AERO MODELLER

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SEPTEMBER · 1940
EIGHTPENCE

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Hlsat Blog Free Plans and Articles.

http://www.rcgroups.com/forums/member.php?u=107085

AeroFred Gallery Free Plans.

http://aerofred.com/index.php

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Diligence Work by Hlsat.

THE AERO-MODELLER

ALLEN HOUSE

NEWARKE STREET, LEICESTER, ENGLAND

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Editor: C. S. Rushbrooke

Draughtsman: C. A. H. Pollitt

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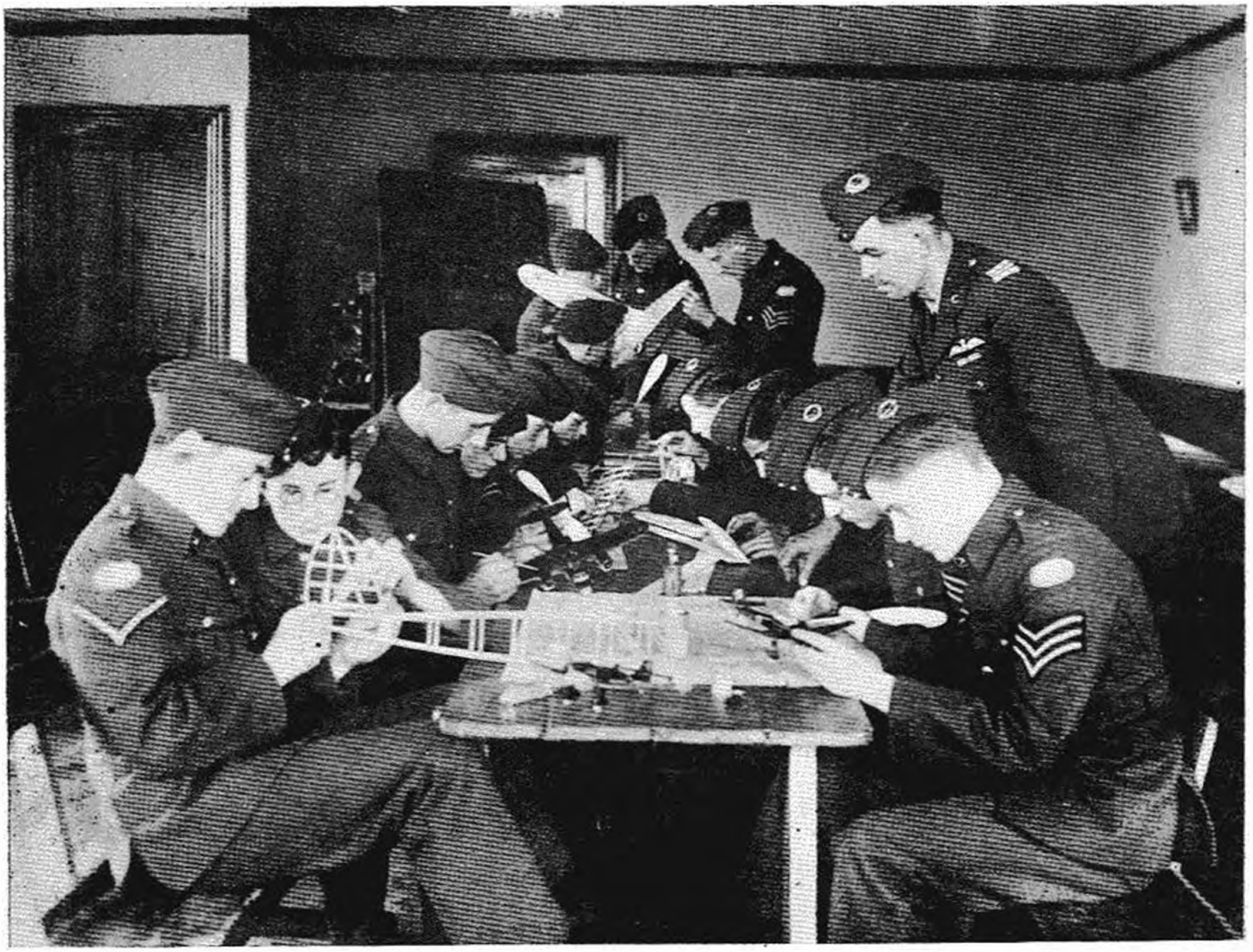
VOL. V, NO. 58 SEPTEMBER, 1940

TRAINING THE YOUTH OF GREAT BRITAIN



The Commanding Officer of Redruth Air Defence Cadet Corps inspects models in the clubroom.

The AERO MODELLER
INCORPORATING "THE MODEL AEROPLANE CONSTRUCTOR"
SEPTEMBER, 1940
Vol. V. - No. 58
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Editorial

NO doubt readers will have noticed that on Monday, August 5th, an announcement was made in the daily Press to the effect that, under an order issued by the Air Ministry, it is now an offence to fly certain types of models. Petrol 'planes of all classes, sizes, and descriptions, and rubber-driven models and gliders with a wing span of 7 ft. or over, are now banned.

If we examine these restrictions, what do we find? That assuredly they are most reasonable and hamper our hobby hardly at all. For several reasons the flying of petrol 'planes has been cut down during this year; in fact, we know of many perol 'plane enthusiasts who have voluntarily given up the flying of their 'planes so as to avoid the possibility of making difficulties for local members of the R.A.F. and Observer Corps. Similarly, those aero-modellers who specialise in large-size gliders, have voluntarily reduced their flying to such an extent that it has become negligible.

We commend the action of these aero-modellers in *voluntarily* restricting their flying, which has resulted in the very important fact that for nearly the whole of the first year of this war no ban has existed at all, obviously because it was not necessary. Now, with the war brought nearer to our shores, it is naturally essential that certain precautions shall be taken in the interests of everyone, and, quite rightly, the Air Ministry has now made the regulations to which we refer, and which we feel are extremely reasonable.

No rubber-driven 'planes with a span exceeding 7 feet have come to *our* knowledge, and the net result, therefore, is that to all intents and purposes the average aero-modeller who flies rubber-driven models or gliders is in no way restricted . . . neither are builders of solid models!!! We feel sure that aero-modellers throughout the country, when flying their models, will take the greatest care to see that no flying is done near the coast or under such conditions as to cause the slightest difficulty to our defence units, and thus we shall continue to keep the hobby alive throughout the war.

The S.M.A.E. Spitfire Fund.

It was a rather interesting coincidence that, a day or two before the S.M.A.E. meeting, held on Sunday, August 4th, we should receive at our offices from different parts of the country the same suggestion: that a fund to buy a "Spitfire" should be subscribed by aero-modellers throughout the country. In our view, such an idea needs no elaborating: it is so obvious. We considered that the fund should be administered under the auspices of the S.M.A.E., and, accordingly, Mr. Rushbrooke brought this matter forward at the Council meeting above referred to.

We are glad to say that the idea received the wholehearted support of all present at the meeting, and, as is announced in the S.M.A.E. report of this meeting, published elsewhere in this issue, the idea was formally approved of.

Mrs. McQueen, of Kanga Aero Models, has kindly offered to attend to the necessary booking of subscriptions, and we, too, are prepared to accept contributions to the fund. All contributions will be announced month by month in THE AERO-MODELLER. The fund is now open, commencing with a subscription from the proprietors of THE AERO-MODELLER of fifteen guineas. This is a splendid chance for the aero-modellers of this country to support our Air Force in a practical manner, and we look forward to subscriptions from many individuals and clubs throughout the country and . . . from members of the trade as well.

We do not know what is the cost of a "Spitfire," but it is several thousand pounds. That should not dishearten aero-modellers in this country, in fact it *must* not dishearten them! There are hundreds of ways in which subscriptions can be raised, and it is now up to club secretaries and club officials to organise throughout the coming months the various means which must be known to them for collecting funds.

We feel that it is our duty in concluding our observations on the formation of this fund to remind aero-modellers of the considerable assistance they have had during recent years from the Air Ministry and members of the R.A.F. Many aero-modellers have visited R.A.F. aerodromes to fly their models and have received much courtesy, information, and interesting education in aircraft from all ranks. *Now* it is their turn to "return the compliment."

What a fine thing it will be to publish in THE AERO-MODELLER a photograph of the "S.M.A.E. Spitfire" . . . as Mr. Morrison says, "go to it" aero-modellers!!

Subscriptions may be sent either to the offices of THE AERO-MODELLER, Allen House, Newarke Street, Leicester, or to Mrs. McQueen, c/o Kanga Aeromodels, 1 Colonnade Passage, Birmingham. Cheques and postal orders should be crossed, and endorsed "S.M.A.E. Spitfire Fund."

Supplies of "The Aero-Modeller."

We have recently had quite a number of complaints from readers that they have been unable to get their copies of the last two issues of THE AERO-MODELLER. On investigation,

we have found in every case that readers have moved from one part of the country to another. Now, some months ago, we explained that, due to the need to conserve paper, an order had been made by the Paper Control that no extra copies of magazines were to be printed. This means that newsagents and model shops can only order copies against definite requisitions by their customers, and they must not order extra copies for a chance sale. Therefore, when readers move from one part of the country to another, it is most important that they should immediately transfer their standing order for THE AERO-MODELLER to a new newsagent in the locality to which they have moved. Provided readers do this, they may rest assured that they will regularly get their copies of this journal, but if they do not do this then assuredly they will be unable to obtain them!

With a view to assisting our readers, we are quite ready to make necessary arrangements as between the newsagents concerned, and, for the future, if any reader has moved from one part of the country to another and will send us his name and *new* address on a postcard, we will contact the nearest newsagent to his new residence and arrange for his AERO-MODELLER to be delivered to him.

For the convenience of readers we again print a newsagent's order form on the inside back cover page of this issue. If this is completed and passed to the reader's local (or new) newsagent, no difficulty will be experienced in obtaining regular delivery each month.

We have a small number of copies of the last two or three issues available, and those readers who require copies to complete their series of Volume V should order them now, direct from our Leicester offices, whilst our stock lasts. The price is 10d. per copy, post free.

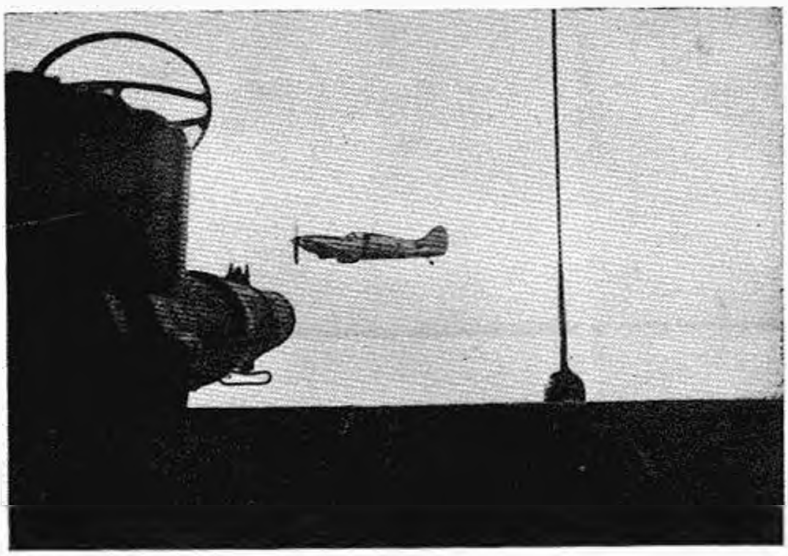
The Air Defence Cadet Corps.

It has not been possible after all to publish in this issue the results of the competition, held on August 11th, for the "Air Cadet" Cup, presented by this journal.

Our next issue will not only contain the full results, but a special report from a number of observers who were present at various points where this decentralised competition was held.

From the Air League of the British Empire, under whose auspices the Air Cadet Defence Corps is organised, we have received the following notice, which we gladly publish, knowing that if help is available it will immediately be forthcoming :—

Instructors are still required by Air Cadet Squadrons in and around London in various subjects. Would anyone willing to help please write to the London Area Controller, Air Defence Cadet Corps, Kinnaird House, 1a Pall Mall East, S.W.1.



Readers as Contributors.

It has long been our policy to encourage readers to contribute articles to these pages, as well as "Letters to the Editor." Admittedly, we *have* received one or two articles from so-called "free-lance" journalists—and sorry efforts they were—with their obvious recognition of model aircraft as "toys" . . . but we do not encourage them. Many of our most valuable contributions have been "first efforts" by readers who had no particular skill as journalists, but who *had* got an interesting story to tell. To us, that is the important factor when considering a contribution. We mention this point so that readers who have not before attempted to write an article will not be too shy. (Query?—is there such a person as a shy aero-modeller?)

Anyway, we would point out that our business notice, in which is given full instructions to contributors, is published on the inside back cover of this issue, which information may be considered as an invitation.

Tail-piece.

Our next issue will be a Special Autumn Number, with several interesting announcements and articles, including the first of a new monthly series of "Gadget Reviews," by Mr. C. A. H. Pollitt; two important articles by Messrs. Houlberg and Powdrill; scale plans of Mr. Mawby's Rotator IV, which has had to be held over from this issue. (No, master . . . . . we are NOT prepared to let you have an advance set of plans so that you can "put one across" the rest of your club) . . . but we have had to omit our usual detailed Contents List so as to get in the undernoted extract from a letter received from a reader who is on one of H.M. Destroyers :—

"I am sending you a photo of a model of a "Spitfire" which I built from a set of plans given in THE AERO-MODELLER. The model was suspended from the bridge of this ship in front of the Lewis guns. The film was censored in accordance with Admiral's Fleet Orders, and I was hauled up on the carpet by the captain to explain why I took photographs of aircraft."

. . . and so the Navy carries on!

P.S. Important.

During the past three months we have sold hundreds of plans of Copland 1940 Wakefield model, and we now remind readers that our competition organised in connection with this closes on August 31st next.

The full set of rules was published on page 302 of our May issue, and entry forms may be obtained from our Leicester offices on receipt of a stamped addressed envelope. Remember, there are nearly thirty prizes, and no entry fee, so all Wakefield "fans" who have built this 'plane should send their entries in as soon as possible.

D. A. R.

BIRDS' AND INSECTS' FLIGHT—

Svachulay's butterfly model flutters gently and gracefully, hovering over the ground like the real thing. The decorative finish makes it rather difficult to decipher the construction in this model, but others show this feature with greater clarity.

—SECRETS SOLVED

Bees, Bats, Butterflies, Gulls, Crows, Pelicans, Pigeons copied in models of Hungarian inventor

By **MICHAEL LORANT**

MEN have achieved undreamed-of perfection in building and flying 'planes, but the technical secrets of the flight of birds and insects have remained a sealed book to them.

Now a Hungarian inventor, Alexander Svachulay, has solved the mystery of flight by beating wings as crows, bats, butterflies and all the winged creatures fly. Fifty years' steady observation and speculation have yielded to him the secret of flying with the help of beating, flapping, fluttering wings, and the discovery may have a revolutionary effect upon the entire technique of flying.

Svachulay has presented at the Budapest Polytechnic a score of different models, each imitating exactly the flight of some bird or insect with uncanny precision. He has copied the structure of the wings and muscles of each animal with complete exactitude, and can set the simple rubber band propelled motor of his toy models at the exact speed, rhythm and type of motion that reproduce the flight of each insect or bird. This means no more and no less than that by means of Svachulay's invention mankind may at last hope to realise its age-old dream of flying by means of mere man-power, self-propelled as the birds fly.

The spectators were astounded to see Svachulay's varied models, which he has constructed to resemble also in outward appearance the winged types which they imitate. First

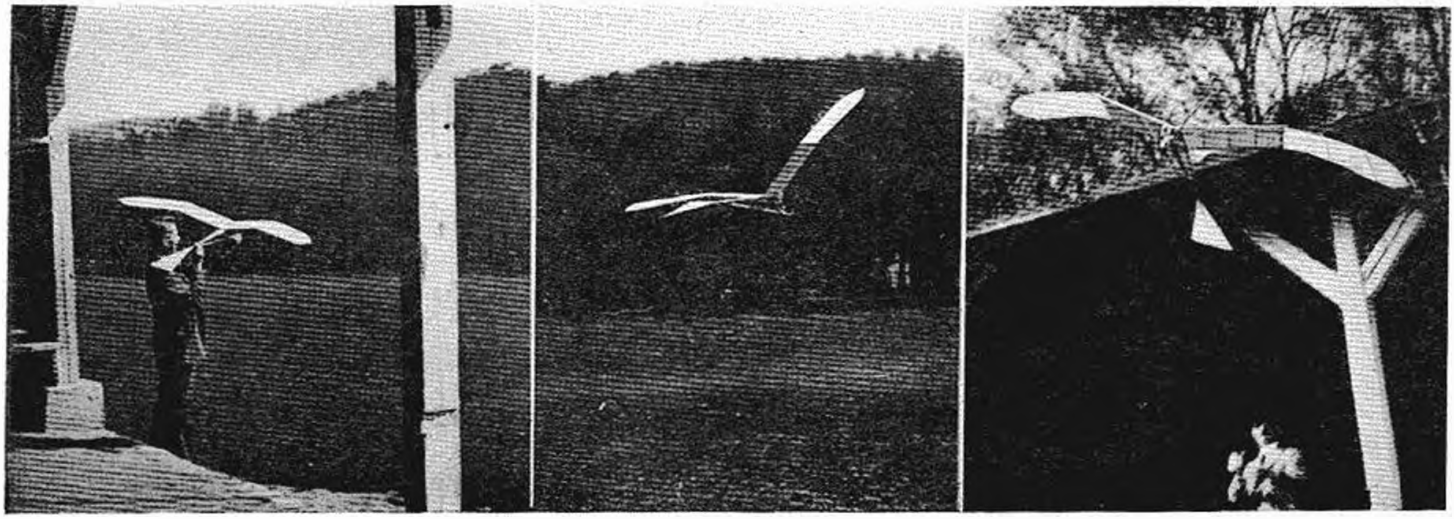
The inventor with his model of a bluebottle, which flies in perfect imitation of the motion of the insect it represents. We are told that even the buzz is there! The series of photos reproduced here were taken at a demonstration specially staged for THE AERO-MODELLER. *All models are propelled by rubber, and the universal use of a landing skid can be noticed.*

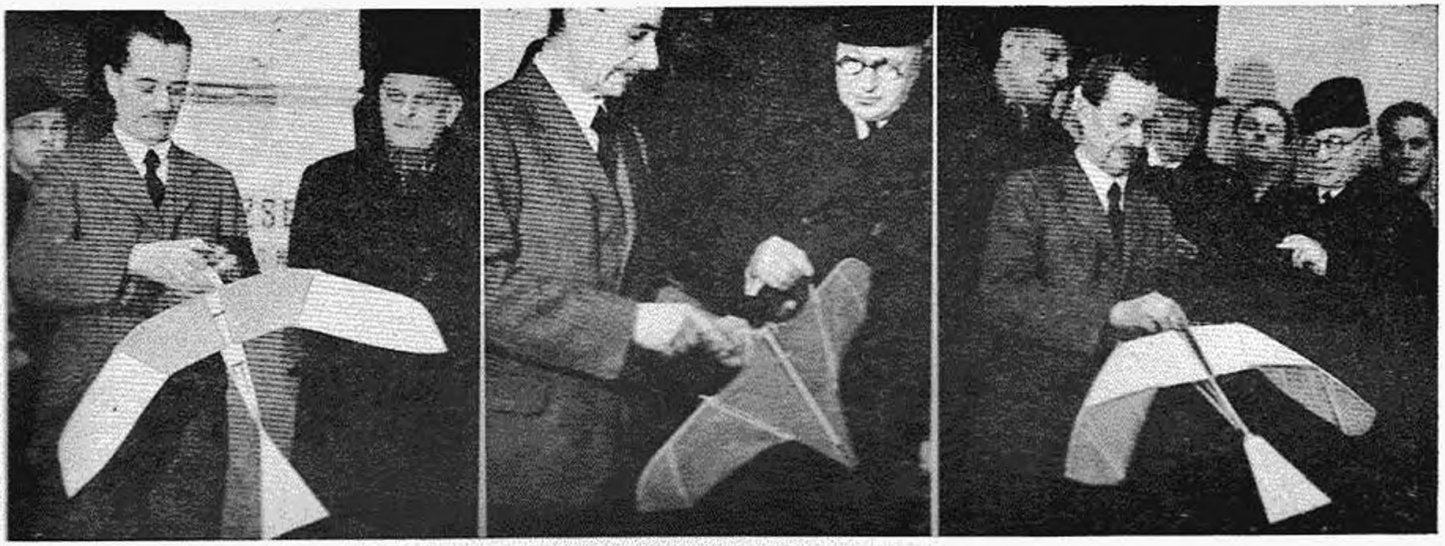
came a large fly, about 14 in. long, with protruding eyes and a life-like pair of black-marked wings. After winding up the primitive rubber-band motor, the inventor simply let the huge fly loose from the palm of his hand without throwing it into the air. The fly started off, buzzing like the real article, with exactly the same rapid fluttering of wings rendered almost invisible by the speed of its flight, for all the world like a real fly grown to gigantic dimensions on a diet of some unknown "Food of the Gods."

