus my release group number (which sounds more like the population figure for China) . . . ah, well !

Quite a number of letters have arrived from over the water this past month, most of the writers being in quest of pen pals—quite a worth-while occupation, as I have found from personal experience. Those who care to exchange views and news with other countries might like to get in touch with either of the following enthusiasts —G. A. van Rees, 22, Middenweg, Vught, Holland; E. Henderson, 52, Boronia Avenue, Epping, N.S.W., Australia, Robert Hoper-Hall, 18, Hawkesbury Avenue, Kilburn, South Australia.

J. R. Lawrence, of 2905 W. Germak Road, Chicago 23, Ill., U.S.A., writes "Our club here, the 'Aero Grasshoppers,' would like to make contact with a few of your clubs. We would like to also be of whatever service possible to the clubs of your country." Now then, you club secs., what about it ?

1578828 L.A.C. Brian G. Hewitt, 134 R.S.U., R.A.F., S.E.A.A.F., a former member of the King Edward's M.A.C., wishes to contact two former friends of his, A. Newth and L. Wand, and I trust these chaps read these notes.

Sunday, July 1st, began in a manner most unpromising from any point of view, especially an aeromodeller's. It RAINED ! ! ! In fact, it poured, and the first of the 1945 NORTHERN RALLY's looked like being a good old wash out. The barn at Springfield Park was crammed to capacity with over 150 aeromodellers and their "coffins." The one bright spot was the excellent catering arranged by the Rochdale (A.T.C.) M.A.C.

Early afternoon saw a lessening in the downpour, and some stalwarts went out to the flying ground to start the Rally. After being driven back two or three times by sudden downpours, the various competitions started in earnest. Owing to the loss in time the flights for the contests were cut to one flight each, and it was found possible to finish just in time for the stipulated time for prizegiving. Full results were :—

Open Duration :		
Hardman	(Rhyl)	185·4 secs.
Lancaster, N. P.	(Bolton)	141·4 ,,
Hetherington, M.	(Doncaster)	110·5 ,,
O'Donnell, E.	(Merseyside & U.S.A.)	72·8 ,,
Sailplane :		
Uttley, P.	(Blackpool)	330·0 secs. o.o.s.
Heginbotham, W.	(Ashton)	92·0 secs.
Heron, A. S.	(Whitefield)	90·0 ,,
Harrison, D. F.	(Birmingham)	85·0 ,,
Consistency :		
Hellewell, T.	(Doncaster)	
Robinson, K.	(Ashton)	
Owen, J.	(Blackpool)	
All-in Contest :		
Robinson, K.	(Ashton)	70·0 secs.
Heron, A. S.	(Whitefield)	68·0 ,,
Cameron, I. S.	(Merseyside)	60·0 ,,
Hetherington, M.	(Doncaster)	60·0 ,,
Concours d'Elegance :		
Flying Scale :		
Barnes, G.	(Sale)	
Parrish, H.	(Ashton)	
Duration :		
Gosling, R. F. L.	(Merseyside)	
Bentley, R. V.	(Blackpool)	
Junior Section :		
Open Duration :		
Breelan, H.	(Wilmslow)	52·0 secs.
Wraith, P.	(Wilmslow)	43·2 ,,
Sailplanes :		
Eckersley, S.	(Bradford)	71·0 secs.
Jones, D.	(Wallasey)	26·0 ,,

K. Robinson of the Ashton and District M.A.C. was Champion of the Rally by virtue of his win in the "All-in" event, and a second place in the "Consistency" contest, and carried off the cup donated by the Manchester *Daily Despatch*. Numerous other trophies and prizes were donated by many of the dealers, and altogether the meeting was an enjoyable affair, in spite of the efforts of the Clerk of the Weather. I would like to get to the second Rally due to take place on the 9th September, but one cannot make plans with any degree of certainty when under the rules of the Service. However, one can still hope.

The GREAT YARMOUTH M.A.C. recently moved into their new premises, and members have presented a pretty sight all decked in flowered overalls and dustcaps, with the result that flying has been somewhat restricted. However, the secretary was fortunate in obtaining nearly 200 yards of really good aero strip rubber (source not disclosed) and members have taken advantage of their good luck. This club has been awarded a Government grant, and claims to be the first club in the country to be officially sponsored. (You might give me the full "gen" about this, Yarmouth, then I can pass on to others who might be interested.)