It was so life-like a performance that it almost took the spectators' breath away. The thrill continued when the inventor launched an enormous wasp, with wings folded across its back when at rest; next, a huge dragonfly, whose flight is one of the most complicated motions in nature, with its two pairs of wings in opposed, alternating motion. The fluttering of Svachulay's artificial dragonfly is precisely like that of the real insect. Then Svachulay launched a large painted butterfly, fluttering across the room with a gentle, graceful beating of its wings. Next came a crow, flapping its wings lazily with deliberation; a seagull, turning, dipping like a real one; a carrier pigeon, flashing straight and fast with rapid wing-strokes; an albatross with slow, well-balanced, swishing motion of the wings—each a perfect replica of the action of the living model.

Svachulay's models, known as yet to a small number of experts, will undoubtedly make a very big stir as soon as they become more widely known. After fifty years it looks as though Svachulay, one of the first enthusiasts for the cause of flying, would at last realise his ambition of a lifetime. As a simple mechanic, Svachulay was one of the pioneers of flying in Hungary. At the time when to stay up in the air for five minutes was a sensational achievement, Svachulay built a "dragonfly model" in which he went up and which he hoped to improve further. But he lacked the means to continue his experiments, and meanwhile the Wright brothers, Bleriot and the other trail blazers of aeroplane construction left Svachulay's feeble attempts far behind. Yet he was not discouraged and continued his studies of natural flight, based entirely on his own close observations of birds and insects, with the results that he is now about to present to the world, and which still remain to be practically exploited.

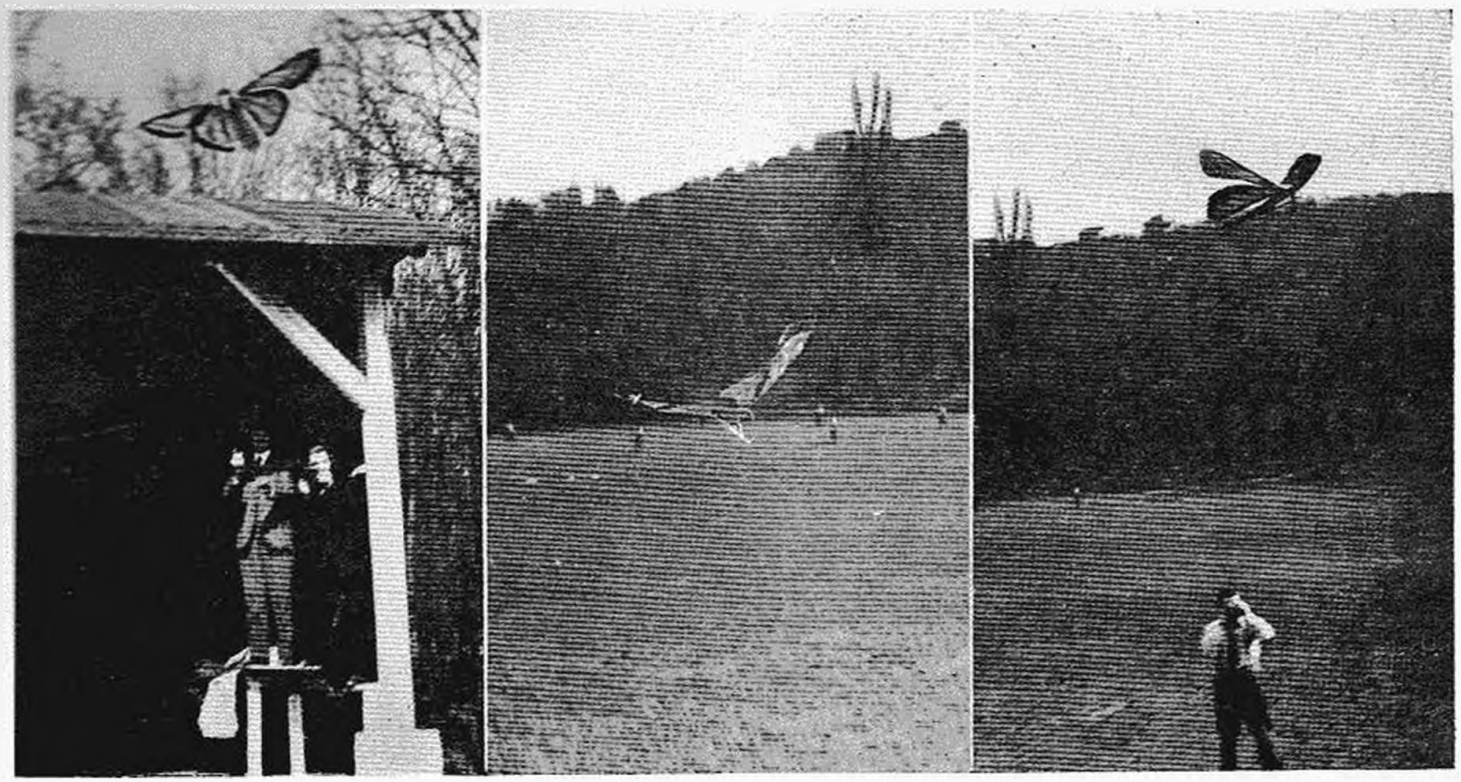
The flight of this model is slow, deliberate and majestic, as that aristocrat of the maritime skies, the albatross.

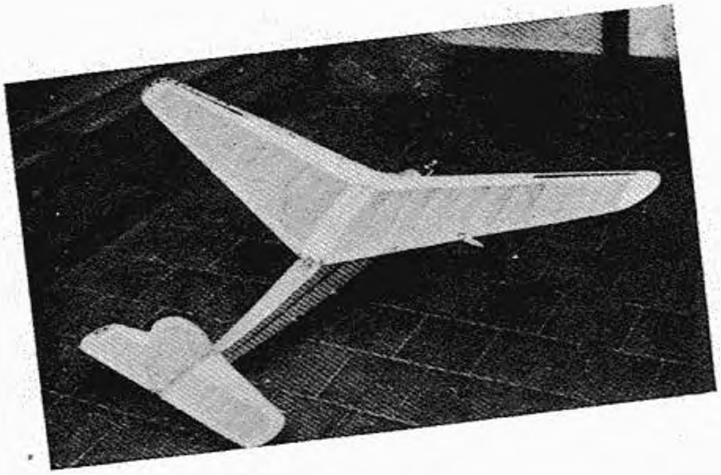




(Left to right) The Seagull model flutters, swoops and runs with all the grace of the real thing. While many models have been built on the seagull principle, these have usually been gliders, and this is the first instance we know of where successful ornithopter flight has been obtained on these lines. . . . The flat model shoots from corner to corner, with sudden alarming dips and swoops. (We know of a number of models similar in outline, but none that imitate the peculiarities of flight as this model does!) . . . The Cross flies "as the crow flies"—straight, slow and low.

Left to right: Three photos of the Dragonfly type in actual flight. Notice how the wings flex on the down beat, as shown in the open photo. No details or performance figures were submitted, but judging from the height, etc., we are inclined to think the unit is workable. Unfortunately, photos of a Dragonfly type were unfit for reproduction, but this is perhaps the most interesting and remarkable of the collection. Two pairs of wings move in opposed, alternating motion. Strachulay's first aeroplane model, constructed over forty years ago, was based on the dragonfly action.





FORESTALLING

By Lt.-Col. C. E. BOWDEN

(Left) The author's high-wing model with built-in wing-tip slots. This 'plane is very difficult to crash, and will sink on an even keel even when the main part of the wing is stalled. At right is shown the low-wing 'plane referred to in the article, which has similar characteristics to the high-wing 'plane.

STABILITY and flyability have always been my chief aims. I am never satisfied with a model aeroplane until it will fly with regularity and not suffer damage except through unforeseen circumstances such as flying into a house or a tree.

Apart from practical constructional features, the above ambitions demand great stability in the air, both when under power and in the subsequent glide after the power ceases. It is extraordinarily easy to produce a petrol-driven model aeroplane on the hit and miss principle that will fly sometimes quite well, but the real test of a model to my mind is that it will make flight after flight without damage to itself, and will meet the eventual air disturbance that is bound to offer itself, and will deal with it without a sudden dive, stall or side-slip into a spiral crash.

There are very few people that I know who can claim that they have got models that are really stable and *absolutely reliable*. Even a number of those who know quite a lot about models are satisfied with the occasional "unaccountable" crash.

As an instance of what I mean, I have known quite knowledgable men declare that a model is only correctly designed if it can fly on very little dihedral angle. I am quite prepared to admit that such a model with its side areas well balanced fore and aft and C.G. and thrust line correctly placed will fly well on the *majority* of its flights, but I maintain that sooner or later it will meet a really nasty air disturbance and it will not right itself before crashing if it is near the ground.

I prefer the model that has a *reserve of lateral stability*, even though it may not look quite so nice, and may rock a bit in gusty weather.

I *like* to see a model quickly righting itself in the air, provided it is not so badly designed that it merely sways from side to side all the time. Design the model really well, and then add a reserve of stability, and you have a model that will give you the great satisfaction of constant reliability.

And by the way, have you noticed how the fellows who really get away with the major petrol events *all* use pretty hefty dihedral angles, often coupled with a parasolled wing or polidihedral or both? Why is this? Because they know that a reserve of stability to meet anything is the thing that spells reliability, and reliability is the first essential if one is to win more than one or two events.

One must remember that the case of the rubber-driven duration model is a different proposition. One cannot afford to lose any spare lift due to excessive dihedral. A compromise has to be made. Even then reliability often demands more dihedral than some people will grant.

The petrol model can afford to use a more generous wing area and can therefore afford to lose a little lift for the sake of super stability.

I suppose one of the most troublesome and dangerous cases of instability is caused by a model putting its nose up into too steep a climbing turn. One wing tip stalls, the model drops a wing and goes into a spiral dive.

This even sometimes happens to full-sized machines with a pilot sitting at the controls who should know better than to let the machine stall. It has happened to certain American training machines bought by this country. These machines had tapered wing tips. They were cured by the fitting of in-built slit slots which kept control of the wing tips when the rest of the wing stalled.

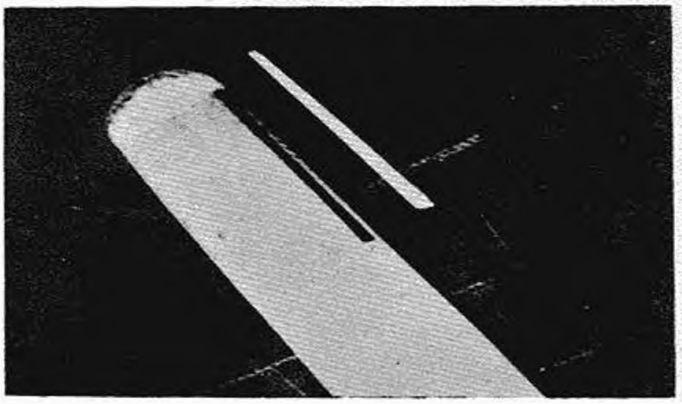
If these troubles beset a full-sized machine that should be kept under control, how much more likely is it to happen to the model that is a little out of adjustment fore and aft, and is inclined to nose up? Particularly a model with tapered wing tips, for these are known to stall *before* the centre section.

It is obvious then that we should take steps to prevent our wing tips stalling first. Let us make them stall last, and a long way last too!

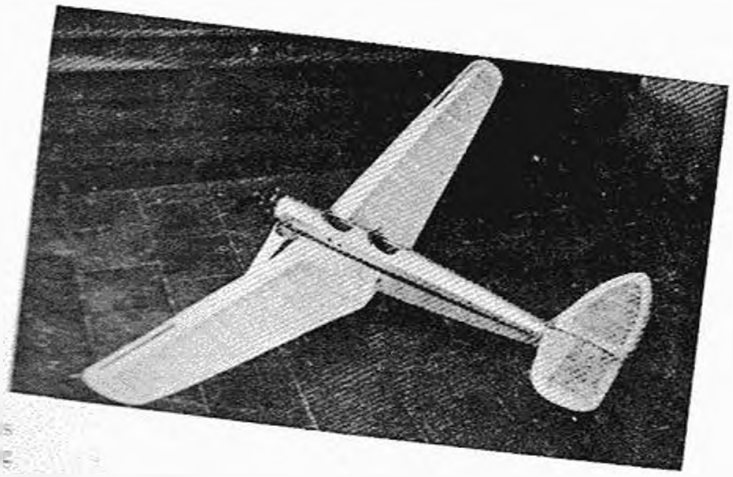
Some years ago I wrote an article in THE AERO-MODELLER on the discoveries that had been made with regard to the stalling of wing tips in the full-sized aeroplane world at that time.

Very briefly the facts are that a highly tapered wing stalls first at the tips and then at the root. A rectangular wing stalls at the root first and the tips last.

A highly tapered wing that has a straight leading edge



THE "STALL"



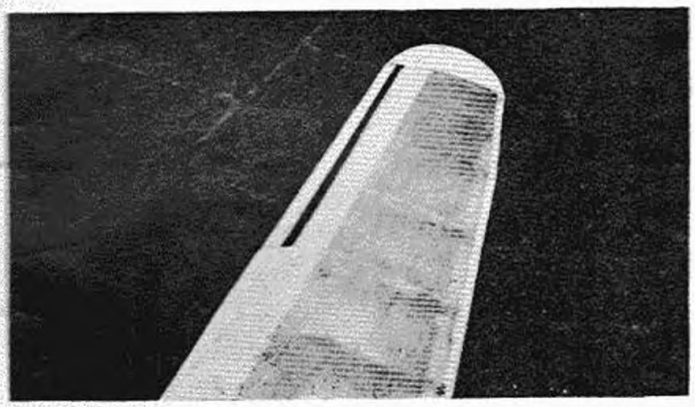
The two photos at the bottom show how the slat is constructed and fitted into the leading edge of the wing. The slat is made of balsa, and covered with silk and doped before being glued into position. The slat is of high lift section.

and has the trailing edge swept forward is not so vicious as one that has a straight trailing edge and the leading edges swept back.

For novices to model making let me also very briefly explain that a stall is a loss of lift due to the breaking down of the airflow over the top of the wing. There is from three to five times more lift on the top of a wing or the back of a sail than there is on the bottom of a wing or front of a sail, due to the low pressure area created by speeding up the airflow over the convex upper or back surface.

If the wing or sail is placed at too great an angle of incidence this airflow breaks down and the lift disappears. This is called a stall.

It is evident then that we must take steps to prevent this breaking down of the airflow. There are many people who even race sailing boats who are not really aware of these simple facts, and who imagine that the greatest forward energy or push is on the front of the sail. They do not visualise the more important airflow around the curved



back. They therefore do not use their opponents' airflow when trying to pass them. It is the same with the aeromodellist in many cases. He does not understand these simple facts, and as a result cannot hope to design his model really well.

There are several ways we can anticipate the breaking down of the airflow over our aeroplane wings, and we must remember that if we can prevent the wing tips from stalling we shall allow the wing to sink on an even keel when the rest of the wing stalls, for the tips will still have lift and be in control.

Amongst the main methods of keeping wing tip control even when the rest of the wing has stalled are :

1. Wing tip slots, either external or in-built.
2. Negative wing tip angles.
3. Sections at the wing tips that stall less easily than the main wing section.
4. Disruptor devices.
5. The much discussed and sometimes maligned lifting tail that prevents the nose from rising too high to stall the main wing.

All these methods I have experimented with, except No. 4, which I had intended to tackle, but the war intervened.

I noticed recently in THE AERO-MODELLER that the Ilkley M.A.C. had carried out some interesting experiments with regard to the Marriott-Randle Disruptor. I should be most interested if the experimenters could find time to write and tell me all about these valuable experiences.

Just prior to the war I determined to try out in-built slots on two models. Both these models were purposely built with highly tapered wings, and one was a low-wing model. Both were therefore likely to be troublesome over a wing tip dropping at stalling angles. Fig. 1 shows the high-wing model and Fig. 2 shows the low-wing model. The wing tip slots can clearly be seen in the photographs.

It has been proved in full-sized practice that this type of slot will keep the airflow going over the wing tips, and although always open, does not have any appreciable ill effect on the performance of the machine when it is flying on a level keel. These same characteristics are found on my two models. The models will fly quite normally on the limited engine power that they possess. These models are engined by a tiny "Atwood Phantom" and an "Ohlsson 23" respectively. They are both of very simple design and are built for purely experimental purposes.

One can purposely over-elevate either model to a remarkable degree. The models will put their noses right up, stall and yet sink on a perfectly level keel with perfect wing tip control. In other words, the wing itself stalls and sinks, but the wing tip airflow is kept going, and the wing tips do not get into a stalling position.

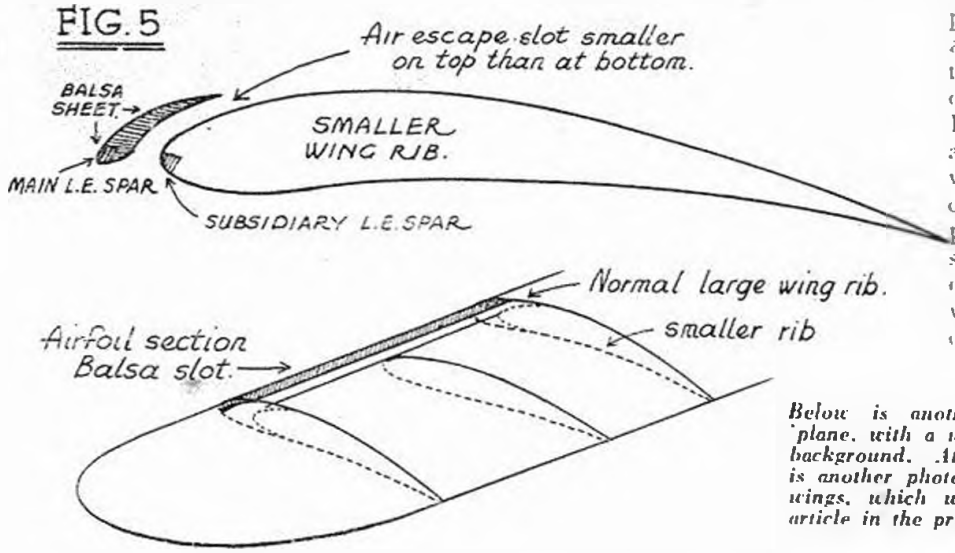
The beauty of the system is that it is extraordinarily easy to fit to any model, and there are no complicated operational devices as in the case of movable and automatic slots.

Fig. 3 shows how the wing is built. For about 8 in. to 10 in. before the wing tip the leading edge spar is carried in front of the decreased wing section. An airfoil sectioned slot is made from thick balsa sheet. This is then glued in position to the leading edge spar. It thus forms a slot between itself and the wing. The whole is carefully doped

and covered with silk to strengthen. Fig. 4 shows the airfoil sectioned balsa slot glued to the wing. Fig. 5 shows the construction of the in-built slot.

It must be mentioned that only the best results will be obtained if the model is carefully balanced by the side area shown fore and aft above the C.G. Fig. 6 shows the high-wing model. The fin can be clearly seen and the dihedral angle can also be seen. These two are nicely balanced and the model has a good leverage arm, i.e. the tail-plane and fin are well away fromt he main-plane.

FIG. 5



The background may interest some readers. The hill in the distance is the famous " Queen of Spain's Chair " in Spain. It was from this hill that a Queen of Spain viewed an early siege of Gibraltar. She is reputed to have said that she would not leave her chair until Gibraltar had been taken. In the end, however, she developed sitter's cramp and gave up the idea.

I shall lightly pass over the second method of keeping wing tip control until the last moment. So many aero-modellers have used negative wing tips, and most of them understand the advantages and disadvantages of this system.

Method No. 3 is interesting and often used on the large German model gliders with considerable success. A different wing section is used at the wing tips. The section stalls at a greater angle than the section of the rest of the wing. It therefore stalls later.

I always remember that Mr. C. R. Fairey, who in peace-time was always so kind to aero-modellists in allowing them the use of his grand aerodrome near the Great West Road, was looking at one of my early petrol models, and he asked me why I did not try this method. Naturally I did after that. It may be remembered that Mr. Fairey, who now is one of the largest aeroplane producers in this country, started his early days by flying model aeroplanes.