BLACKPOOL & FYLDE M.A.C. are for once not blaming the weather for the rather poor times put up in the M.E. No. 1 Cup. The failures were caused mainly by the unsuitability of the ground for towing and winching of model sailplanes, the lines getting hopelessly tangled in the long grass. P. Uttley made the best time of the day with 1 : 36, his aggregate being 109·3 secs. J. Owen came second with 156·4, with F. Mitchell third with 133·4 secs. The rather strong wind spoilt what would otherwise have been an extremely interesting contest for the K. and M.A.A. Biplane Cup, Owen placing first this time with three flights of 58·5, 49·2 and 44·1 secs. Mrs. Bentley has the distinction of being the first local lady member to fly in a competition—the Women's Challenge Cup. (Incidentally, no competition results have been received from the S.M.A.E. this month, so have no idea how Mrs. B.'s times placed her.)

The BRISTOL & WEST M.A.C. have been unlucky with weather this year, but have been putting up some decent times in spite of this. E. Middleton won the club Open Glider Cup, aggregating 218 secs. for two flights with his 30 oz. 7 ft. span lifting fuselage glider. A. H. Lee made a fine aggregate of 284 secs. in the Biplane Cup, our old friend F/Lt. Needham placing second.

"Wings," the home produced magazine of the HALSTEAD (Essex) M.F.C., has made a welcome reappearance, and I am pleased to hear that this club is getting going once again.

BLACKHEATH M.F.C. won the team event at an inter-club affair on Chingford Plain on the 29th July. I. Lewis won the rubber duration event with two flights, his second flip being 8 : 21 o.o.s., while R. H. Warring placed second, his best time being 4 : 47·9, also o.o.s. The club is hoping to hold a Social and Dance sometime in the winter—the first since 1938.

Mr. Hewitt of the OXFORD CIVIL DEFENCE M.A.C. lost his own design after a flight of 3 : 20 o.o.s., and an "Ivory Gull" followed suit shortly after with a time of 8 minutes. Both were white tissue covered, and have not been returned.

If the indications from the CHINGFORD M.F.C. are observed generally throughout the country, aeromodelling—and clubs—are in for a bumper time, for not only is membership increasing, but a number of seniors and "old hands" are reappearing. These latter will strengthen clubs far greater than mere numbers, for no matter how well a club of lads is run, it can never become so "solid" as one guided by the experience of the old brigade.

The WALTHAM & ENFIELD M.A.C. now numbers about thirty members, and times are improving rapidly. Westaway has flown his modified "Trooper Glider" for flights of 15 and 10 minutes, while Warren has had flights of 2 : 13 and 3 mins. from his 5 ft. span "Excelsior IIB." R. A. Parker's Flight Cup model has clocked 2 minutes consistently, with a best time of 4 : 20. A glider comp. scheduled for August 12th was blessed with fine weather, but could not be held owing to the timekeepers failing to turn up ! ! ! Bad show, chaps.

After a long silence, the BURY & D.M.A.C. send news of their activities. Tail-less gliders are very popular, and E. Hargreaves holds the club record for this class with a flight of 2 : 10 o.o.s. (This figure is higher than the British record held by R. F. L. Gosling, so what about putting in a claim ?) Hargreaves entered a 6 ft. span tail-less glider in the area eliminator for the Handley-Page contest, and aggregated 232 secs. hand launched. In the M.E. No. 1 Cup, N. Duxbury raised the club H.L. glider record to 4 : 25 o.o.s.

The COVENTRY M.A.C. hired a coach to travel to the Midland Rally, held at Sutton Park on July 15th, and a really good time was had by all. R. Draper won the Glider event with his "King Falcon," his aggregate being 347·4 secs. An aggregate of 231·1 secs. won second place for B. Whitehouse who was flying an "Igo." J. Barrett's fourth place in the lightweight glider comp. made a nice little bag for the day ! The East Birmingham club paid a visit to Coventry for an inter-club tussle which resulted as follows :—

Open Duration :		
Phillips, V. H.	(E. Birmingham)	164·8 agg.
Barrett, J.	(Coventry)	111·2 ,,
Hollis, R.	(Coventry)	104·0 ,,
Open Glider :		
Barrett, J.	(Coventry)	291·2 agg.
Thomas, K.	(E. Birmingham)	242·2 ,,
Hollis, R.	(Coventry)	211·0 ,,

The MERSEYSIDE M.A.S. recently held a further exhibition, a large marquee nearly bursting with spectators when r.t.p. flying and petrol motor demonstrations were in progress. Messrs. Airey, Coupe and Dutton were winners of the special Concours d'Elegance.

The first competition to be held by the newly formed MOTTINGHAM M.F.C. was held on July 29th. Rubber being almost unobtainable, the event was confined to gliders, results being: A. Meddemen 1 : 14, J. Owen 1 : 13·5, G. Jenkins 1 : 03.

In spite of poor weather the WALLASEY M.A.C. has entered every national to date, thus showing there

THE BOWDEN INTERNATIONAL TROPHY

Held at the Handley-Page Aerodrome, Radlett, On September 2nd, 1945.

G. Clark (Bushy Park)	**198 pts.**
W. Dallaway (Birmingham)	**175 pts.**
S. Lanfranchi (Bradford)	**170 pts.**

HANDLEY-PAGE TAILLESS COMPETITION.

Held at Radlett Aerodrome, On September 2nd, 1945.

R. E. Connor (Brentford)	**127·3 pts.**
A. H. Taylor (Bushy Park)	**120·0 pts.**
D. A. Pavely	**115·0 pts.**

Owing to the close proximity of the above contests to our press date, full reports together with photographs must necessarily appear in the November issue.

is no lack of enthusiasm! D. Hill clocked 9 : 20 o.o.s. with his glider "Albatross," the model landing in the sea, while A. Molyneux has had a 7-minute flight H.L. with his new high A/R glider. The longest club flight to date was made by the "Firefly" designed and built by B. J. S. Foster. This model flew from Wallasey, across the River Mersey, over Liverpool, then on to a point midway between St. Helens and Wigan, a distance of 15¼ miles.

F. Pearson of the SWADLINCOTE M.A.C., flying a "Beauglider III," has raised the club record to 1 : 43 from a 200 ft. towline, while B. Springall has put up a speed of 25 m.p.h. with his r.t.p. model which has a span of only 8 ins., with fuselage and tail made from 1/64th sheet. R. Wagstaff brought an old-fashioned flavour to the club by constructing a floating "A" frame machine.

The WOLVERHAMPTON & D.M.A.S. were another club to visit the Midland Rally, and were pleased to collect first and third places in the lightweight glider class through P. Fisher (5 : 42·2) and S. Ward (4 : 30).

WHITEFIELD M.A.C. have had a mixed bag so far this year, best time to date being Gordon Whittle's 7 : 42 in the Pilcher Cup, second best being Whalley's 4 : 10 in the National Cup. Incidentally, who is the poor sport who would not make a third for the club entry for the Flight Cup. Not very good co-operation for a club member, is it!