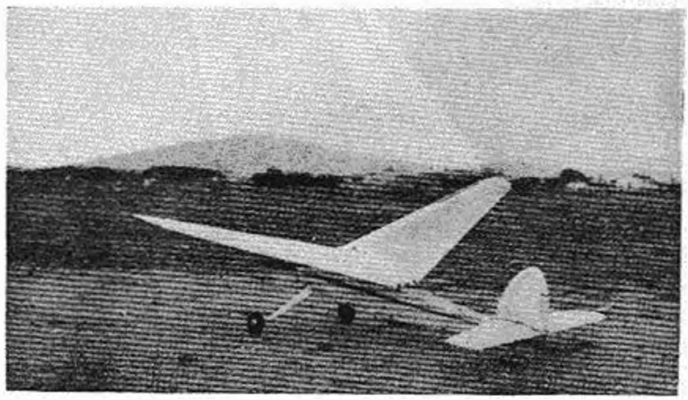
When I started off with the first post-war (1914-1918 war) petrol model that flew I was given permission to use Mr. Fairey's aerodrome. I then invited a few friends to fly with me after I had obtained permission, and people came to see our efforts. This grew slowly, and more model enthusiasts used the aerodrome through the kindness of Mr. Fairey until some of the largest model aeroplane meetings in this country were held at the now well-known "Fairey's." I had nothing to do with these meetings taking place on this marvellous field, except that my original efforts were the reason for those early visits of the " old hands " who then saw the possibilities of the aerodrome. But all this is by the way.

Lastly, a word about method No. 5. A lifting section tail-plane if set at no angle of incidence will produce slight lift as a rule, but as it is set at a lesser angle than the main-plane it will come into a good angle of lift when the main-plane is arriving at a dangerous and stallish angle, or even a definitely stalled angle. If the lifting sectioned tail-plane is set well away from the main-plane on a long moment arm it will obviously exert a powerful and quickly operated leverage and bring the tail up, thus replacing the main-plane at a lesser angle of incidence and so restoring its even airflow. If the combination of a lifting tail-plane and slotted wing-tips is used there is very little likelihood of a dangerous stall or a dropped wing. The lifting tail-plane should be of a thin section and it should not be flown at a very great difference in angles of incidence, otherwise it may " take charge " and cause a dive that is difficult to recover from.

Below is another view of the high-wing 'plane, with a well-known Spanish hill in the background. At the top of the opposite page is another photo of the 'plane with elliptical wings, which was described in the author's article in the previous issue.

The lifting tail-plane has been much used on rubber models in the U.S.A., and helps to permit some of the terrific climbs with overpowered elastic motors that the Americans use.

I remember how in the early days of model flying the lifting tail-plane was the cause of much bitter condemnation by so many of the " experts." This is always the way with anything out of the ordinary.

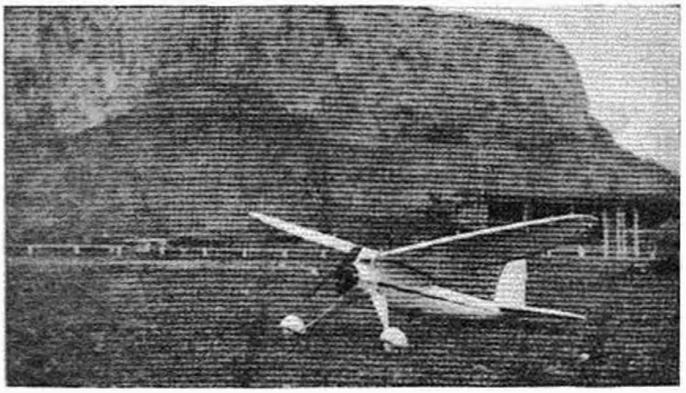


Some people may remember the marvellous and almost vertical climbs made by Mr. Willis, Senior, in the early days on Wimbledon Common. His " Sky Rover," as he called his spruce and silk, twin-geared model, used to rear up on an enormous amount of rubber, and instead of stalling at the top of the climb the model would level out beautifully. He used a lifting cambered single surfaced wire-framed tail-plane. So did I on my elastic models, and was heavily criticised. I also used it on the first post-war flying petrol model. I remember writing an article on this type of

tail-plane in those far-off days. I think if I remember aright the theories were not really quite correct. But so many people's theories were shaky in those days of early experiment!

A properly used lifting sectioned tail-plane combined with negative, or different sectioned wing tips, or better still with the in-built slots I have described, is the best anti-stalling combination I know of up to the moment of writing.

But the delight of this model business is that we are always progressing, so who knows how we may advance? I only wish the war had not so badly cramped my experiments. For those in a position to do so I strongly urge you to carry on with the good work of experimental building and flying, and to tell us of the results.

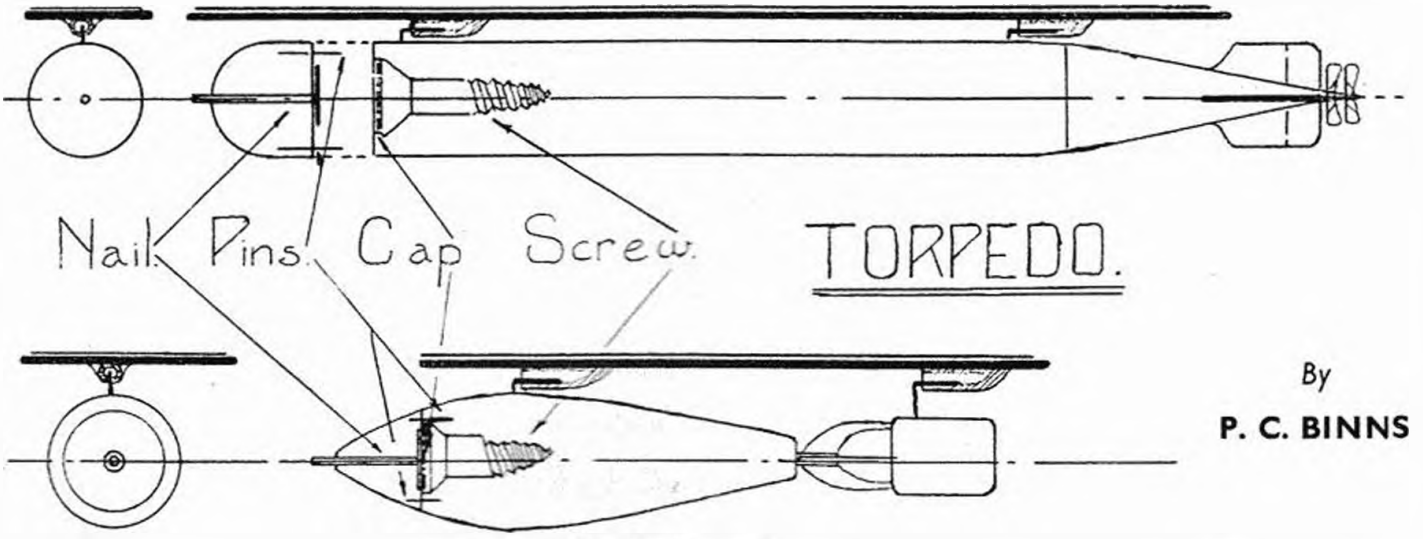


YOUR FIRST PROPELLER

By A. PEGG

THE carving of your first propeller need not be a tiresome chore if the work is done intelligently and systematically. The time will actually be shorter in many cases, as the propeller will be balanced without trouble. Try the following system on your next carving job: Carefully blank the propeller block in pencil. Drill the shaft hole while you still have a rectangular cross-section to provide a parallel for the drill. Cut the blank to the exact pencilled outline. If you did the work carefully the blank will balance. Next cut the under camber portion so there will actually be no under camber, but a flat surface. Now mark with a pencil line the point of deepest camber, about 35 per cent from the leading edge. With the point of the knife cut in very slightly along this line, and be sure to match both blades equally. Now cut out the front, or the 35 per cent portion of this cut-in. When the front portion is cut deep enough, cut away the trailing or 65 per cent portion. You cannot help but get the correct under-camber. The propeller should now be in balance, with both blades having identical under-camber characteristics. The lower camber can be completely finished with sand-paper. The upper camber is guided by the lower. As soon as you come to the dangerous thickness, stop, and start carving a slice at a time with in-between feeling with fingers for the blade thickness. You will be surprised to find how well your fingers will detect true or false airfoil section. The result of using this method of definite stages will be a guarantee that your propeller has equal camber, thickness and outline of both blades.

EXPLODING DEVICE for MODEL BOMBS and TORPEDOES



By

P. C. BINNS

HAVE you ever, when taking your cute little Westland Lysander out for its ration of ether, encountered one of those superior persons who continually try to pick your model to pieces? (metaphorically, of course!) He spies the dinky wee bombs nestling under the racks, and pointing with a derisive digit, says, "Bai George! Rather futile, don't y'know? Dinky little bombs and all that, but *don't they work?*"

Then you, shaking your head with a tear in your optic, slink away to your sackcloth and ashes and despondently turn over the pages of this esteemed magazine. Then, stun my sister with a sausage, a light comes into your bleary eye (contravening all black-out rules and regs.); you throw away your sandbag and sand (good substitute for ashes, believe me) and repair to your bench to work feverishly till the small hours of the a.m. Why? Because, my morbid, mourning, motley mob of modellers, you have espied the inspired device of yours truly. Next time you see the S.P., and he again points with a derisive digit, you, with a raucous imitation of a Bronx cheer, throw, bung or otherwise project your flapper into the stratosphere and pepper the S.P. with little banging bombs (sharp pins to stick into the tender parts of the S.P.'s anatamoy may be added at the owner's discretion).

How does this miracle come to pass, you ponder? Then transport your watery gaze to the accompanying drawings and the device will be as an open book. (Not upside-down, you twirp!)

And now to get down to brass tacks. You need—no, you'll never guess—yes—no—a brass tack, or any other kind of flat-headed nail, a screw, and an amorce or percussion cap.

The bomb is first made from balsa by using a lathe. A screw with a head slightly larger than the cap is sunk into the headless body (brrr) of the bomb. A nail is passed through the hole in the head of the bomb and acts as a detonator. Small pins are introduced as shown in the diagram to hold the head and body together. (No, young Robinson, this is not an undertaker's). The cap is situated between the nail and screw, which provides a hard striking surface and a weight at the front.

When the bomb hits the ground (or the S.P.) the nail is given a sharp blow, which explodes the cap, causing 'arty laughter from the onlookers.

Various methods of dropping bombs have appeared from time to time in THE AERO-MODELLER, and may be used. I find, however, that the method illustrated is as good and as simple as any. The bombs are each provided with two small hooks fitting into two lengths of aluminum tube. As the machine is diving, at the end of its flight the bomb slips out under its own weight and falls to the ground. The bombs may be used over and over again by simply renewing the cap, and should therefore appeal to all Scotsmen present!

ENLARGEMENT OF PLANS FOR SOLID SCALE MODELS

By **S. T. BROWN**

ONE of the chief bugbears of the ardent solid scale model builder is the lack of the requisite plans. In kits marketed by the manufacturers he has his plans from which to work, but further he can do nothing, for he cannot hope to possess sufficient information on the various types to enable him to draw up his own plans. The popular aviation magazines often publish plans of commercial and new military types on a very small scale, which means that the builder is able to use them, provided he is able to enlarge them to any desired scale, for there is no sense in constructing solid scale models with an overall length of only about three inches, as this leaves very little room for detail, thereby losing realism.

With a little practice, however, the enlargement of plans becomes very simple. Once the procedure is mastered, the work proceeds rapidly, and very accurate reproductions are obtainable. The plans may, of course, be increased or decreased in scale.

The first step is the "squaring-off" of the original plan. (Front and side views, and plan, are obviously essential.)

A reference line is drawn on the plan, generally through the centre of the propeller spinner, to the lowest point of the tail-skid or wheel.

Now comes the actual "squaring-off." This consists of drawing lines, perpendicular to the reference line, through all important curves. Where more intricate curves and details have to be reproduced, such as wing-tips, undercarriage and tail assembly, it is advisable to draw more perpendiculars than on the other sections. Once this has been done, lines are drawn parallel to the reference line, and the "squaring-off" is completed when this has been done to all three views.

The next step, the redrawing of the lines drawn over the original plan on the new scale, is the simplest in the whole operation. The lines are measured, increased (or decreased) to the scale required on the new plan, and redrawn. In measuring these lines, and in fact all lines on the plans, it is advisable to use dividers. If absolute precision is required, each line may be measured over three times, and the average result found.

Now that the "squares" have been redrawn comes the most difficult part, and one which you are advised to practise as much as possible. Using the ruler and dividers once again, and utilising the new "squares" for comparison, draw in the curves and other details from the original plan, increasing them to the predetermined scale. You will find that, by increasing the number of "squares," you are able to complete this part of the work much more accurately and easily.

When all the lines have been redrawn, check over your measurements once again, to ensure accuracy. Then go over the lines of the new plan heavily. Construction lines may be lightly erased, or the plan may be completely redrawn in its new scale if a clean or exhibition copy is desired, when it will be ready for use in building your solid scale model.

MONOCOQUE FUSELAGES

By A. PEGG

THE first step is to decide on the cross-section shape. Round is best. If you need room for two motors, use elliptical. If you want irregular shape, you will have to plot out individual bulkheads. The second step is to draw full size plans and side views, which provide the major and minor axes. Use the approximate method for developing elliptical bulkheads. For ever changing cross-sections, draw two outlines of the largest bulkhead over which are superimposed the smallest end bulkheads. Count the number of intervening bulkheads and space them between the two extremes.

The elliptical and varying cross-section bulkhead outlines are drawn on stiff paper. To transfer the outlines to balsa, trim and smooth the paper to the first or largest bulkhead. Circumscribe the outline on balsa, and an extra one on paper to keep the outline for future use, or if the bulkhead breaks. Cut away to the next outline and carry on. In transferring the outline to balsa, be sure to have vertical and horizontal reference lines on balsa over which to superimpose the pattern. The circular bulkheads can be outlined directly from drawings by compass.

The bulkheads can be single balsa sheet, providing that balsa is fairly heavy, and of "C" or quarter grained, to provide the stiffness. Rigidity counts mostly during assembly. Once the job is completed the cemented junctions between the bulkhead and planking provide the "T" section. No stringers are needed if model is planked with $\frac{1}{16}$ in. or thicker planks. 1-20 or under covering require stringers for cementing surface. It might be mentioned that it takes twice as long, with poorer results, to cover with thin sheets than it is to use planking. Since single sheet bulkheads are liable to crack if cut with razor: a fine scroll saw is just the thing.

The assembling is begun by using two $\frac{1}{16}$ in. × $\frac{1}{2}$ in. master planks on which the bulkhead spacing are marked. (2 in. spacing seems the maximum allowable). Tack to the strips with cement the two bulkheads which are on either side of the largest. Be careful in doing this, as it forms the base for the entire structure. Check up for line-up of two strips by bringing the ends together, and pinning them temporarily while the rest of the bulkheads are cemented into place. With all bulkheads in place start planking. (Plans should be of light and soft balsa). Begin by cementing top and bottom, to prevent twisting or curving. To cover angles, just measure the length of the angle to the point where the width equals the plank width, and cut a straight angle. The softness of the wood will allow a certain amount of jamming and so fill cracks.

While planking be sure to mark all cut-outs deeply, such as for wing mountings, and also cement in all wire fittings to the bulkheads with plenty of cement. When planking is complete, sand with medium paper as long as the planks resist sanding or have no light spots. Final fine sanding after a light coat of dope. Cover with paper, light colour preferred, as dark colour will show up junction streaks, and also cover up the natural wood grain, coat with six applications of banana oil, with final fine sanding and waxing. The banana oil is best, as it dries with lightness and is rock hard. You now have a light fuselage, which will take 40 strands of $\frac{1}{8}$ in. rubber with ease, even if they smash back. After a while you will find parts of the bulkheads missing without any weakness showing up. Or, after a series of head-on smashes, the front might weaken and crack off, but you just fit it back and smear it with cement. The model will be ready to fly again as soon as the cement dries.

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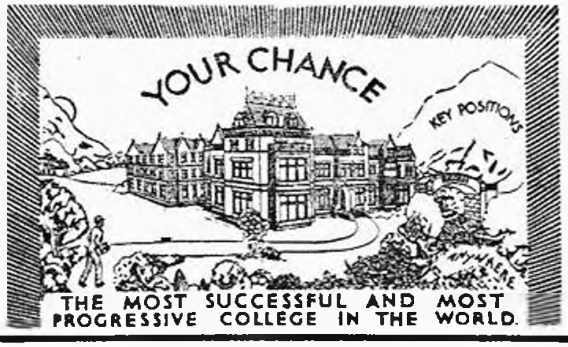

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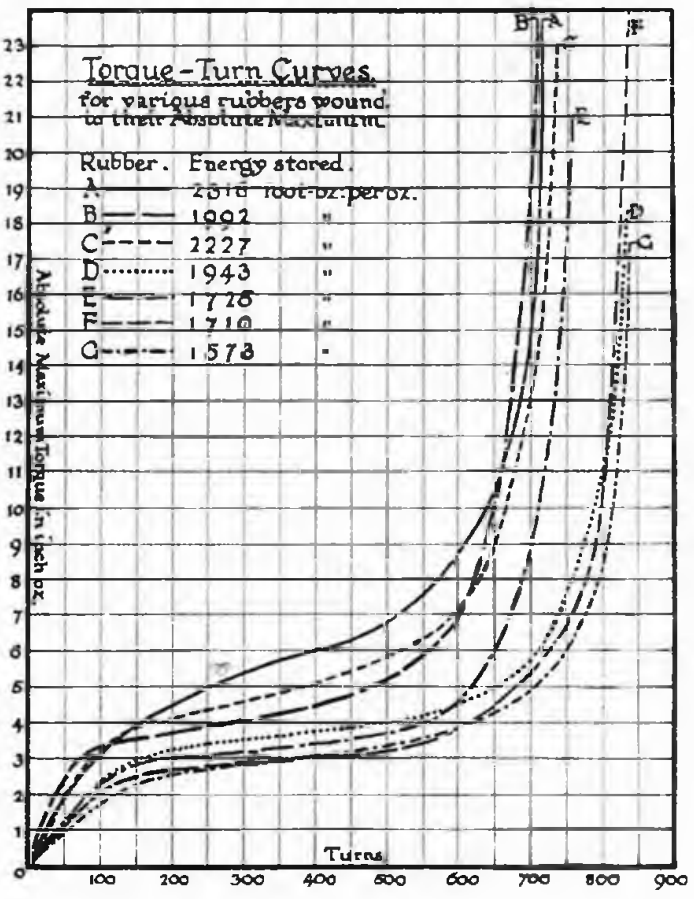


THE TESTING OF

By

A. H. W. MacBEAN and E. J. POWDRILL

AFTER noticing the great variations in performance of some models when using different kinds of rubber, the writers decided to conduct some accurate tests on the amount of energy stored by various rubbers, this being the only way of obtaining a true comparison of their efficiency.

The testing apparatus was quite simple and was constructed in the following manner. First a board of ordinary deal about 30 in. × 6 in. × $\frac{5}{8}$ in. was taken and clamped to one corner of a table, as shown in the sketch. To this was affixed a stiff metal bracket complete with bush, hooked shaft, ball race and clutch. The clutch engaged a balancing beam threaded on the front of the shaft. This beam was of birch, 24 in. × $\frac{5}{8}$ in. × $\frac{1}{4}$ in., marked off in inches and one-tenths of inches on one side. Then three weights were made, complete with loops to slip over the beam, weighing 2 oz., 1 oz. and $\frac{1}{2}$ oz.

To test some rubber a motor of standard size was used. In our case this consisted of 1 oz. (6 yards) of $\frac{1}{4}$ in. × 1/30 in. flat strip made into four strands, tensioned by winding on 100 turns and doubling it, thus making an eight-strand motor 27 in. long which would remain taut between hooks 18 in. apart when unwound.

One end was attached to the rubber hook by means of a bobbin and the other was hooked on to a drill. The motor was then very carefully run in with five pre-winds of 200, 300, 400, 500 and 600 turns. According to the formula given by R. M. Glass in THE AERO-MODELLER of March, 1938, the maximum turns for a motor of this size lubricated and stretch-wound is 702.

This formula is:

$$N = \frac{K \times L \times \sqrt{L}}{\sqrt{W}}$$ where N = number of turns.

K = 5 for lubricated and stretched rubber.
L = untensioned length of motor in inches.
W = weight of motor in oz.

$$\therefore N = \frac{5 \times 27 \times \sqrt{27}}{\sqrt{1}}$$
$$= 702.$$

Our first series of tests was on seven different makes of rubber all wound to 90 per cent of the theoretical maximum, i.e., 640 turns.

These were each taken one after the other and wound in the correct manner to this amount, the drill then being held on the board so that the rubber length was 18 in. The torque was now measured in in. oz. by sliding a suitable weight along the arm of the beam until it just balanced the torque of the motor, this being noted down by the person operating the balance. Turns were then let off from the drill end by the winder, stopping at intervals to read off the torque. The results were tabulated, as shown by this typical example.

RUBBER "B."