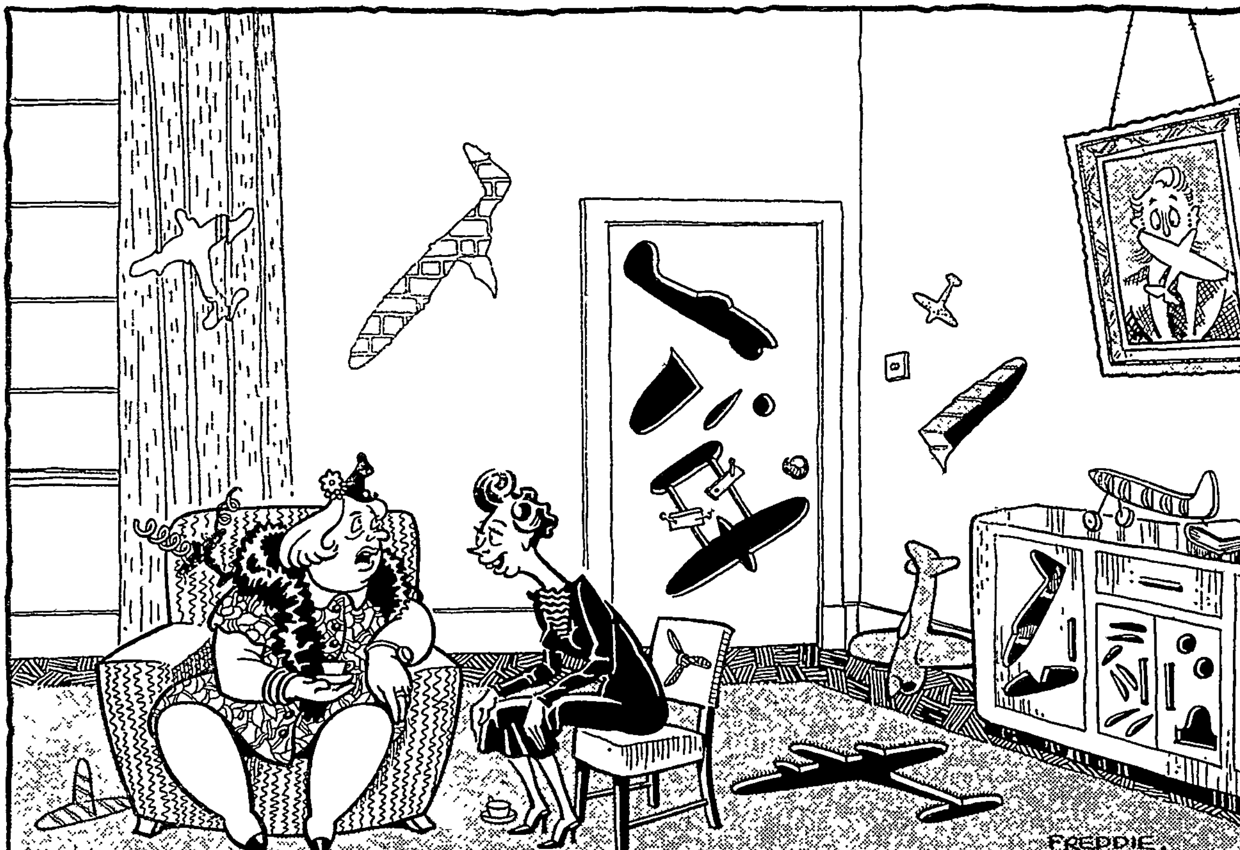
M. Hetherington's "Isis" glider, the star turn of the DONCASTER & D.M.F.C., has now gone for good. This model, which put up some remarkable times both last year and this, was despatched from a 50 ft. line and climbed rapidly up to a storm front, disappearing from sight. Construction is going forward with tail-less gliders, and two six-footers are nearly finished. Rocket propulsion has also been tried, record held at present by junior member B. Hetherington with a time of 29 secs.

F/Lt. J. T. Robson of the Officer's Mess, R.A.F. Station, Benson, Oxfordshire, is enquiring about a glider lost on the 23rd August from that station. Last seen at 2.25 p.m., the model was making in the direction of Eaton Bray! Of 36 ins. span, the model has no fin and a dihedral tailplane, with black fuselage and lifting surfaces in yellow.

The weather was kind for the first field day of the newly formed EXMOUTH & D.M.A.C. First event was an open glider contest, which was won by J. Saturley with a time of 1 : 44·5, also making best time of the day with a flight of 55·5. Seven competitors entered for the Harris Cup for duration models, winner J. Muller (1 : 12), second J. Thorn (50·5). A nomination event was won by L. Moger.

The BURTON-ON-TRENT M.A.C. had its first opportunity of staging an exhibition at a local fete, and put on a very successful show, with over sixty models on show ranging from solids to petrol jobs. Ten-year-old P. Spooner has raised the junior club record to 1 : 21 with his "Aegeus," while D. Clark has been putting up some flights with his "Thermic 50," including a flyaway of approx. 5 minutes from a catapult launch.

J. Vandervelds of the RIPON M.F.C. recently clocked approximately 15 minutes with a modified "Mick



"YOU'LL NEVER GUESS HENRY'S NEW HOBBY"?

Farthing" glider, main difference being a dihedralled tailplane. This club "has withdrawn from the S.M.A.E. owing to lack of spare time." This seems a rather poor excuse—no club has unlimited spare time, but they don't all go chucking in their hand!

Two chaps wish to get clubs going in their districts, so get in touch those who would like to have a shot at club life. Fellows concerned are F. Pilkington, 14, Ely Road, Littleport, Cambs., and B. E. D. Beckett, 91a, Belle Vue Road, Southbourne, Bournemouth.