TURNS	TORQUE in inch oz.	TURNS	TORQUE in inch oz.
640	21·05	320	4·2
620	14·0	280	4·1
600	10·9	240	4·1
560	7·7	200	3·7
520	6·4	160	3·8
480	5·85	120	3·75
440	5·05	80	3·35
400	4·7	40	1·95
360	4·48	0	0

This procedure was repeated with each sample, care being taken to see that the time intervals between the readings were the same in all cases.

The figures obtained were plotted on graph paper and the points joined by smooth curves, as shown in Fig. 1. The energy stored by the rubber is proportional to the area underneath the curve, for instance:

1 sq. centimetre = 50 turns × 1 in. oz.
" " = $50 \times \frac{2\pi}{12}$ in. oz.
" " = $50 \times \frac{2\pi}{12}$ ft. oz.
" " = 26·15 ft. oz.

By measuring the area under the curve by counting the squares, or any other method, the total energy stored can

RUBBER MOTORS

We are pleased to announce that Mr. A. F. Houlberg, Chairman of the S.M.A.E., is preparing an article entitled "Designing your 'Plane to Suit the Power Available." Mr. Houlberg also is conducting experiments with various grades of rubber, and in this article he will explain how it is essential for the aero-modeller to study the power output curves of the brand of rubber he is going to use in his 'plane when working out its design.

be calculated by means of this relation. For obvious reasons it is impossible for us to publish here the names of the makers of the various samples of rubber tested, but those interested can easily make similar tests for themselves. The differences, as can be seen, are remarkable, and it is notable that the rubber having the highest initial torque does not necessarily store the most energy. The energy stored determines the duration of your model, other conditions being equal. For instance, a hypothetical helicopter of 100 per cent efficiency, weighing 10 oz. and containing 1 oz. of rubber would climb to a height of 204 ft. using rubber "A" and only reach 116·6 ft. on rubber "G." If its sinking speed was 3 ft. per sec. and the time of ascent was the same in both cases, the difference of the durations would be 29·2 sec., which is quite considerable.

A second series of tests was conducted in which the rubber was wound as near as possible to the absolute maximum, determined by experience. The results of these tests, treated similarly to the first series, are given in Fig. 2.

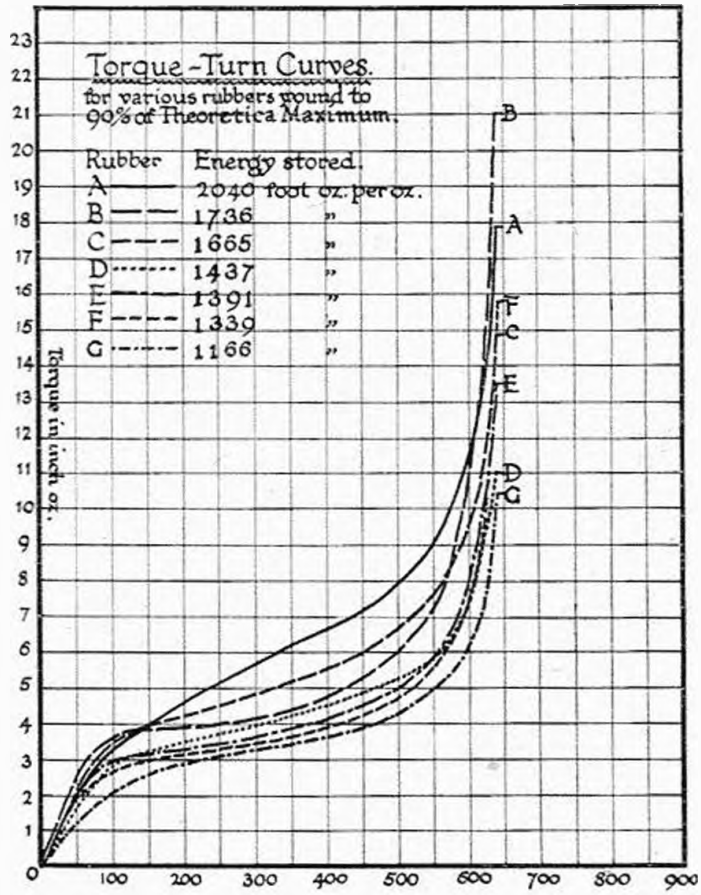
Here it was observed that certain of the rubbers which stored less energy in the first tests were capable of taking a much larger number of turns, but this did not necessarily increase the energy they would store at absolute maximum turns beyond that of the other rubbers which could not be wound so far.

The first desirable factors in rubber can therefore be summed up as follows:

(1) Capacity for storing large amount of energy.

(2) Low initial torque.

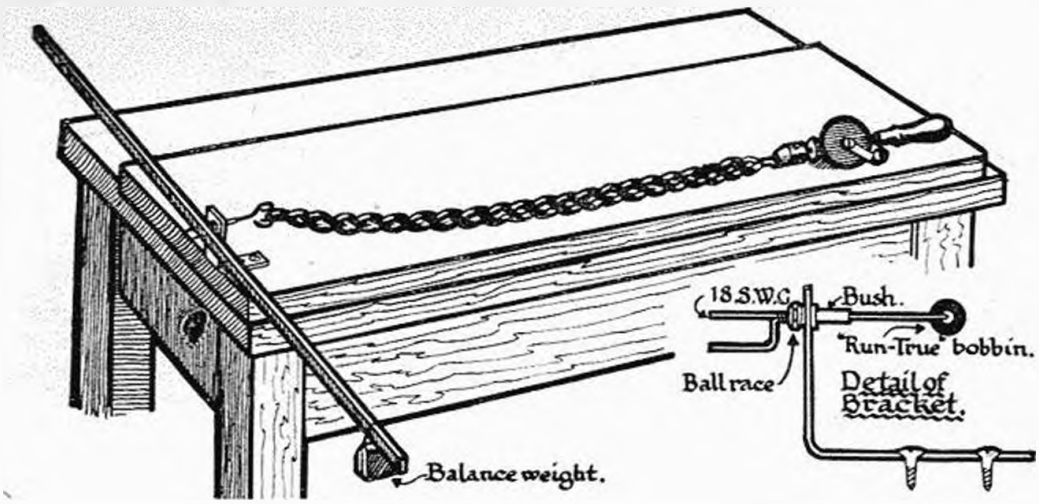
Usually a compromise between these two is reached, but in the case of rubbers having a very high initial torque it is suggested that if the first 20 or 30 turns are let off before the model is released the torque will be nearly halved, as



can be seen from the figures given. This will enable a larger motor storing more energy to be employed than would otherwise be possible, and the duration may thus be increased.

In these tests the absolute maximum turns were in all cases more than the theoretical maximum obtained from the formula given above where K = 5, as this figure is on the safe side. For some rubbers the value of K can be increased to nearly 6, but the exact value for each particular type of rubber must naturally be determined by experiment.

It is hoped that this information may help people to find the most suitable rubber for their needs and to make the best use of it.



In this sketch is shown the apparatus by means of which the torque of a rubber motor is measured. The beam on which the balanced weight is adjusted must be accurately graduated.

WING EFFICIENCY —

ALL model aircraft constructors and designers are no doubt aware that lift on an airfoil section is due to the difference in pressure on the upper and lower surfaces. A common error, however, is to assume that there is a "suction" on the top surface: this is not the case, as there is only a slight decrease in pressure, which still remains a positive pressure; or, in other words, some presure slightly less than 14·7 lb. per sq. in., or atmospheric pressure at ground level. This lowering of pressure is due to the "venturi" effect, and is a similar action to that produced in the choke tube of a carburetter, due to the fact that pressure varies inversely as velocity; or, to put it more plainly, if the velocity of the airstream is increased the pressure is lowered.

If we look at Fig. 1 we see the cause of the pressure drop. Since the air that previously flowed through gap AB must now flow through gap CD, thus the velocity increases and pressure decreases, so that for this we may deduce that where airfoil camber is greatest the pressure on the top surface is least.

The pressure on the undersurface is, of course, a different story; this is due to the mass of air which must be deflected into a downward path, depending on the angle of incidence, thus giving an upward reaction or pressure on the airfoil. You can now see why some airfoils will produce lift even with their datum lines set at 0° to the flight path, and may deduce that at this angle it is due almost entirely to the top surface.

In recent tests on airfoil sections at low speeds in the N.A.C.A. wind tunnels, it was seen that break-away of the air-flow over the top surface occurs at smaller angles than for high-speed tests. When choosing model airfoils, therefore, from high-speed data, it should be remembered that those with L/D maximum at small angles of attack, or with the largest range of angles between L/D maximum and stalling angle are the most likely to remain similar in low-speed flow. This would seem to explain the popularity of Clark Y and R.A.F. 32, and also the fact that L/D maximum for most full-size sailplane sections often occurs at negative angles of incidence, examples being Gottingen 535, 387 and 549. The first of the Gottingen sections being a very popular section on sailplanes, which can be considered as low speed flow, it should be quite interesting to test it on a model.

It does not require great brain power to see that at the wing tip there is a merging of pressures between the upper and lower surfaces of the airfoil, tending to return to atmospheric pressure. There is, of course, a loss of lift due to this merging which is known as "tip loss." Naturally, the larger the tip the greater is the loss; therefore, for a given area, the greater the aspect ratio the less will be the tip chord, and hence tip loss. For this we can see that C_L increases with aspect ratio.

This tip loss now leads to the question of induced drag. As the pressure on the top surface of the wing varies from slightly below atmospheric at the centre section and tends to rise at the tip, due to the merging with the high pressure on the lower surface, we get a slight rise in pressure from the centre section to the tip, and as air always flows from regions of high pressure to regions of low pressure, we tend to get a flow of air from the tip to the centre section on the top surface which tends to deflect the airflow in that direction. (See Fig. 2).

The reverse occurs on the lower surface of the wing, since the increased pressure at the tip has merged with the decreased pressure on the top surface, so we get a slight drop in pressure from centre section to the tip, and consequently a flow outwards towards the tip. Hence we arrive at a flow known as "three dimensional flow," i.e. (1) backwards over the airfoil, (2) downwards, due to angle of incidence (known as down-wash), (3) inwards or outwards (according to the surface considered).

Where the two types of flow due to (3) cross at the trailing edge a whirling motion is set up which, from tests, is known to have its centre at the wing-tip. These are known as "trailing edge vortices," and have the effect of producing an up-wash in all air currents outside the wing-tips and a down-wash to all air currents inside the wing-tips, and as there is already a down-wash previously given as flow (2), these vortices increase it, most noticeably at the tip. This has the effect of reducing the angle of incidence, and as this is most noticeable at the tip, full-size aircraft can keep their aileron control almost to the stalling angle, since the tip stalls last, due to its greater decrease in effective incidence. To explain this more fully, we will suppose we have an airfoil which we wish to set at 2° to give us the desired lift, but included in that two degrees is a 1° down-wash, so that 1° of incidence is our effective incidence, and is actually giving us our lift, whilst the other 1° is to counteract down-wash due to vortices and other causes, so that if we can get rid of this down-wash we may set our airfoil at 1° incidence instead of 2°, and get our desired lift at a smaller angle, and hence smaller C_D and drag.

Since tip loss, and, from this, trailing edge vortices, become less as aspect ratio increases, we can reduce drag and keep our lift by increasing the aspect ratio and reducing our angle of incidence. I will now show how this can be calculated. The down-wash velocity is sometimes known as "induced velocity," and gives rise to "induced drag," the coefficient for which has been found to vary as $\frac{C_L^2}{\pi R}$ where R = aspect ratio. Also we know that the drag on an airfoil at any incidence consists of a constant drag known as "profile drag" and a variable drag known as "induced drag," or in other words $C_D = C_{DP} + C_{D_i}$, where C_{DP} is the profile drag coefficient and C_{D_i} is the induced drag coefficient. But we know that $C_{D_i} = \frac{C_L^2}{\pi R}$, therefore $C_D = C_{DP} + \frac{C_L^2}{\pi R}$.

Now to calculate the reduction in drag and angle of incidence due to an aspect ratio increase we will assume we know the characteristics of an airfoil at a certain aspect ratio, R_1, and a certain angle of incidence, z_1. Knowing C_L and C_D at this incidence, we can find C_{D_i} from formula $C_{D_i} = \frac{C_L^2}{\pi R}$ and, subtracting from C_D, gives us C_{DP}. This will be the same for both aspect ratios. Now calculate C_{D_i} due to new aspect ratio R_2 with the same C_L value as for previous aspect ratio, and add to C_{DP} value previously found, and this gives us our new C_D, which will be found to decrease for an increase of aspect ratio.

Now, since induced drag has been lowered, the induced velocity or down-wash must be less, so that a less angle of incidence, z_2, will give us our new values as previously explained. This may be found from $z_2 - a_2 = 18{\cdot}25\ C_L \left(\frac{1}{R_1} - \frac{1}{R_2}\right)$

It can be seen that as C_L rises slightly and C_D falls with

By **T. A. BROWN**

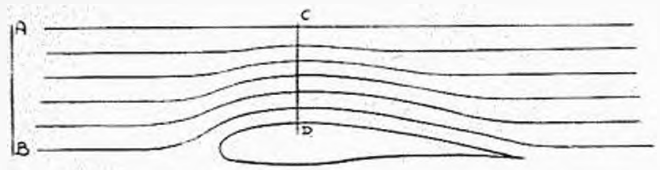


FIG 1.

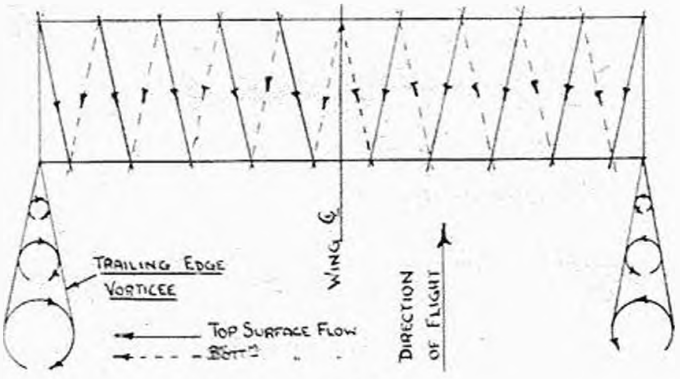


FIG 2.

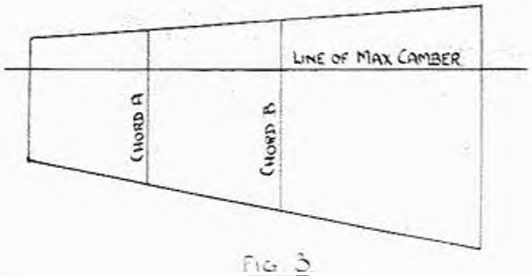


FIG 3

increased aspect ratio, L/D is increased. At small angles of incidence, and hence small values of C_L, C_D, do not vary a great deal with increase in aspect ratio, since C_{D_i} varies as C_L^2, this explains why with high-speed aircraft flying at low C_L values the aspect ratio can be small without a large reduction in performance, but for slow-speed aircraft it is essential that aspect ratio be kept as large as practicable, e.g. full-size high-performance sailplanes have been known with aspect ratio as high as 30

Summarising, we can say the following points show the effect of using a high aspect ratio:

(1) Lift coefficient increased slightly.
(2) Stalling angle occurs earlier.
(3) L/D is increased.

I would like to impress upon readers that the angle of incidence must be varied to suit aspect ratio. I read recently an article from a copy of *Zaic's Year Book*, in which a youthful enthusiast came to the conclusion that aspect ratio was a fetish, as he had carried out tests with one model with a number of wings of varying aspect ratio, and had found no gain in efficiency. The fact that he might have been using the most efficient aspect ratio already did not, apparently, register on his mind. Secondly, unless the angle of incidence is varied to suit the aspect ratio, there is no gain in efficiency, since the slight gain in C_L is offset by a gain in weight due to increased span, drag remaining almost the same, since the effective angle of attack is increased whilst all C_D values are reduced, so that actual C_D remains unchanged, since a large effective incidence is being used. I now trust that British aero-modellers will not be led astray by these false prophets.

There are, of course, practical limits to an increase of aspect ratio, and this depends to a large extent on the internal structure of the wing. The strength of the wing decreases with increased aspect ratio, or, shall we say, the load-carrying ability of the wing, since the thickness for a given airfoil section and area decreases with increase of aspect ratio, if the latter is achieved by tapering the plan form. If this is not so, however, a high aspect ratio means a large span, with resultant lift centres at a considerable distance from the fuselage, thus increasing the leverage or bending moment on the wing. A large span also means a longer fuselage or a greater tail area for directional stability, which means added weight.

The leverage question may be overcome to a certain extent by adopting a tapered wing plan form, when the centre of lift will not be so far out, since the area is concentrated mainly round the centre-section, despite a large span, whilst the airfoil thickness is greatest at the wing root as required. This tapered plan form, however, leads to further problems.

To find the most efficient aspect ratio is actually a matter of trial, wings of varying aspect ratio set at the correct angles for that aspect ratio and of the same airfoil section and type of construction should be tested in a wing turret, the most efficient aspect ratio being the one which gives a maximum figure for lift over weight.

A tapered plan form wing is more efficient in theory than a constant chord one of the same span and area, since the tip chord is less, and hence tip loss. This gives a higher C_L and L/D, but this depends a great deal on the shape in question, since the taper idea can be carried too far. Experiments have shown that the tip chord should be between one-half and one-quarter of the root chord for maximum efficiency, but certainly no lower than one-quarter. A good ratio would therefore seem to be $\frac{\text{tip chord}}{\text{root chord}} = \frac{1}{3}$, although there is some indication that the tip chord should not fall below $3\frac{1}{2}$ in.

I will now show why excessive taper reduces efficiency. We have seen that a tapered wing has a smaller tip chord, and hence less tip loss, than a rectangular wing of equal area and aspect ratio, and that airflow down the wing varies as tip loss, but there is another end flow due to taper which increases rapidly as the tip chord falls below one-quarter root chord. Suppose Fig. 3 is the plan form of a tapered wing, we can see that the maximum camber at chord A is less than the maximum camber at chord B, if the same airfoil is used throughout the span, and as the greatest pressure decrease on the top surface occurs at the maximum camber, there is a variation of pressure along the line of maximum camber, and hence on end-flow, which, in turn, produces larger trailing edge vortices and induced drag. This increase, however, is small in comparison to the decrease in tip loss by decreasing tip chord until we arrive at a tip chord of one-quarter root chord.

Tests have also shown that if a wing is tapered in plan form it is more efficient to keep the leading edge almost at right-angles to the fuselage centre-line and sweep the trailing edge back from the tip to give the required taper.

THE MYSTERIOUS MODEL

By ARTHUR MOUNTSTEPHENS

Job pulled a postcard from his pocket. He announced, with a sickly grin, that he had mistaken the date.

JOB WOOD, our Model Aeroplane Club's funny member, is rarely in a position to give anything away. So it was with considerable surprise that I received a note from him asking me to call at his house one Saturday late in spring. The note added that he had a special treat for me, all at his own expense.

Full of curiosity as to the nature of the promised treat, I went. It was one of those summer-like days of warbling birds, and the scent of new green grass lingered in the air. Job, curly hair ruffled, and with black grease on his nose and ears, greeted me at the bottom of the garden.

"I'm ready," he announced.

"What for?" I enquired.

"Oh!" said Job, remembering that he had not told me just why he had invited me. "A chap I know, who lives at Welmington, is trying out a new kind of petrol model aeroplane this afternoon. He's asked me over to see it, and I'm taking you."

Welmington is about ten miles from our town. It is one of those places with one bus per week, and that stops two miles from the village. Perhaps I looked disappointed, but Job, who was now stuffing his pipe with my tobacco, hastened to reassure me.

"It's all right," he said, "we're going on my motor-bike. I know a chap whose girl lodges where a chap who was a doctor. . . ." Job broke off.

"To cut a long story short," he said, "I've got some petrol."

Job's sunny face grew serious as I continued to look doubtful. "I've mended the two punctures," he continued, "and all that oily waste which I dropped into the petrol tank is practically all gone."

He wheeled out his motor-bike, a dilapidated nineteen-thirteen something or other. Job has forgotten the name himself.

"Amos!" he roared.

A plump lad, curly headed, with the biggest feet I've ever seen in a fourteen-year-old, darted from the house and knelt swiftly beside his father's motor-bike. Job's son seemed to know just what had been expected of him. Starting Job's bike was a two-man job.

The lad's job was easy, if unique. He simply held a handkerchief at the mouth of the intake pipe, while his other hand held the ignition lever, which simply refused to stay in the advance position unless so treated. Job kicked and kicked.

At last the engine started, and Amos sat backwards in Job's tulips, in mingled surprise and relief. I couldn't help noticing the look of pleasure on his face, despite his uncomfortable position, as the engine continued to roar. Undoubtedly Amos wanted to see us away. Perhaps he was looking forward to a pleasant afternoon in Job's workshop.

We were off to a good start, and the journey was half done before we made our first enforced stop. After that we made six stops, and each time Job disconnected the petrol pipe and removed foreign bodies.

During one of these stops I noticed a candle in the front lamp. "Battery's gone," Job announced cheerfully. And we had to return in the dark!

We got there at last, and I couldn't help feeling excited. Job's pal has a reputation of bringing out astounding things in the way of new model aeroplanes.

"He's in London," announced the good man's wife to an astonished Job. "And he won't be back until Monday."

Job pulled a postcard from his pocket. He announced, with a sickly grin, that he had mistaken the date.

"Never mind," he said as we made our way ruefully back to the motor-bike. "We'll go mushrooming."

"We won't," I said. "We'll get home straight away in the light. Besides, mushrooms of the sort that I eat don't grow at this time of the year."

And I kept Job on that motor-bike, despite his frequently mentioning a rest. Not until we were within two miles of home did I allow him to stop.

The sky was pink and blue. Early gnats zig-zagged from our pipes as we sat and talked on a moss-covered log. In front of us an ancient low wall fringed the flat moors. A row of crimson-tipped elms stretched away to our right.

"Sorry I couldn't show you any flying," Job was saying, when suddenly a model aeroplane, flying steadily, appeared from behind the elms. It faltered for a moment against the pink sky, then, turning towards us, dipped, and made a perfect three-point landing in the road. The unspent rubber motor continued to whirr the propeller.

"Well, I'm blowed," said Job, and went over to it. He picked it up and walked towards the wall, where he stood scanning the moors for a few seconds. He came back then and handed me the aeroplane. It was a

Lincol, a great favourite in our town. There was no special colouring, no N.G.A. registration, and no name and address; just an average new club member's effort.

"That's funny," said Job.

"What's funny?" I asked.

He looked puzzled. "There's nobody there," he replied.

I walked towards the wall and looked over. There is a clear view from this point for at least a square mile. One or two clumps of gorse a short distance away were all the covering to be seen. There *was* nobody in sight. And as people don't go launching models and then duck behind gorse, I walked back to Job feeling as puzzled as he had looked.

"That *is* funny," I agreed. "There *isn't* anybody there."

"And the motor was still running," said Job.

"Whoever launched it must have seen it come this way," I said. "We'll wait and see what happens."

"But where *can* he be?" Job kept asking, as we waited for fifteen minutes and nobody came.

At last we strolled over to the gorse bushes, but there was nobody behind them. The aeroplane had dropped from the blue. There was nobody who could have launched it.

True, the line of elms might have screened the model launcher, but who in his right senses would have disappeared mysteriously and left a practically new aeroplane to its fate?

"We'll take it home," said Job at last.

"And we could advertise," I replied.

"We won't," said Job firmly. "If the chap himself doesn't advertise, why should we spend the money? A chap who launches a model and then disappears deserves to lose it."

"The only thing we can do is to ask the chaps at the club meeting to-night," I said. "Perhaps they will know something about it." We had arrived at Job's house by now, and I offered him the model.

Job shook his head. "No, if that isn't claimed to-night, and it isn't advertised for, that model is going to be yours. Take it home. You've earned it this afternoon."

And as I carried the model home I felt that Job was right. I had earned it. For I was suffering from an affliction known only to those who have endured a motor-cycle ride seated on an iron carrier.

At the same time I felt sure that I should be handing the model to its owner that evening. The mystery of the missing owner must have *some* explanation. But though every one of our members was present at the meeting, the model was not claimed. Nobody had been flying a Lincol that afternoon.

Job bought a paper on the way home and scanned the late advertisements. There was no mention of the loss of the model.

"We'll look for the next few days," I said.

"But we won't advertise," responded Job. "No, not on principle. Careless blighters who fly 'planes like that deserve to lose 'em."

"But it was funny, though," I replied, "the chap disappearing like that."

"The bloke who owns that 'plane is probably daft," said Job. "He must be potty, not having his name and address on the model."

I could remember at least three 'planes that Job had lost through not taking that simple precaution. But I said nothing.

"He must have seen it come down, because the propeller hadn't fully unwound," Job continued. "He wasn't behind the gorse, so he must have scooted through the elms and gone down the road as soon as he launched it. Whoever he is, I should say he's potty."

And that was Job's final word as we parted for the night.

As I went into my house and received a message from my landlady, I couldn't help wondering whether Job would have still called the owner potty had Job been by my side.

"Somebody's been after the model aeroplane," announced my landlady, and I let him have it."

"Who?" I asked in surprise. For who could have known that I had it, seeing that I had not advertised.

"I don't know," she replied. "It was too dark to see in the black-out. But it was certainly his—he described it so well. He left a letter and said you would understand."

I took the note and opened it. I read:

"Dear Sir,

"I had to call when our dad had gone to the model aeroplane meeting. I tried his model after he went with you on the motor-bike. I'm glad you didn't look in the trees, because I hid there when I saw you. I think our dad forgot he had a Lincol, but I got it back because you never know. And please don't tell our dad because you know what he is.

"Yours faithfully, "AMOS WOOD."

Amos, the son of Job. Ah well!

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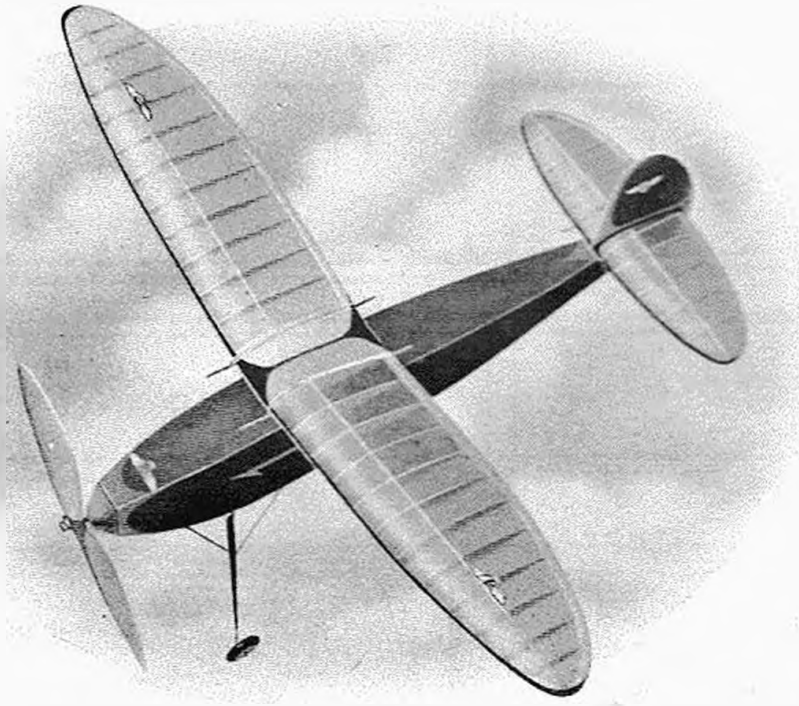
CLOUDCRAFT "COMMANDER"



The Cloudcraft Commander possesses beautiful lines and its appearance will satisfy the most discriminating model builder. Although a first-class competition model, it is not difficult to build, and should be within the capabilities of any constructor.

It conforms to full Wakefield specification, apart from its slightly lower weight. This can easily be brought up to the required figure, i.e. 8 oz., by the addition of a larger rubber motor.

The Commander features the Grant X-4 wing section, well known for its stable and slow flying qualities, and consequently has a very flat, slow glide, which will take full advantage of thermal currents.

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The wing span is 38 in., and area 279 sq. in.
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Overall length 33 in.
Weight, 6½ oz.

The kit is complete in every respect, and contains everything required to build this grand model, with no allowance for wastage.

The kit contents are as follow: Eight sheets of clearly printed balsa wood, with every part numbered to eliminate all guesswork. Ample strip balsa wood. Large tin of shrinking dope. Tin of coloured dope for decoration work. To give a super finish, a bottle of high gloss preparation is included. Monster tube of cement. 30 yards of fresh rubber. Tube of rubber lubricant. Ample tissue covering. Tin of tissue paste. Brass tubing. Completely finished 15 in. dia. propeller. Finished propeller shaft. Comprehensive and easy-to-follow plan.

REMEMBER—EVERYTHING IS INCLUDED—EVEN VALVE TUBING FOR THE PROPELLER SHAFT

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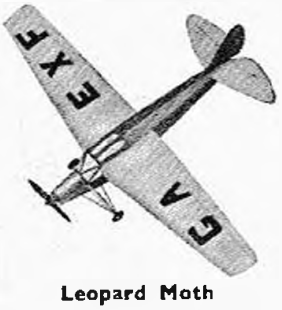

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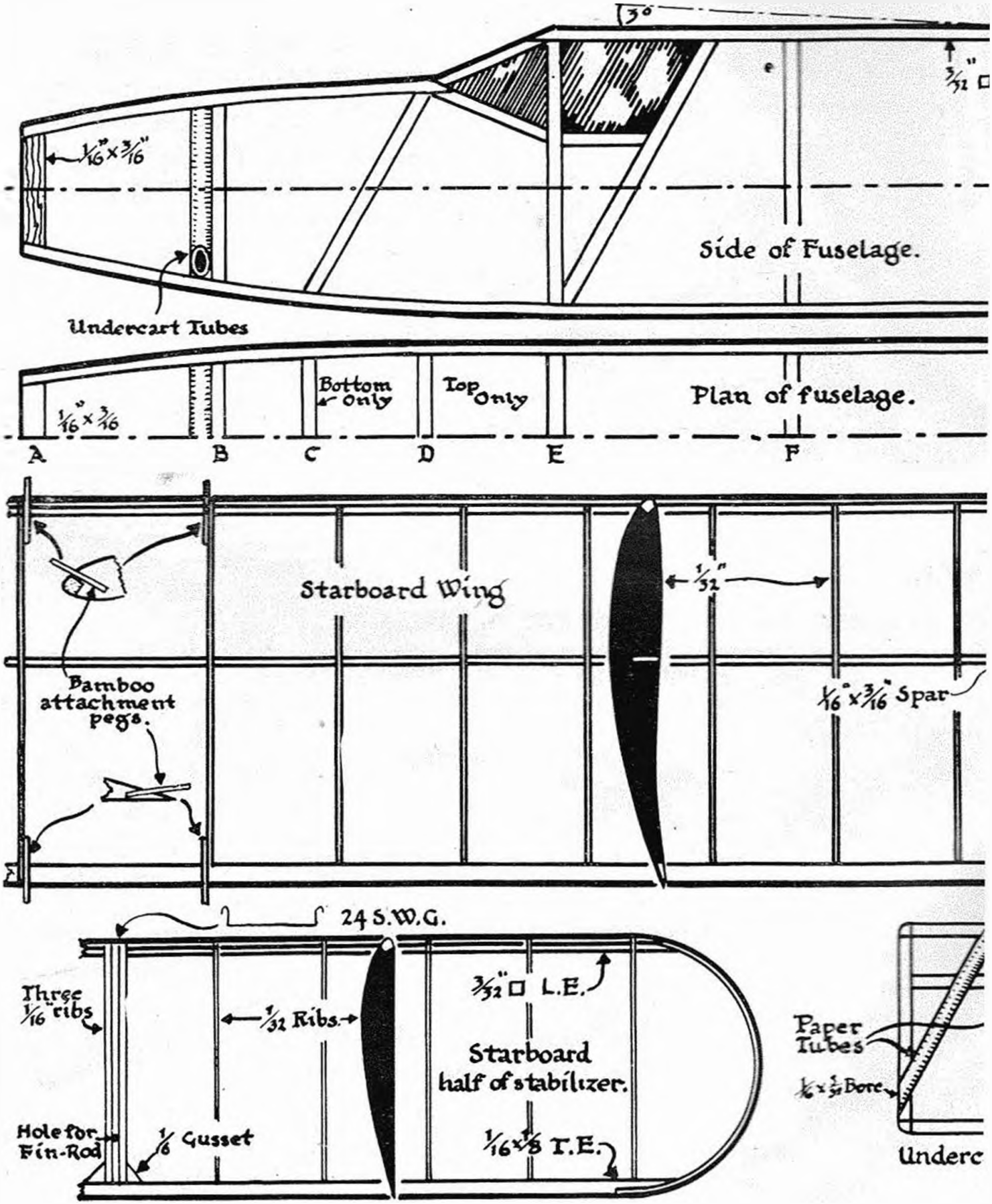
3°
3/32" □
1/16" x 3/16"
Side of Fuselage.
Undercart Tubes
Bottom Only
Top Only
1/16" x 3/16"
Plan of fuselage.
A
B
C
D
E
F
Starboard Wing
1/32"
Bamboo attachment pegs.
1/16" x 3/16" Spar
24 S.W.G.
Three 1/16" ribs
1/32 Ribs.
3/32" □ L.E.
Starboard half of stabilizer.
Hole for Fin-Rod
1/16 Gusset
1/16 x 1/8 T.E.
Paper Tubes
1/16 x 1/32 Bore
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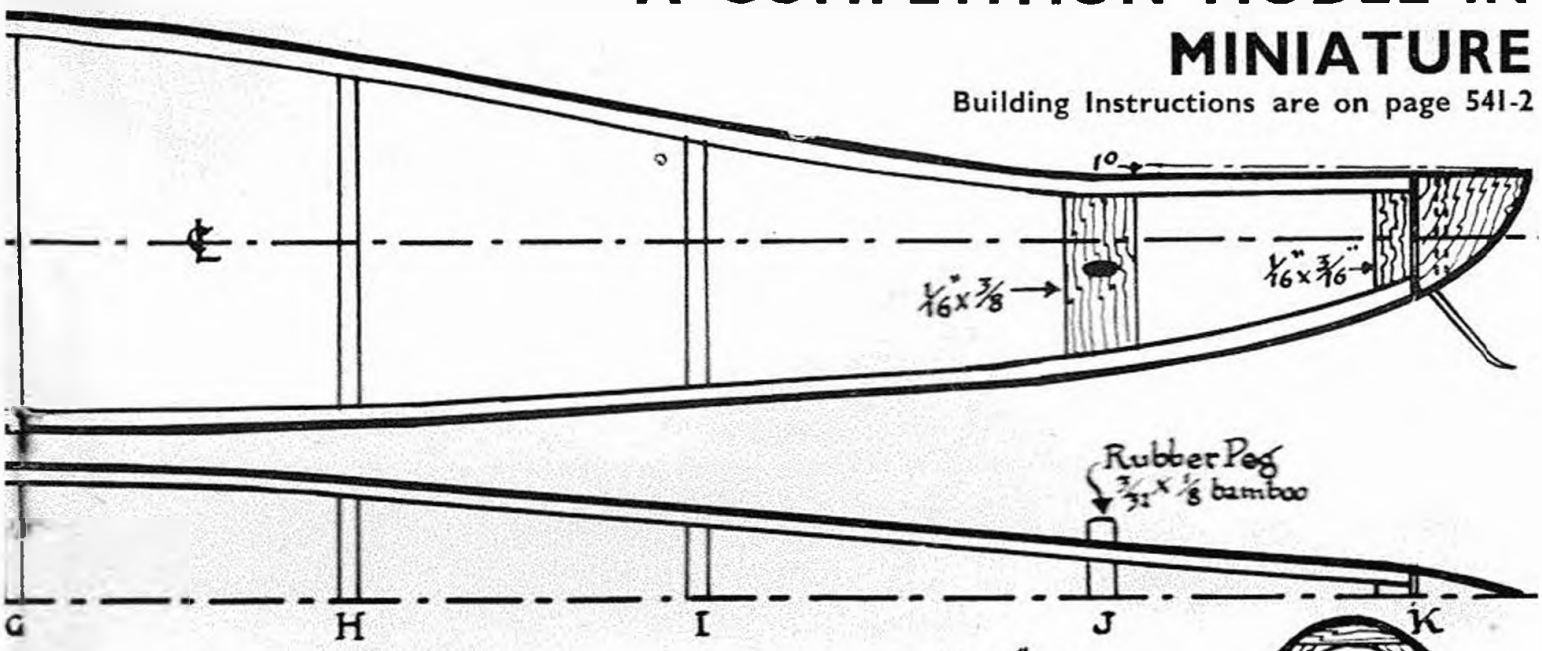
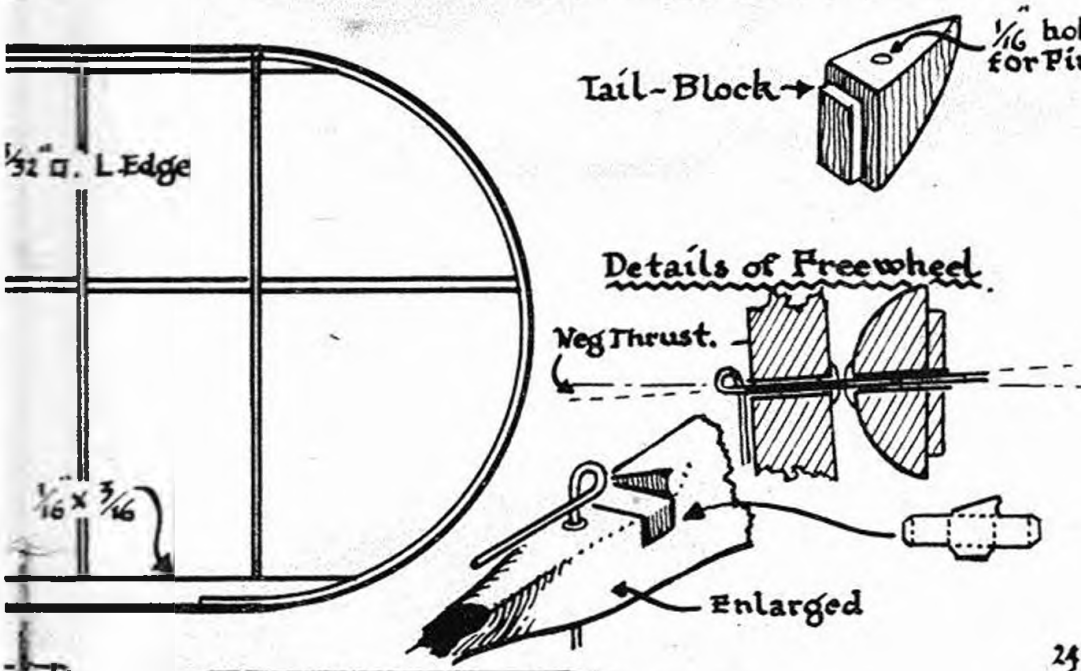
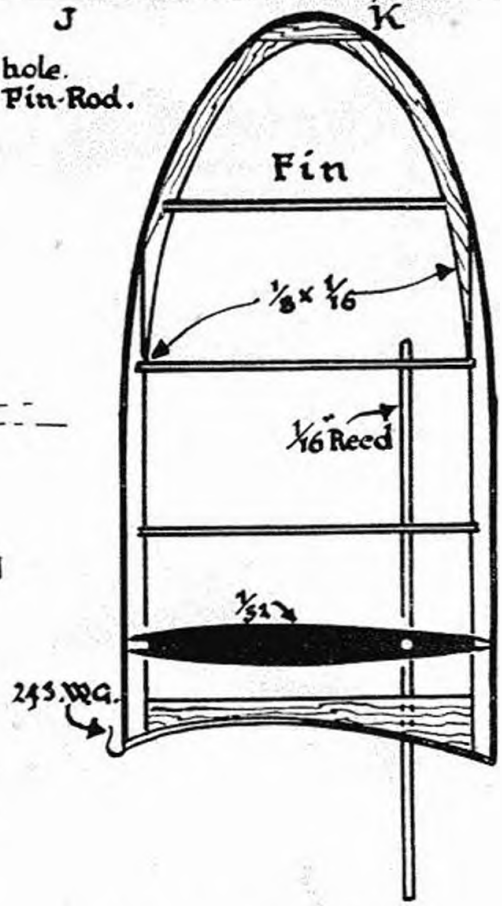
A COMPETITION MODEL IN MINIATURE

Building Instructions are on page 541-2







"WASP III"

Span 20" – Wing Area 58·07□"

Dihedral 1½"

Des by P. G. Chinn.

A COMPETITION MODEL IN MINIATURE

By PETER GARROD CHINN

This month our contributor has a break from his usual article on "Scale Design," and describes the construction of a small type of high-wing cabin monoplane. In our next issue we shall publish another article by Mr. Chinn in his series on Flying Scale Model Designs.

THE original "Wasp" was built about eighteen months ago; it was designed with a view toward obtaining maximum performance from a small model, and was therefore built on the lines of a large competition model. It is, in fact, more or less, a half-scale model of a typical lightweight contest machine.