And that, apart from the usual list of new clubs and secretarial changes, is the lot for this month. I am hoping to visit the Handley-Page tail-less contest on the 2nd September, and will give you the "gen" on what transpired. I look forward to a most interesting event, and trust this is the forerunner of many similar important events on the official calendar from now on. Cheerio till next month, and keep 'em flying.

THE CLUBMAN.

NEW CLUBS.

EAST LIVERPOOL M.A.C.
A. E. Burchill, 50, Kings Drive, Liverpool, 14.
NORTON (Durham) M.A.C.
T. Hornshaw, 31, Station Road, Norton, Stockton-on-Tees.
RUISLIP & NORTHWOOD M.A.C.
J. K. Pudney, Westminster Bank House, Ruislip, Middlesex.
TYLDESLEY & D.M.A.C.
H. F. Pennington, 177, Henfold Road, Tyldesley, Near Manchester.

SECRETARIAL CHANGES.

CATHCART & D.M.E.S.
R. Brace, 319, Holmlea Road, Glasgow, S.4.
PRESTON & D.M.A.C.
G. Fare, 61, London Road, Preston, Lancs.
HOUNSLOW & D.M.A.S.
P. Tavener, 99, Nelson Road, Whitton, Middlesex.

WANTS AND DISPOSALS

WANTS

(29) AEROMODELLERS, Jan. and Feb., 1944.—M. White, 80, Kilmendon Road, Haydon, Radstock, Nr. Bath, Somerset. (30) Bound volumes of the AEROMODELLER, years previous to 1943. Will pay up to 15s. if as new.—D. Stollery 1, Crow Wood Park, Rochdale Road, Halifax. (31) AEROMODELLERS, Jan., April, May, 1945.—D. O'Neel, 34, Hanishen Street, Heath, Cardiff. (32) "Aeroplane Spotter," Nos. 1 to 134, "A.T.C. Gazette," Vols. I, II, III.—R. Radford, 24, Holme Avenue, Dalton, Huddersfield, Yorks. (33) AEROMODELLERS, 1939–41, April issue, 1942. Preferably in good condition.—G. D. Hellewell, "Windyridge," Melton Road, Sprotborough, Nr. Doncaster. (34) AEROMODELLERS, Dec., 1938–Dec., 1942, in good condition.—A. Brooking, 10, Radcliffe Avenue, Enfield. (35) "A.F.P.," Vol. II. £1 for copy in good clean condition.—F. Hughes, 19, The Avenue, Bedford Park, London, W.4. (36) "A.T.C. Gazette," Nos. 1, 2, 3, 5 of Vol. I, Nos. 3, 6, 9 of Vol. II.—K. V. Russell, 44, Jubilee Terrace, Lower Delph, Brierley Hill, S. Staffs. (37) Feb., 1944, AEROMODELLER, and 9 in. paulownia prop.—V. G. White, 25, Watson Road, Worksop, Notts. (38) Back issues of the AEROMODELLER, "Model Aeroplane Constructor,". "Model Airplane News," "Air Trails," "Frank Zaic's Year Books," 1937 and 1938.—14867515 Pte. L. P. Spink, 12 Platoon, B Company, 2nd Com., South Staffords, c/o A.P.O., England. (39) Small electric motor, approx. size 2 in. by 1½ in. by ⅝ in., suitable for model aeroplane.—A. Mulloy, 73, Goldthorn Hill, Wolverhampton, Staffs.