The model presented here is an improvement on the original, and, although so far there has not been an opportunity of flying it under really good conditions, its performance should also be better. Non-thermal flying (which does not reflect the true capabilities of a model, anyway) showed the "Wasp" capable of clocking 90 to 100 seconds H.L. consistently on less than three-quarter turns, using six strands of $\frac{1}{4}$ in. by 1-30 in. rubber. On eight strands the model has a real rocket-like climb, and will shoot up in a tight spiral, but becomes rather sensitive to adjustment. The beginner would be wise in using four strands until he has become used to delicate trimming. Regular durations of more than a minute are easily obtained on this amount of rubber.

The "Wasp" incorporates the "lifting-tail" principal, now adopted almost universally by designers of competition models, but seldom used on small jobs. No difficulty in adjusting was experienced through this arrangement. Construction is, of course, almost entirely of balsa, and is quite straightforward. However, it is as well to remember that in building a model of this size the margin of error must be very small. A slight mistake, which would have little effect on a big machine, will be magnified many times in a model such as this.

Now, will all those who, having read so far and studied the plans, think this model worthy of their labours, please step forward—dear me—only one—a beginner, too—oh well, here goes:—

Fuselage and Undercart.

First cover the drawing with waxed paper (to prevent the wood from sticking to it, Johnny, and you can get waxed paper from your corn-flakes packet). Now bind the top pair of longerons together with fine thread and gently bend them to shape whilst holding in a jet of steam. Do the same with the bottom pair, and then when quite dry (making sure that they are still in shape) take off the binding, and attach one top and one bottom longeron to the plan—pin each side of the strips, of course, not through the wood. By the way, do not think that because the longeron will bend to shape dry without cracking it is not necessary to steam them—it is! You will find your fuselage sides warped when removed from the board, unless the longerons are shaped first. Don't try soaking the wood and pinning it to the plan either—that, too, won't work!

Next, cement in the side members. Upright "J" is of $\frac{1}{16}$ in. medium balsa, and should be pierced to take the $\frac{1}{8}$ in. by $\frac{3}{32}$ in. bamboo rubber-peg. Build the second side on top of the first to ensure accuracy, then remove them from the plans and join with spacers at stations E, F and G.

Making sure that everything is square, the rest of the spacers may be cemented in. Members at "K" should be accurately cut to leave an opening $\frac{3}{16}$ in. wide at the rear end of the fuselage. Note that there is an extra spacer at "B" to serve as a reinforcement for the undercart tubes.

Good quality Tonkin bamboo should be used for the undercarriage struts. They are $5\frac{1}{4}$ in. long. For a distance of $1\frac{1}{2}$ in. from the top each strut is $\frac{3}{32}$ in. by $\frac{1}{16}$ in. thick, then tapers to $\frac{1}{16}$ in. by $\frac{1}{16}$ in. at the bottom. One-inch diameter balsa or paulownia streamlined wheels run on 22 s.w.g. steel wire axles, which are bound in the usual way to the end of each strut. A piece of glass may be used to taper the bamboo and to round off the edges to a streamlined section. The sockets into which the legs plug are made from gummed paper rolled several thicknesses around the strut. The top of the strut should be waxed or soaped to prevent the paper from sticking, whilst rolling the tube. These two tubes (or they can be made in one, and bent in the centre) are then attached to the fuselage framework at "B"—and don't be stingy on the cement! The ends of the sockets may then be cut off flush with the side of the fuselage.

Wing.

The wing has an R.A.F. 32 section, and is just over 58 square inches in area. Closely spaced ribs enable the wing to keep a fairly constant section all along its span. Each panel (minus the centre-section) is built separately. The leading-edge is of $\frac{3}{32}$ in. square medium balsa, fitted into the ribs edgewise. The trailing-edge is of $\frac{1}{16}$ in. by $\frac{3}{16}$ in. medium balsa. Nine ribs are cut from $\frac{1}{32}$ in. medium sheet for each panel; they may be perforated for lightness. The centre-spar is of $\frac{1}{16}$ in. by $\frac{3}{16}$ in. medium-hard balsa, and is set about $\frac{1}{16}$ in. up into the ribs, so as to ensure a smooth covering job.

The wing-tips on the original model were double-elliptical, but since no aerodynamic advantage is to be afforded by this shape on a small model, they have been replaced by the more easily made semi-circular tips. The tips may be of either reed-cane or bamboo. If bamboo is used it need not be more than 1-20 in. thick, but reed should be at least $\frac{1}{16}$ in. in diameter. The beginner who is not used to bending bamboo by dry heat will probably do better with reed-cane. Reed-cane should first be straightened out (it is usually sold in coils) by soaking in water and hanging it up, with one end weighted, to dry. When quite straight, it should be soaked again, curved to the shape of the tip and pinned down. When dry, it may be cemented to the wing structure.

The two wing-panels, now completed, may be joined by the three centre-section pieces. The tips should be propped up to $1\frac{1}{2}$ in. above the horizontal to provide the necessary dihedral angle whilst the wings are joined. Four wing attachment pegs of 1-20 in. square bamboo are fitted in each corner of the centre-section.

Tail Unit.

The stabiliser is constructed in much the same way as the wing. However, the leading-edge spar should be of lighter stock than the leading-edge of the wing. Ribs may also be of lighter balsa, or may be perforated. The centre rib is cut from three laminations of fairly soft $\frac{1}{16}$ in. sheet balsa. A 24 s.w.g. attachment hook is bound to the leading edge. Note the $\frac{1}{16}$ in. diameter hole bored through the centre rib.

The rudder construction needs very little explanation. Six pieces of medium $\frac{1}{16}$ in. sheet form the outline and the four $\frac{3}{32}$ in. ribs are symmetrical in section. A $\frac{1}{16}$ in. diameter rod of reed-cane passes through the three lower ribs.

Nose-block, Tail-block, etc.

The nose-block is carved from a piece of medium balsa, 1 in. by 1 in. by $\frac{3}{4}$ in. A piece of $\frac{3}{32}$ in. sheet balsa cut to fit into the front of the fuselage is then firmly cemented on to the block. 20 s.w.g. bore duralumin tubing forms the bearing for the propeller shaft.

The tail-block is cut from soft light balsa, and is recessed to fit the rear fuselage opening. A $\frac{1}{16}$ in. diameter hole is bored right through the block to receive the fin-rod. The tail-skid is a piece of $\frac{1}{16}$ in. square bamboo, tapering to $\frac{1}{32}$ in. square, and is pushed into the tail-block for a distance of about $\frac{3}{4}$ in.

Airscrew and Free-wheel.

The propeller is a typical duration "wind-shovel." The full-size blank is shown in the drawing. It should be cut from an 8 in. by 1 in. by $\frac{3}{4}$ in. block of medium balsa. Carve in the usual way, thinning the blades out to about 3-64 in. at the tips. Carve the tips to an elliptical shape, using a paper template to make sure that they are identical. Drill the hub to take a 20 s.w.g. bore duralumin tube, then, after inserting a piece of 20 s.w.g. wire through the bearing, sandpaper away the thick spots until the propeller balances in any position.

The model has been successfully flown with three different propellers, one of which was a ready-made paulownia wood, and beginners who have had no experience in carving would be wise in first trying one of these propellers. When purchasing, specify a hand-carved balsa or paulownia, coarse-pitch (about $1\frac{1}{2}$ times the diameter), and broad-blade, as small-area, fine-pitch propellers are inefficient on a model of this type.

The propeller shaft is of 20 s.w.g. steel wire, and is turned through 270 degrees at the front end to engage the free-wheel catch and to form a winding-hook. The free-wheel catch is made from sheet aluminium or duralumin, about 1-50 in. thick. It is cemented to the airscrew hub with the "hook" part bent up, and the three "tabs" bent down and pressed into the wood. Use plenty of cement round the joint. The other end of the shaft is formed into a motor hook. Cover the hook with rubber tubing, or better still, use a bobbin.

Covering and Finishing.

The whole model is covered in good quality light-weight Jap tissue. Colour scheme to choice of course. The original model had a yellow fuselage and rudder, with red wings and tail-plane. The next model had its fuselage covered in alternate black and yellow panels, giving it a striped appearance (wasp, y'see!). Just what colour in which you finish your model makes no difference—unless you are superstitious. Personally, I always steer clear of green, since all my models covered green have ended up in little pieces.

Cellophane or very thin celluloid should be used for the cabin windows and wind-shield.

After covering, spray all parts with water. Pin wing and tail surfaces down whilst drying to prevent warping. When quite dry, apply a coat of banana-oil and pin wing and tail down again. Nose-block, tail-block and propeller may be given two or three coats of banana oil and the latter waxed and polished.

Assembling and Flying.

The wing is set at 3 degrees positive incidence to the centre-line of the fuselage, and a strip of balsa should therefore be glued on the underside of the centre-section to raise it to this angle. The wing is attached with two small rubber bands running round the fuselage and over the bamboo pegs.

A thin strip of balsa is cemented to the underside of the stabiliser to raise the leading-edge to an incidence angle of $\frac{1}{2}$—1 degree position to the C.L. The fin-rod is pushed through the hole in the stabiliser and then through the tail-block. After the rubber motor has been fitted, a rubber band is passed over the tail of the fuselage and over the protruding ends of the rubber motor peg. The tail-block, complete with stabiliser and rudder, is then plugged into the fuselage. One end of the rubber band previously fitted is brought up over the stabiliser hook to the fin hook, whilst the other end goes back over the tail-skid to the tip of the fin-rod. This part may sound rather involved, but actually is quite simple. The whole secret is in the one small rubber band, which holds five components together.

As already stated, the model may be powered with four, six, or eight strands of $\frac{1}{4}$ in. by 1-30 in. aerostrip, and the angle of the thrust-line depends on this. Three degrees of downthrust are shown in the drawing, and this about the maximum angle that should be necessary under full power.

It is best to start with four or six strands of rubber (about 20—24 inches long and "self-tensioned" to hang just clear of the fuselage floor when unwound; if the motor is allowed to remain taut between hooks when unwound, this will prevent the free-wheel from operating). About $\frac{1}{2}$ to 1 degree of right-thrust may be applied by inserting a strip of balsa between the fuselage and nose-block on the port side. This will make the model fly more or less straight. Make sure that the wing and tail incidence angles are correct and that everything is square, then try a few glides.

The model is fairly robust, and can be launched from shoulder-height quite safely: in fact, it is advisable to launch high, as the true glide cannot be observed in short hops. The wing position may be adjusted until a flat glide without stalling tendencies is obtained.

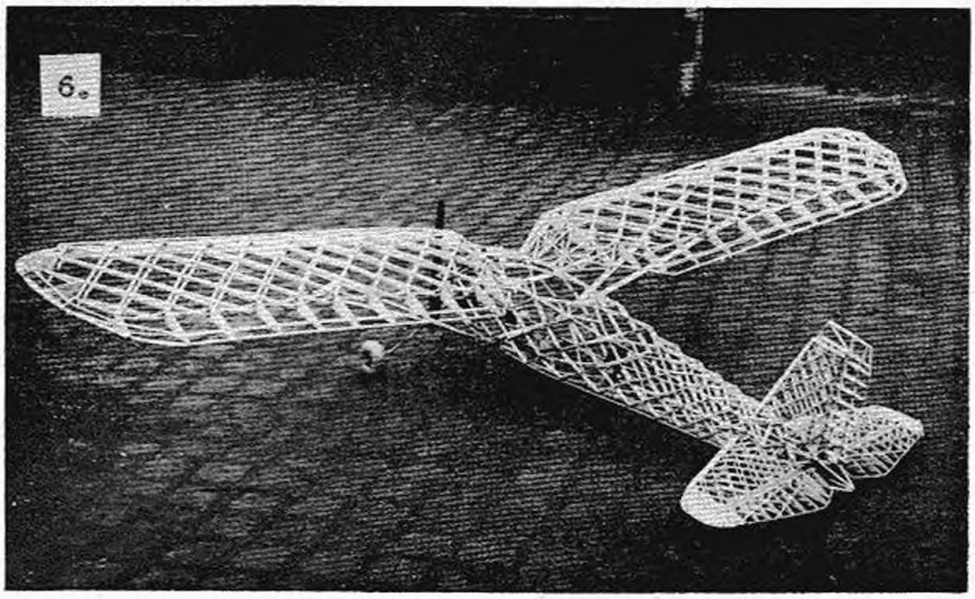
A power flight may then be tried with about 100 turns on the propeller. This is just a preliminary: no adjusting should be necessary at this stage. Increase the turns with each successive flight. When the model begins to stall upon launching apply downthrust to the propeller. Continue to increase the turns, and, if necessary, increase the angle of negative propeller thrust. Find the correct downthrust angle (excessive downthrust will prevent the model from climbing), then fix it permanently by cementing strips of balsa on the nose-block to give the necessary angle. The model should be made to circle to the right under power—use the rudder for this after having offset the propeller shaft to give straight flight.

Needless to say, all testing should be carried out on a still day. This is no "fair weather" model, however. The original was once flown in a breeze that carried it nearly half-a-mile in a three-minute flight.

PETROL TOPICS

By

DR. J. F. P. FORSTER



IN spite of the rapid sequence of dramatic changes in the war situation since "Topics" last appeared, my correspondence shows that there are still many active "hands," but "lone" and "clubite," whose ardour it takes more than war to damp.

Weather has been all that we could wish for in my parts, and while the long mowing grass has completely vetoed all land-'plane flying until haymaking a week ago, the sea, on the other hand, has been like a mirror, and much useful experiment with flying boats has been possible. Out of probably more than 100 flights, a great many of which have provided immense pleasure and satisfaction, the two most hair-raising incidents have been due, as usual, to the temptation (ever present on the wide open spaces of the sea) to indulge in too long flights. On the first occasion she was nearly shot down by Lewis-gun fire from an anchored mine-sweeper (or so the skipper told me) as she flew right through the rigging, underneath the wireless aerial, missing funnel and masts by literally inches!

The second mishap ended not so happily, though she has since been repaired and flown on many occasions as well as ever. This time it was a sultry, thundery evening, with odd puffs of wind, first in one direction and then in another. Suffice it to say that soon after taking-off on a 2½-minute flight a sudden in-shore breeze sprang up and she finally landed on *terra firma* (much *too* firm and stoney!). This resulted in considerable "disorganisation" of the hull bottom, which was well stoven-in in several places. However, she has recovered from what turned out to be a pretty severe abdominal operation. In passing I ought perhaps to mention that wings, tail unit and engine all remained intact. Still, it does rather tempt one to build an amphibian.

Apart from these aquatic activities, experiment has been carried on with P.8, which, as previously mentioned, incorporates slots built-in integral with the leading edge. Due credit for the decision to try slots must go to my friend, Lieut.-Col. C. E. Bowden. Not having seen his slots, I built mine to my own design, but in spite of this, and much to my amazement, they work and do everything he claims of them.

I think there is no doubt that this is one of the most important developments in petrol models since the advent of balsa, and I shall be very surprised if, after the war (said he, optimistically) we shall not see at all the big meetings at least 50 per cent of models thus equipped. It is unquestionably *the* answer to longitudinal stability, and, what is more, slots definitely have a very considerable influence on lateral stability by obviating the occasional dropping of a wing when nearing stalling speed. The result of this is that one can fly with perfect safety with only a minimum of dihedral, which is a very great point where scale modellers are concerned.

If the engine decides to "cut" in one of those very steep "pre-stalling" attitudes, there is no headlong dive before she takes up her gliding angle, but instead she just mushes gently into a glide. With my adjustable battery slide, it is interesting to send her off deliberately tail heavy. Instead of the usual fatal sequence of "zooms" and stalls, the resulting dives becoming successively deeper than the preceding "zoom," she maintains height at the end of the "zoom" by just levelling off, or at worst mushing very slightly.

A further rather important conclusion come to, where scale modellers are concerned, is that slots will enable us definitely to say good-bye to all these huge unsightly tail-planes, which heretofore have been the only safe way of avoiding occasional stalls by "getting that tail up" (usually only *just* in time) when the angle of attack became dangerously high.

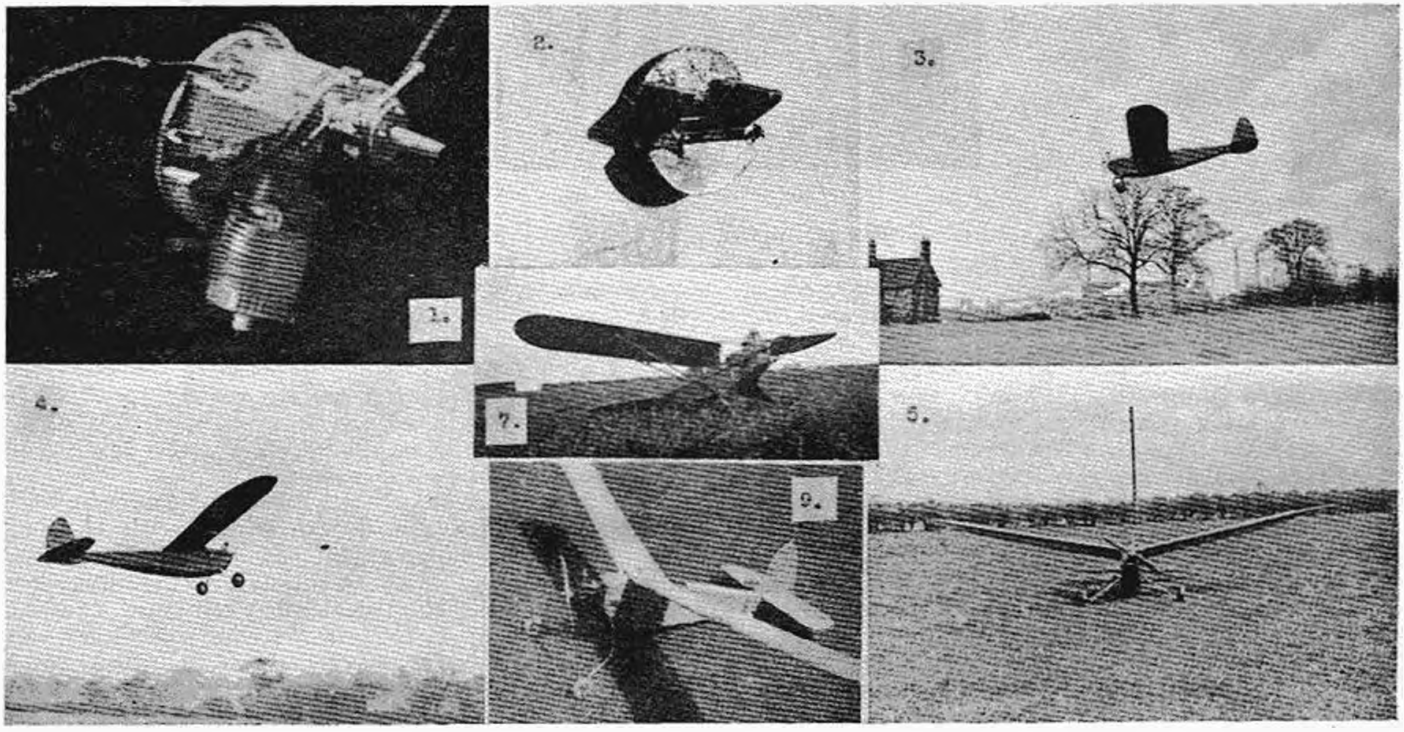
Since beginning these notes Col. Bowden has been home on leave and we have had ample opportunity of studying each other's slots in action. Apart from slight constructional differences they are very similar, except that mine become operative only at rather high angles of attack, and, after comparison with his, there is no doubt that his are still safer and more spectacular in their effects.

In June "Topics" note was made that W. C. Evans, of Horsham, was powering a 9 sq. ft. model of his own design with a Cloud 9 cc., for which he was full of praise. It is cheering of hear of good British engines (especially now that Americans are so difficult to obtain). The war and immediate post-war period, with the £ worth about a fair-sized 6d., should provide a great opportunity for British designers and distributors to get a much bigger

footing in the home market, and many correspondents express the hope that the pages of A.-M. may soon be enhanced by more well-illustrated advertisements of British engines than has been the case hitherto.

British engines have not enjoyed the reputation of their numerous American equivalents, probably largely owing to the inability of makers hitherto to make mass-production a paying proposition in this " un-petrol-minded " country. We must hope all this will be remedied after we have won this war, and I am evidently not alone in beginning to realise that the Britishers' reputation is not at all deserved. I recently flew old P.3 (just before she flew away) quite as well as with the best known American equivalent, with a Hallam Nipper (6 cc.), and Col. Bowden brought down one of the new Cloud Hurricanes (3·8 cc.), which we gave a pipe on both Ohlsson " 25 " and " Cloud " has no detrimental effect on their performance, and both the Hallam Nipper and its new big brother, " The Baby Nine " (8·5 cc.), which I am now running inverted on my flying boat, both have very short induction pipes distal to the needle valve.

On the other hand, the great advantage of this type of induction is that all of them employ *suction petrol feed*. I have seen, and myself experienced, more trouble with gravity feed than any other single cause, of engines suddenly stalling on a steep climb, only to pick up again in the ensuing dive. The 'plane then zooms again, and again the engine fades at the crucial moment. Finally (without slots), more height is lost in headlong dives than is gained on the " zooms," and often enough the 'plane finally hits the deck just when



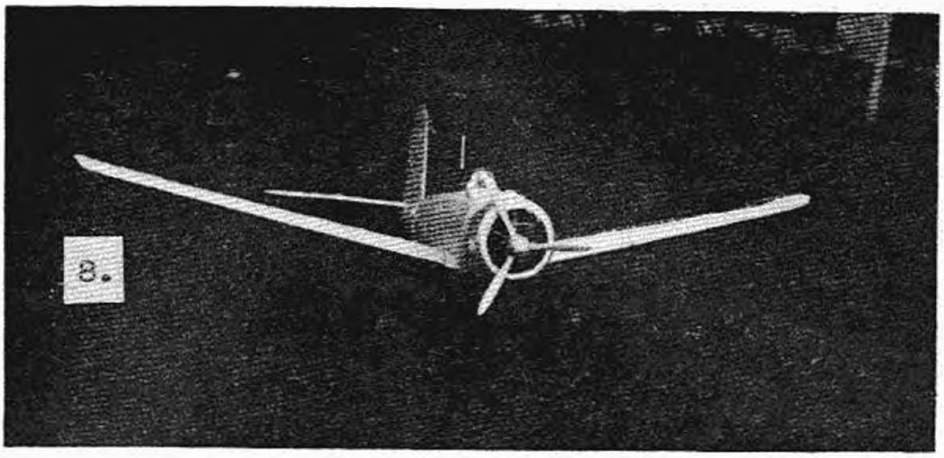
gruelling test, which included a 100 ft. dive, when the wings of my L.W. Freak folded up in mid-air! Some idea of this baby's power can be gained from the fact that it flies P.8 (which, as previously mentioned, was designed for a Cyclone) quite convincingly, the 'plane retaining quite a fair climb. The L.W. Freak and several of Bowden's smaller 'planes were simply " whisked " skywards, and in fact I rather think it was this " whisking " process which more or less tore the wings off the " Freak "! R. Edwards, of Burnham, has been having good service from yet another Britisher (Wasp 6 cc.), which is in fact the big brother of the well-known Spitfire. All this should be good news for " Petroleers," and here's hoping for news of more good British engines.

Several correspondents raise points regarding engine mounting and means of inverting engines. The prevalent tendency of engines to be designed with " direct induction port " as opposed to the rotary velve inlet, as on Cyclone and Spitfire, has the one great disadvantage of " overhang " to allow room for the tank suspended from (usually) inordinately long induction pipes. I say " inordinately " advisedly, as we have proved that cutting short the induction she is going fastest towards the bottom of one of these dives, with disastrous results.

Suction feed is the complete answer to this, and no matter what the 'plane's attitude, engines just keep revving steadily, or, if by accident the mixture does gradually become weaker, owing to launching too soon after starting up rich, any fading occurs progressively. If the 'plane *does* stall and dive, the engine will not suddenly pick up again on the dive, and the worst that may happen is that it will gradually lose height and give a very realistic demonstration of " rumbling in."

I have therefore converted my Cyclones to suction feed, and Photos 1 and 2 show my 1/3 circular tank (made from a boot polish tin of the same diameter as the standard Bowden detachable mount), slung under the bearer brackets, and also the complete unit, comprising inverted Cyclone tank and condenser. The latter lies across the top of the bearer arms behind the crankcase. The tank filler cap may be seen projecting outside the right bearer bracket viewed from the front. The engine will continue to run flat out if the 'plane is held in the hand with the tail hanging perpendicularly downwards. If held the other way up, with the tai

uppermost, after a time it may begin to four-stroke, owing to richening of the mixture; and since in flight, if ever a perpendicular dive should occur, I imagine we should all pray for the engine to cut, this, if anything, is an advantage.



And now for some of your letters. True to their word, that industrious pair, Ian Hannam and Lester Palin (*vide* last paragraph, June "Topics") send us excellent action photos of their latest efforts. Photos 3, 4 and 5 are of their 7 ft. span Utility model, powered by an upright Gwyn Aero. Wing loading works out at less than 8 oz. sq. ft., and power loading of well over 2 cc. per lb. The cantilever undercart, with no backward give, stands up quite comfortably to this light loading. Like several other readers, they miss the real point of backward sprung undercarts, which have been so insistently plugged by C. E. Bowden, D. A. Russell and other petroleers with longer experience than I have had myself. We all know, and have seen, cantilever undercarts which splay outwards, which perform perfectly well under ordinary flying conditions. Like most of Bowden's "safety devices," such as wings in two halves, detachable engine mounts and tail surfaces, they would all be unnecessary if we could guarantee a perfect landing on a perfect ground *every* time. They are not intended to deal with normal but *abnormal* conditions, and are more strictly clashed as "crash-proof" than "safety" devices. In a good landing it doesn't matter if the wing is all in one piece and even glued to the fuselage. The engine can be bolted into the fuselage as tight as you like, and the undercart can be built of cast-iron, or even balsa, if the glide is flat enough. The real test comes when something goes wrong, and she either hits the deck nose first, flies into a tree, hedge, house or other "unsuitable landing ground." An excellent example of the advantages of the backward sprung undercart occurred to old P.3 one day when she just failed to clear the top of a five-barred gate. The wheels caught the top bar fair and square, under full power. A horrible somersault resulted, landing upside down on the other side. There was no structural damage whatever. The undercart just gave backwards and sprang back into position. The detachable engine mount saved a broken propeller. The wings just lay flat on the ground upside down, the dihedral eliminated against the tension of elastic bands, and no long dowels broken, while the tail surfaces just lay a little askew, one or two elastic bands being broken.

The moral of all this is that all flying for the rest of that afternoon would almost certainly have been knocked on the head for anyone using a machine not incorporating *all four* of the above crash-proof features. Hannam and Palin object to backward-sprung undercarts on the grounds that in their experience they cause "nose-overs" on landing. This is quite true if the shock travel is not damped with sufficient spring or elastic. In ordinary flattish landings there should be no backward travel, and only *very* slight travel in a landing in rough grass, heather, etc. The backward "give" should only occur when the wheels meet some immovable obstacle, such as a plough furrow sideways on. Under ordinary circumstances the undercart works as "a splaying cantilever" type, just as used so successfully by them at present.

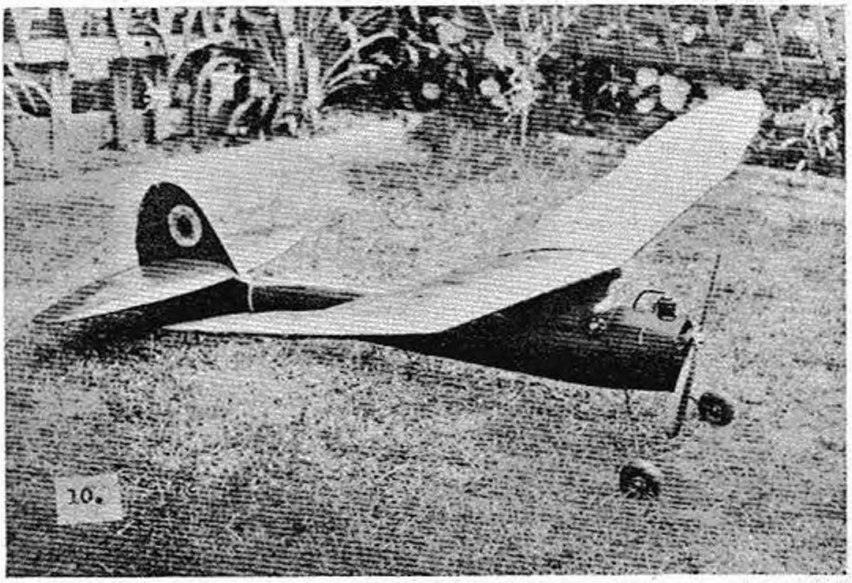
Brian Maxwell-Muller, of Bristol, sends some excellent photos, one of which is included this month (Photo 6), of a machine he has laboriously produced on the geodetic principle: a Howard D.G.A.8. Keeping to my original promise of honest criticism in this "Topics" feature, I can't help thinking it illogical to strut-brace a geodetic wing, which, if it lives up to its full-size counterpart, should theoretically be intrinsically stronger than any other type of equal weight. He will probably observe, "But it is a gull wing and more or less *must* be strut-braced." My answer is, "Well, why make a geodetic wing out of sheer cussedness?" Anyway, it has met the unhappy fate awaiting all "models of aeroplanes," which is a pity in view of the hours of patient labour involved in its construction. As a curiosity, however, it is of considerable interest to readers who like work for its own sake, and set less store by actual flying. Thank you for sending it, B.M-M., and for the small photo (unfortunately unsuitable for reproduction), which proves that it flew nicely at one time!

Another scale model enthusiast, M. T. Mitchell, of Colwyn Bay, sends me a snap of his very realistic 6 ft. span American Taylor Cub, powered with what looks to me like an upright Gwyn Aero (am I right?). How much prettier, and even more realistic, the 'plane would look if this were inverted. (Photo 7).

For real scale model work, take a look at Photo 8. This speaks for itself, and I hardly need to tell anyone that it is of a Blackburn Skua. Span 6 ft. 8 in.; power, upright Dennymite Airstream (9 cc.). The wings are supposed to be knock-off, located by birch dowels in paper tubes. Will its constructor, J. Ansell, of Bletchley, kindly send me details of wing fixing and undercart, and an account of how these stand the racket. The wing loading is somewhere around the pound mark. If there is trouble with either, try cutting out the centre section, mounting the undercart in the wing and joining the two wing halves beneath the fuselage with short dowels and elastic, *à la* "Baby Freak." Further tests (including that 100 ft. dive referred to above) are definitely proving that this solution of low wing undercart and wing fixing is sound, crash-proof and "can take it."

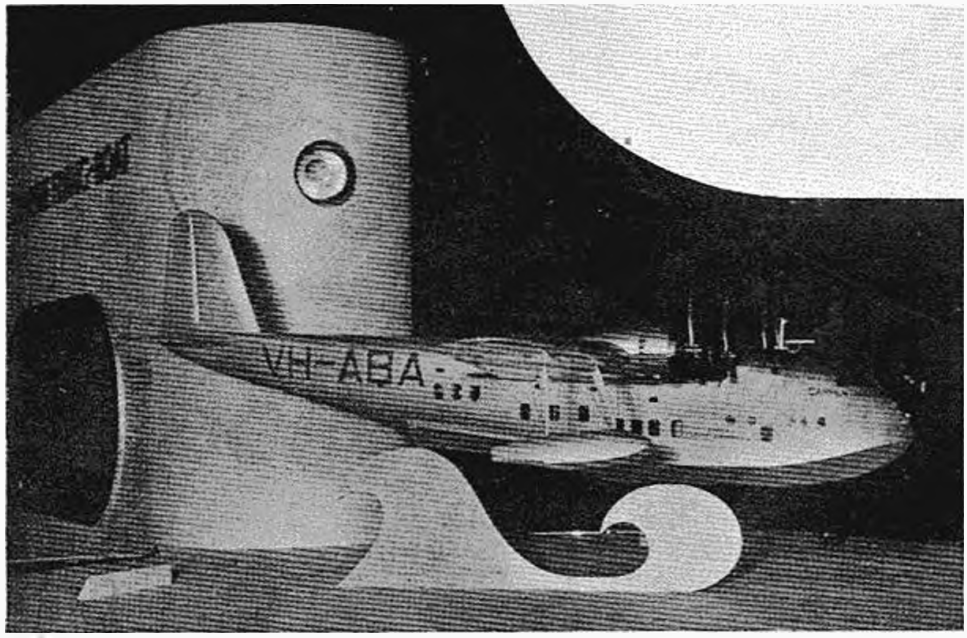
As a contrast with scale models, Photo 9 shows his version of the Bowden "Porlock Puffin," sent in by L. Ward, of Egginton, Derby. He has altered the undercart, covered the sides with $\frac{1}{32}$ in. balsa and powered it with an Ohlsson 23. Performance, as expected, is spectacular.

Owing to accidental shuffling of letters and their respective snaps in the offices of A.-M., I owe D. A. Pierpoint, of Burgess Hill, Sussex, an apology for attributing the best



snap of the month in the June issue, and submitted. I now think, by him, to H. C. Flello, of Gravesend. I also tripped up by calling it a recently published design of the American, Henry Struck. Actually it was one of the Megow range of kits, called a Commander, many photos of which have appeared in our contemporary, *Model Airplane News*. H. C. Flello writes me very modestly disowning it, and by way of rectification, apart from its own merits (which fully deserve it) I include a good photo now received from him of the model described in June "Topics" (Photo 10). Here we see his inability to get his engines to run well inverted translated into practice, for he mounts an upright engine in an inverted cowl! However, better this way than lowering the thrust line, and it certainly looks and sounds a lively job. It is actually Struck's recently designed "K.G." powered by an Ohlsson 23, the all-up weight being 28 oz., and if he has built the wing the same area as Struck advised in *M.A.N.*, his wing loading must work out at around 6·8 oz./sq. ft.! "Is this a record?"

Well, chaps, the disappearance of "Topics" for the last two months does not, as you see, indicate that I have suddenly hibernated in midsummer. The Editor tells me to blame Hitler for lack of space and not his long-suffering self. I can only trust that he wields his blue pencil a little less vigorously this month by way of compensation for two months' silence, as promised. The more material you send me the juster is our claim on the Editor's space, so please carry on.



HOW MODE
USED IN TH
INDUSTRY

These two photographs are of one of the Short Empire Flying Boats used by Qantas Empire Airways.

IT has been said that the greatest insult that can be offered to any aero-modeller is to describe his models as toys. Many of us have had occasion to go to great lengths to prove to laymen just how much science enters into the construction of a model aeroplane, be it a tiny indoor job or a large petrol-driven machine. Yet surely it is even now not generally realised how often models are used by those concerned with the aircraft industry.

From the time when the designer first conceives a new type of 'plane, to the day when it commences flying on some airline or protecting our country from invasion, the history of the aeroplane is associated almost continuously with models.

After a new design has been partially drawn out on the draughtsman's board the first models are made for use in a wind tunnel. Basic wind tunnel models often bear very little resemblance to the finished aircraft. They usually consist of a large piece of wood to represent the fuselage, another for the wing, and if the machine is to be twin-engined, two more pieces of wood to represent the power units. This model is polished to a very high gloss, so that when it is mounted in the wind tunnel the so-called "skin friction" set up by the air streaming past the model is reduced to a minimum.

From his experiments with this model the designer is able to decide for instance what airfoil to use for the wing. At a later stage in the design another wind tunnel model is made, but this is much more advanced, and is indeed practically a scale model of the prototype machine. It is made and used in exactly the same manner.

Even when his design has progressed so far, however, the prototype machine still cannot be built, for the next step is to make what is known as a "mock up." Although this is usually the same size as the finished machine is to be, it can in many ways be considered a model. Fretwood and cardboard are used to make a complete replica of the aeroplane, and if the machine is to be, say, a large four-engined landplane this may be quite an undertaking.

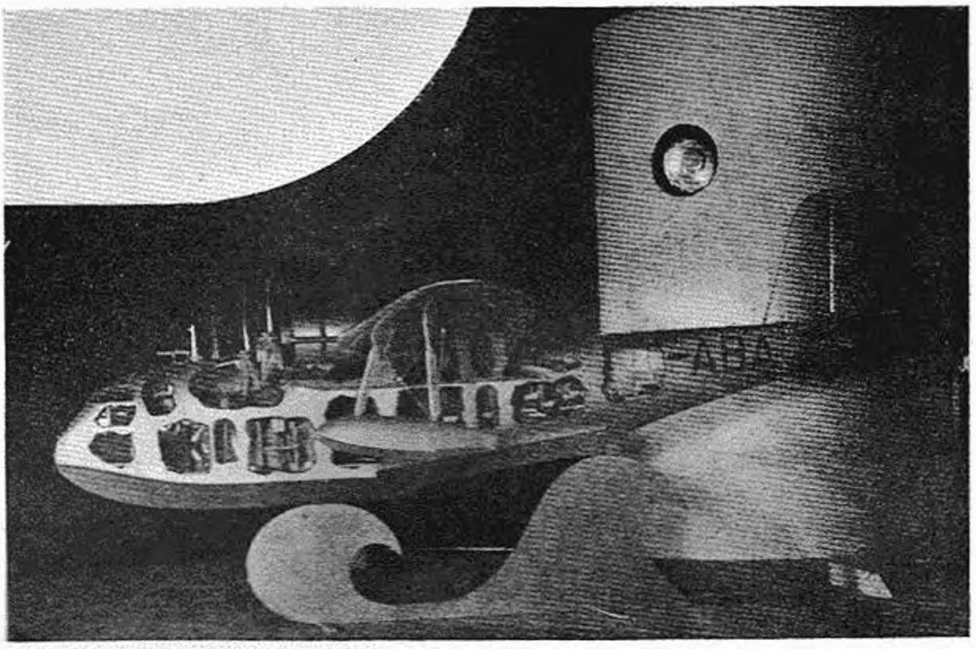
From the "mock up" the designer is able to solve such problems as which are the best places to fit the instruments in the cabin and, if the machine is a military one, which will be the most suitable positions for the guns. After the general lay-out has thus been obtained, construction of the first machine, or as it is called, the prototype, may be commenced.

Just like manufacturers of all other kinds of machinery, aircraft manufacturers have to publicise their products with a view to finding possible customers. As it is always desirable to interest prospective purchasers even before the prototype is finished, it has heretofore been the practice to engage an artist to make drawings for use as illustrations in catalogues and for distribution to the Press. During recent

No! This 'plane is not a real one, although the effect of the revolving airscrews is extremely well reproduced. Actually the photograph is of a model of a "Flamingo" built for exhibition purposes.

AIRCRAFT ARE AEROPLANE

By
HARRY McDOUGALL



years, however, it has become more usual to construct exact detail scale models and then photograph them in specially posed positions.

There are several firms who specialise in this type of work, and the models which they turn out are masterpieces of craftsmanship, for while they are often quite small they must incorporate even the tiniest details, or the photograph will not be realistic. As every aero-modeller knows, a properly constructed scale model, well photographed, is indistinguishable from a photograph of an actual machine, and the result is that through the skill of the aero-modelling craftsman and the photographer aircraft manufacturers are able to distribute what appear to be photographs of machines at a time when they are actually only in the "mock up" stage.

When the aircraft is finished and has passed its flight trials it might be thought that it would cease to have any connection with models. Yet even when it is winging its way on the airlines of the world much custom is brought to the airline operators by the detailed models in travel agencies' windows. It has long been the custom of shipping companies to use models of their ships in this manner, and the airlines have followed suit. One airline company recently ordered a batch of several hundred models of one particular machine to use in the shop windows of its agencies.

An interesting type of model used for this purpose is the "cutaway" variety where the side of the cabin is removed showing the disposition of the passengers' seats inside. Just how interesting these models can be is demonstrated by the fact that only a few months ago one of the main airline companies ran a special train of several coaches containing dozens of these models of all types and designs, this train calling and staying for a few days at all the major towns. Readers who had the good fortune to visit this exhibition will probably particularly remember an intriguing set of models showing the Mayo composite machines in different positions as they parted from each other. And all this in the name of publicity.

So we see how the model aeroplane can help its full-size brother during its design and construction and when in actual operation. Yet models are required even when it is desired to find the best means to destroy aircraft.