DISPOSALS

(28) "A.F.P.," Vol. IV, 18s. 9 copies of "Flight" and 6 of the "Aeroplane," 1944–45, 8d.; 5 "A.T.C. Gazettes," 1944–45, 4d.; "Aeronautics," 1944–45, 1s.; and 3 AEROMODELLERS including double Xmas number 1943, 8d. and 1s. each. — J. Gear, 24, Exeter Road, Southgate, N.14. (29) AEROMODELLERS, Vols. I–IX. Dec., 1935–Dec., 1944, eight issues only missing. "Model Aeroplane Constructor," first ten issues 1935–36, excellent condition, £3.—B. Harrison, 62, Edge Lane Drive, Broadgreen, Liverpool, 4. (30) Several completed flying models, write for details.—985176 Cpl. Graham, "A" Flight, 90 Sqdn, Tuddenham, Bury St. Edmunds, Suffolk. (31) AEROMODELLERS, No. 1, Vol. I to date, 11 missing. Also many flying magazines.—G. J. Gulliver, 31, Bridle Lane, Streetly, Nr. Birmingham. (32) AEROMODELLERS, Nov., 1943–May, 1945, "A.F.P.," Vol. I, "Solid Model Aircraft," 16 1/72nd solid scale plans.—I. Spinks, 26, Warren Avenue, North, Fleetwood, Lancashire. (33) "Jane's" for 1940, perfect condition.—D. Moore-Hepplestone, 2, Clough Road, Rotherham, Yorks. (34) "Scale Model Aircraft that Fly," "A.B.C. of Model Aircraft Construction," "Petrol Engines," 2s.; "Solid Model Aircraft," 1s. 6d.; "A.F.P.," Vols. II, III and IV, 17s. 6d. each.—W. Brown, 167, Ringwood Road, Parkstone, Dorset. (35) Pair 4½ in. dia. airwheels; single 2½ in. dia. airwheels, all need slight attention; new coil. 30s. the lot.—H. A. Alcock, 6, Littlegate Street, Oxford. (36) "A.F.P.", Vols. II and III, 15s. each. Perfect condition. AEROMODELLERS, 41 copies from Feb., 1942.—R. Hainsworth, 101, Muswell Hill Road, Muswell Hill, N.10. (37) "A.F.P.," Vol. III. Excellent condition.—P. McKenzie, 3, Meadow Gardens, Bainbridge Avenue, Sunderland, Co. Durham. (38) 1 in.–1 ft. flying scale "Lysander" plan, tissue, 3-blade v.p. prop. and wheels, 10s.—I. Ralph, Clanna Cottage, Alyington, Nr. Lydney, Glos. (39) "A.F.P.," Vol IV, 17s. 6d.; "Art of Making Solid Aircraft," 3s.; "Solid Model Aircraft," 1s. 6d.; "What is that Aeroplane," 3s. 6d. All in good condition.—W. Lawson, 27, Harrison Buildings, E. Sunderland. (40) AEROMODELLERS, Nov., 1943, Jan./Oct., 1944.—M. Arcari, 136, Kingswood Drive, King's Park, Glasgow, S.4. (41) "A.F.P.," Vols III and IV, 35s. Sold separately if required.—G. E. Clark, 144, The Butts, Frome, Somerset. (42) AEROMODELLERS, 1944–May, 1945, 8d. each. "Solid Model Aircraft," 9d.; assorted plans and materials, prices on application.—J. D. Mason, 61, Gates Green Road, West Wickham, Kent. (43) 7 ft. span petrol model complete with 10 c.c. Brown engine, timer, coils, etc., placed National Competition. 3½ in. airwheels, £10. "Eaglet" with 3 c.c. Ohlsson engine complete, less prop. and covering, £8. Both in perfect condition.—F. S. Thomson, 3, Brampton Road, Huntingdon. (44) 54 in. span petrol model with planked fuselage, spun aluminium cowling and silk-covered flying surfaces in perfect flying condition, complete with new Ohlsson 23, coil, condenser, airwheels and flight timer, £15.—Blakey, 177, St. Johns Road, Wembley. (45) 2 pairs 3½ in. airwheels, single 4½ in. dia. airwheels. Valves not guaranteed.—A. E. Currie, 19, Cavendish Place, Jesmond, Newcastle-on-Tyne. (46) 10 c.c. Hallam petrol engine complete with plug, coil, condenser and flywheel, £7.—B. J. Howard, West Gable, Brooklands Road, Sale, Ches. (47) Brand new Hallam Nipper 5·8 c.c. engine with new prop., condenser, plug, less tank and coil, £7.—J. Costa, 11, Stokes Road, Hendra, Truro, Cornwall. (48) "Aeronautics," Nov., 1940–Sept., 1945.—H. V. Hodgkinson, 76, George Street, Newcastle-on-Tyne, Staffs.

EXCHANGE

(20) Nearly finished 6 ft. "Premier Lion" minus engine and wheels for kit of 54 in. American "Ace" or £1.—M. J. Cowburn, 22, Grange Road, St. Annes-on-Sea, Lancs. (21) New Mullard PM22A Battery Pentode Valve, worth 22s., in original packing, excellent condition, for any 12 AEROMODELLERS previous to 1940.—D. Stollery, 1, Crow Wood Park, Rochdale Road, Halifax

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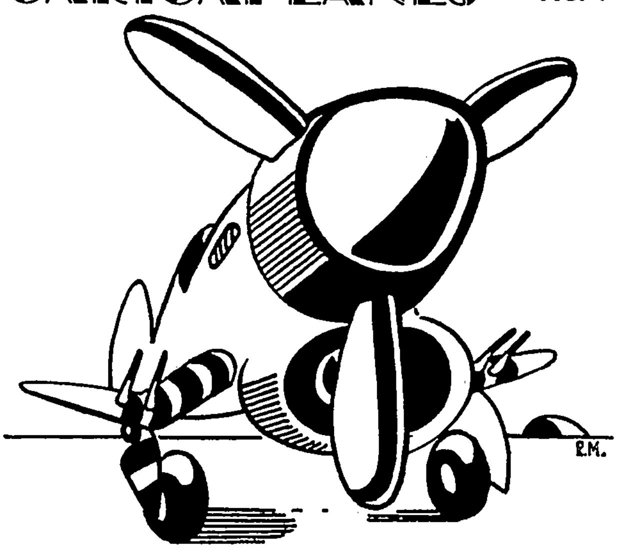

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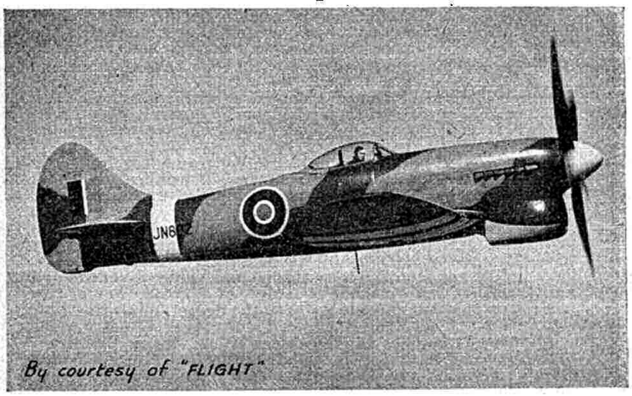

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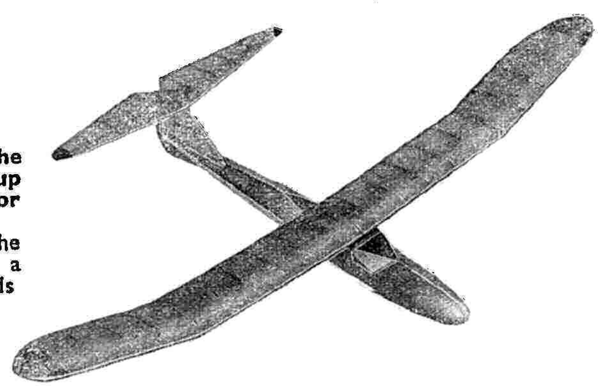

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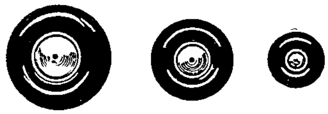

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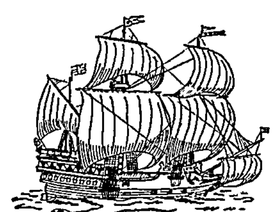

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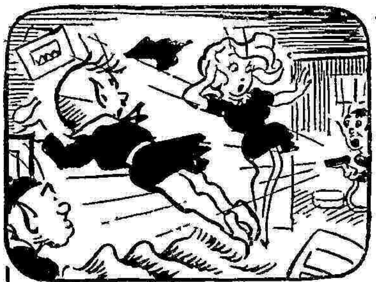

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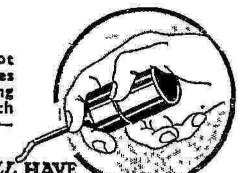

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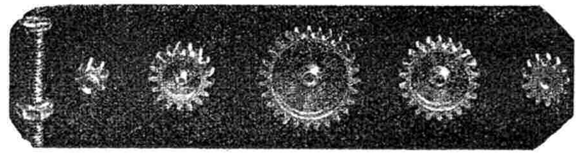

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