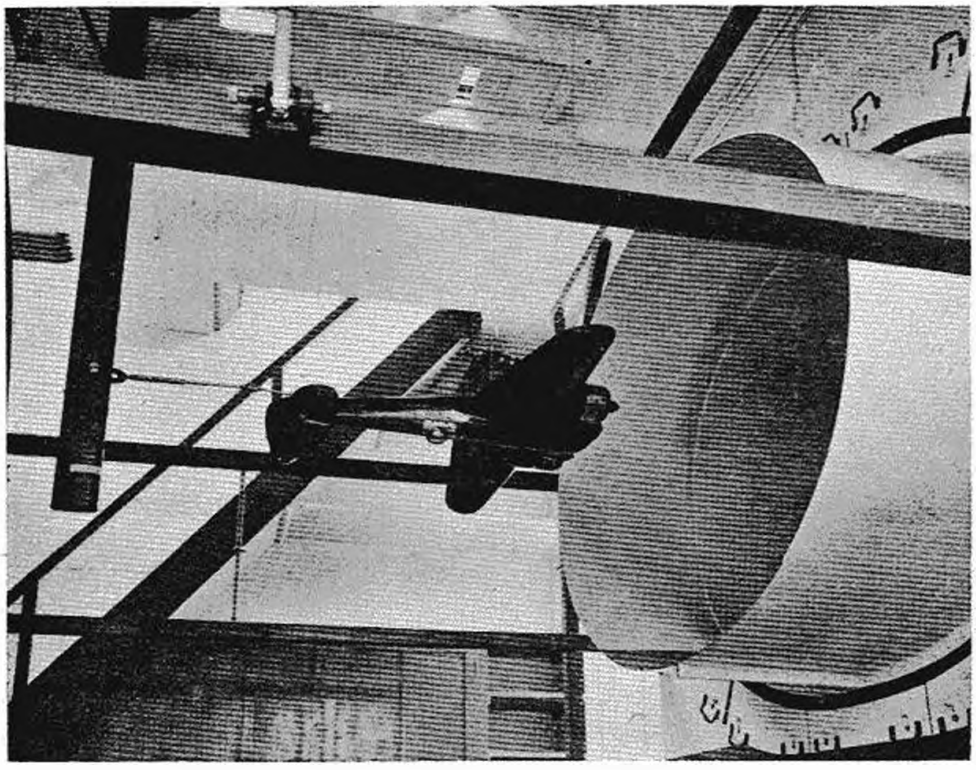
As every naval man knows, the simplest way to recognise a class of vessel is by its silhouette. For this reason it has for years been common to find in ships of the Royal Navy scores of charts showing the outlines of ships of various navies and also small miniatures of particular ships. In the R.A.F., where there are many machines which, seen from a distance bear a very close resemblance to enemy aircraft, it is imperative that every pilot and gunner should be able to distinguish friend from foe. This applies also to anti-aircraft gunners. Much to assist in this problem of recognition has been done by the distribution of silhouette charts of various types of aircraft, but here again the R.A.F. is taking a hint from the Navy, and models of the various types of Heinkels, Dorniers and so on are now employed.

One thing which an attacking fighter pilot must always know about his prospective prey is just where its "blind spots" are. These are positions from which a bomber can be attacked without the fighter being seen and without the defensive guns being brought to bear. This is difficult to show by means of charts, and the problem has been solved by using models. In this way our airmen are soon able to memorise the blind spots of enemy machines and later use such knowledge to good advantage.

When the air gunner is learning to fight off attacking aircraft a model once more comes to his aid. As it would be uneconomical to have machines continually cruising about the skies to form suitable targets for the gunners to train their weapons on, it has become a regular practice to use models mounted on the ends of long poles. These are waved about as if in flight, and looking along the sights of his Lewis the gunner has the illusion of seeing what is to all intents and purposes a target aeroplane hundreds of yards away.

In this country radio-controlled Queen Bee aircraft are used for target practice for A.A. guns, and each machine costs several thousands of pounds to replace after a direct hit. In the United States, strangely enough, such extravagance is looked upon with disfavour, and efforts have been made to construct petrol-engined radio-controlled models. This is, of course, a type of model which has been much experimented with individual aero-modellers, but the U.S. Air Forces, with their unlimited technical and financial backing, are much more likely to succeed than any private experimenter.

The type of model which has had the most success so far has a span of about 12 ft., and the radio with which

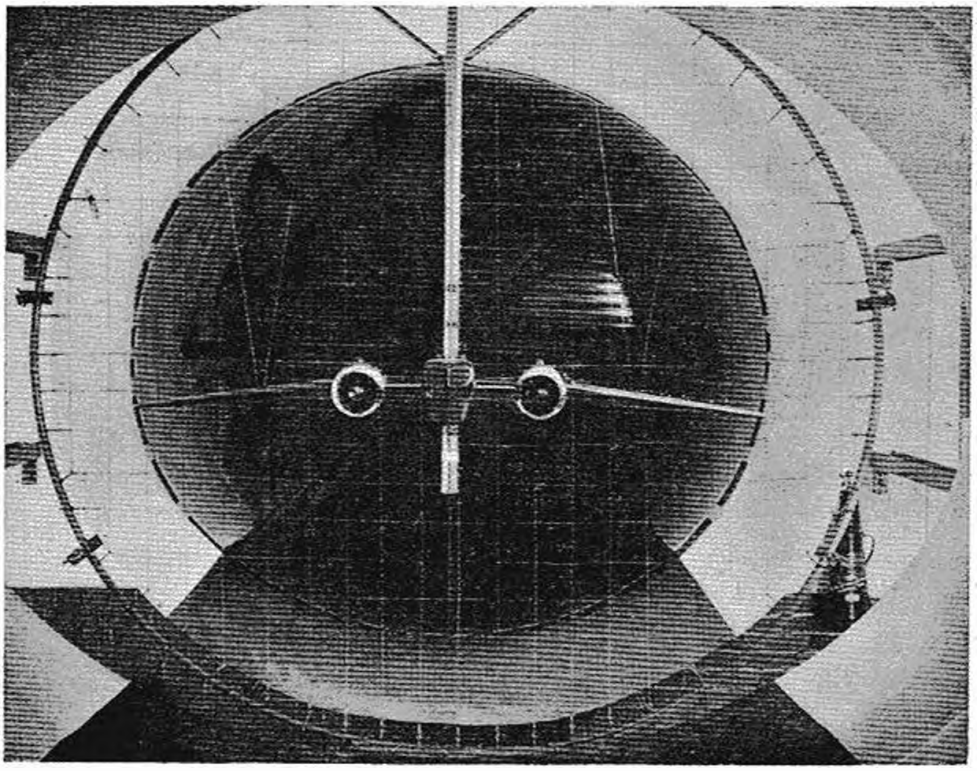


These two photographs have NOT *been printed upside down! Models are invariably suspended upside down when being tested in wind tunnels. The wires supporting the model are connected to one end of a balance arm, the other end of which is outside the tunnel, and to which are attached weights to balance the weight of the model. Now, if the model were suspended in its normal position it would tend to rise against the airstream, and thus the outer end of the balance arm would go down. In fact, for the 'plane to stay in the centre of the tunnel weights would have to be taken* OFF *the outer arm to equal the lift. By suspending the model in the inverted position (and, of course, adding weights to the other end of the balance arm), when the model is being tested the airflow tends to force it downwards, and so weights can now be* ADDED *to the other end of the balance arm to keep the model in the centre of the tunnel. The weights which are added are, of course, equal to the "lift" of the 'plane.*

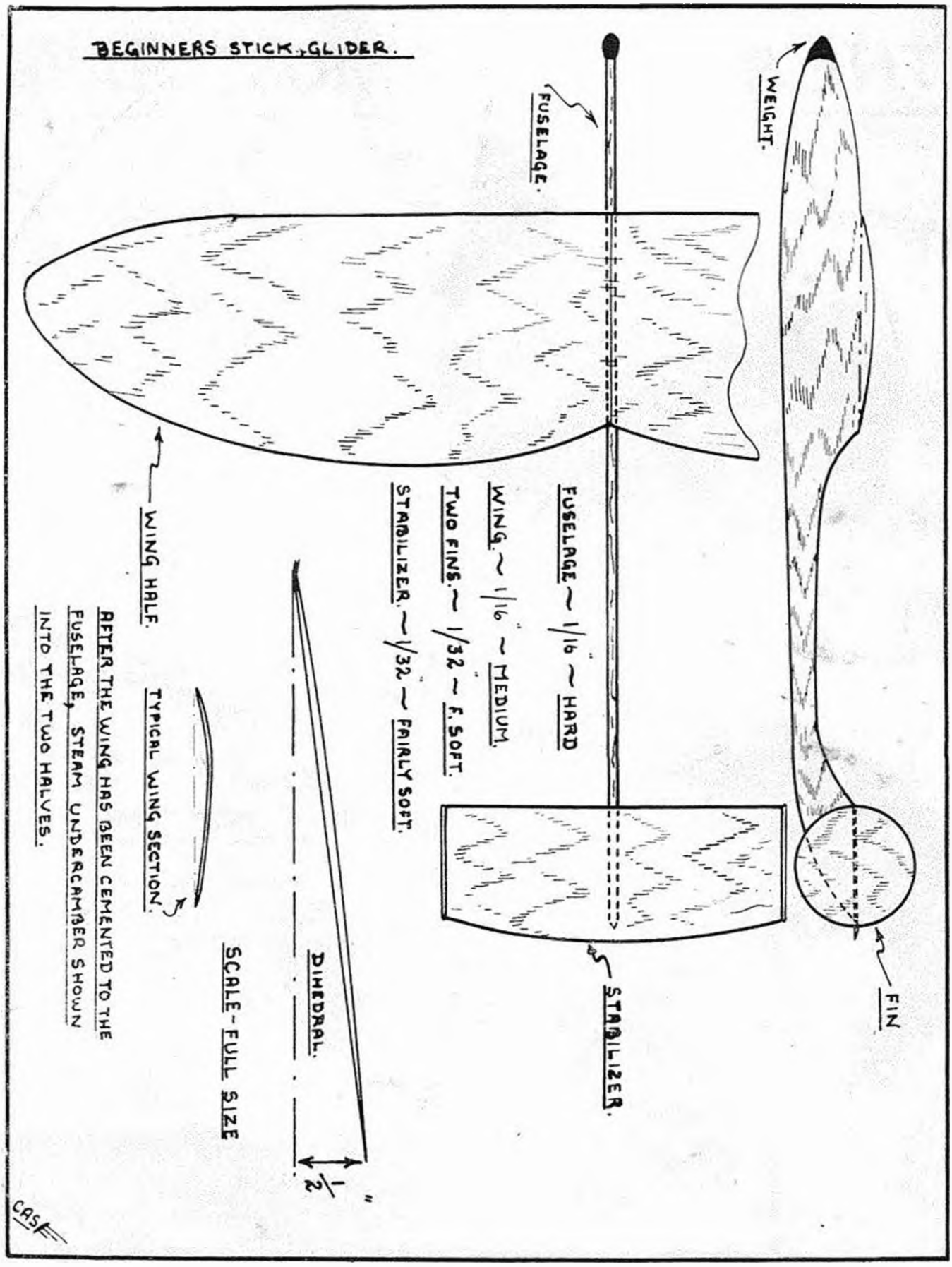
it is fitted is sufficiently sensitive to allow controlled R.O.G. flights.

Nevertheless, it is usually released from a catapult which fires it into the air at about its normal flying speed in much the same way as are our Queen Bees. The power is supplied by a much more powerful engine than the average gas job modeller uses, and this is made to drive two propellers in opposite directions, cancelling out any torque effect. As both these propellers are mounted in the nose of the model it has a rather odd appearance, but the models are, of course, intended for utility rather than good looks, and so this is of no great importance.

After making its flight a trapdoor is automatically released, and a large parachute billows out so that the model can descend safely to earth. Very little information as to the actual performance of these models has been given out, except that they have been successful, but from the fact that a parachute is necessary to land the model it would appear that the apparatus used is not entirely satisfactory. Perhaps the U.S. Air Forces would have more chance of success if they recruited a few gas job modellers.



Just in case any reader does not recognise the 'plane, it is the Bristol "Blenheim."


BEGINNERS STICK, GLIDER.
WEIGHT.
FUSELAGE.
FIN
STABILIZER.
FUSELAGE ~ 1/16" ~ HARD
WING ~ 1/16" ~ MEDIUM.
TWO FINS ~ 1/32" ~ F. SOFT.
STABILIZER ~ 1/32" ~ FAIRLY SOFT.
WING HALF.
TYPICAL WING SECTION.
DIHEDRAL.
1/2"
SCALE - FULL SIZE
AFTER THE WING HAS BEEN CEMENTED TO THE FUSELAGE, STEAM UNDERCAMBER SHOWN INTO THE TWO HALVES.
CASE

LETTERS TO THE EDITOR . . .

I am not quite sure what I shall be bringing down on myself, so it is rather fearfully that I, as a college student, question Captain Bowden's method of wing fixture, as in the August issue of THE AERO-MODELLER.

To quote Captain Bowden in that issue: "A balsa sheet-covered leading edge from front spar to the two main central spars. This forms a very strong hollow spar . . ." etc.

And yet, after all that, we see an attachment consisting of rubber, attached to hooks on the upper and/or lower surfaces of the centre section. While not denying the undoubted advantages of this idea I still say: "But I always thought that one put a spar in a wing in order to *take* loads."

Hence, naturally, any bending moment, due to lift, in the centre section should be transmitted by the spars and *not* by the ribs and the 3-ply skin.

Similarly (and here I evoke a more widespread blast) circular dowels for wing attachment should not rely on rib strength, when ribs should never have to take bending loads, but merely lift and drag. That is to say, each rib must help to stop wing deformation along the chord line, relying on its fixture to spars and covering in order to act as a drag brace. Hence, for those wings covered so that the dope does not actually stick the covering to the ribs, diagonal drag bracing is needed, more perhaps for unhappy impact loads than for actual flight loads.

Lest there be any misunderstanding, I direct my remarks solely toward petrol models, since these have a far smaller safety factor than rubber jobs.

I enclose a sketch showing a method of wing attachment which I know must be used by many others, but which I hope will call for the usual honest and interesting criticism that comes to many letter writers.

The sketch explains itself, and so I will go on to say that I use satin walnut for the wing pins. To demonstrate their efficacy after the manner of G-ADAR, my 7-foot petrol model of balsa construction struck a vicious eddy at about 50 feet and powered down-wind into the ground. The pins sheared off in almost a dead straight line, leaving the balsa boxes untouched.

So much for that.

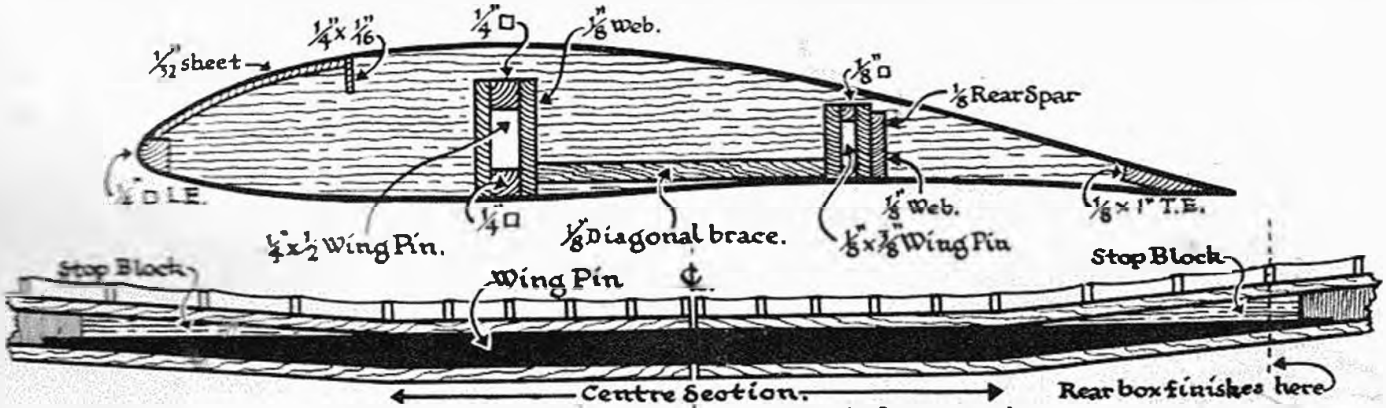
And finally, I should like to try and answer Dr. Forster's query about his sponsons. For no interference I believe the gap/chord ratio should be about four (4).

This is obviously not a practical proposition, but none the less, the Pan-American Clipper has thinner section sponsons than Dr. Forster, and yet experiences considerable interference. Naturally, the thicker the section the wider spread is the disturbance.

Also, with two planing steps, there must be considerable "stickiness," which might be partially eliminated by venting a couple of tubes from well above the water line to the vertical plane of the step.

I remain, hoping for some back answers.

Yours faithfully, A. G. PARRY.



Half size view of main spar with front web removed to show shape of the wing pin.

DEAR SIR,

We hope that Mr. G. W. Jones will not be too disappointed, but we are not going to have "engraved upon our brains" any part of his article on "Streamlining and its Bearing on Duration Models," which was published in the August AERO-MODELLER. In fact we have the temerity to doubt what he says.

Apparently Mr. Jones's theory is that if a model wing is set at a high angle of incidence it will generate sufficient lift to support the model at a slower forward speed, and thus the sinking speed will be less, despite the greater drag of the wing.

Well, then, let us take two streamlined Wakefield models, identical in every way, except that A has its 200 sq. in. wing at 3 deg. incidence, while the wing of B is at 6 deg. If the section is R.A.F.32, we get the following facts from the results by Powdrill and MacBean:—

Model	A	B
Angle of Incidence	3°	6°
C_l	0·84	0·96
C_d	·067	·086
L/D	12·5	11·1

Now, during the glide, the lift is equal to the weight of the model, in this case 8 oz., and if we assume that the L/D ratio of the whole model B is 8/1, the total drag is then 1 oz. Bearing these facts in mind we can calculate the following:—

Model.	A	B
Flying Speed (ft./sec.) ...	19	17·8
Drag of Wing (oz.)	0·64	0·72
Drag of Remainder of Model (oz.)	0·28	0·28
Total Drag (oz.)	0·92	1·00
L/D	8·7/1	8·7/1
Sinking Speed (ft./sec.) ...	2·17	2·21

Let us now examine the claims which Mr. Jones makes for a model with its wings at a high angle of incidence in the light of the above figures. These claims, you may remember were :—

(*a*) A very low forward speed.
(*b*) A high L/D ratio for the whole aircraft.
(*c*) An extremely low sinking speed.

But we find :—

(*a*) B's forward speed *is* less than A's, but by only about 6 per cent, which we feel is negligible.

(*b*) The L/D ratio of B is quite a lot *lower* than that of A.

(*c*) The sinking speed of B is actually slightly *higher* than that of A.

All of which goes to show that the way to take advantage of streamlining is not to keep the drag the same and increase the lift, but to keep the lift the same and decrease the drag. Funnily enough this is just what most aero-modellers have been doing.

We are,
Yours faithfully,
Glasgow M.A.C., Research Section,
J. H. MAXWELL.
(Interim Secretary).

DEAR SIR,

I should like to supplement Mr. Jones's excellent treatise on streamlining in the August issue of THE AERO-MODELLER by an experiment I recently carried out.

I was anxious to find out for myself the effect of reducing drag, so I fitted a typical streamlined shoulder wing "Wakefield" with a folding propeller an a mono-wheel undercart.

The gliding angle was considerably improved, being estimated at 16 to 1, or better, as compared with 12 to 1 with normal undercart and freewheeling propeller. The most interesting point, however, was that the forward speed *was considerably reduced*, yet the drag of propeller and undercart had been reduced.

This, in my estimation, conclusively bears out Mr. Jones's statements.

Yours faithfully,
D. HINCHCLIFFE.

THE SOCIETY OF MODEL AERONAUTICAL ENGINEERS

Notes on a Council meeting of the S.M.A.E. held at the Grafton Hotel, Tottenham Court Road, on Sunday, July 12th, 1940.

Mr. A. F. Houlberg was in the chair.

The Minutes of the previous Council meeting were read, confirmed and signed.

Mr. Cosh informed the Council that Sir Richard and Lady Wells had lost two sons in action. He had sent messages of sympathy on behalf of the Society. The Council expressed its deep regret and thanked Mr. Cosh for his action.

In a letter, the Southampton and District Club stated that one of their members was Canadian born, but had been a resident in England for ten years. The club wished to know whether he could enter the Gutteridge Trophy. The Council regretted that they could not, at this stage, modify the rule, which stated that the competitor must fly for the country of his birth, and that the competition was only open to England, Scotland, Wales and Northern Ireland.

The hon. secretary stated that he had been in touch with the authorities with regard to loaning them the S.M.A.E. range-finder. Flying-Officer Gutteridge suggested that full details of the range-finder, including the serial number and other marks, should be forwarded, in order that the range-finder could be put to the greatest possible use.

A letter was read from Messrs. Caton Ltd. regarding the barometer which they had given as a prize. It will be remembered that this barometer and a cash prize were won last year by a member of the R.A.F. stationed at Mildenhall. Neither the barometer or cash prize had been presented. The matter was left to be dealt with by Mr. Cosh and Mr. Smith.

A letter from the Model Aircraft Trade Association was read, calling attention to an advertisement claiming a British record. According to the S.M.A.E. Handbook, the flight in question did not constitute a British record. The Association asked for guidance on this point. At Mr. Smith's suggestion, the matter was left over until the Council had dealt with the record claims.

Mr. Smith drew the Council's attention to the fact that, at the request of the donor of the Women's Cup, every winner should receive a framed photograph of that trophy. Owing to the war the cup had not been presented, but the Council decided that a photograph should be presented to Mrs. Baines, last year's winner.

The Council next dealt with record claims, and passed the following:

J. O. Young (Biplane R.O.G.), 31 min. 5·125 sec.

H. C. Baines (P.1.P.1. Hand-launched), 47·6 sec.

R. H. Warring (Hand-launched, fuselage Wakefield type), 26 min. 45·6 sec.

The Council congratulated Mr. Warring on beating Mr. Paine's record that has stood for so many years.

A claim from Mr. R. Skinner for a R.O.G. record of 31 min. 31 sec. was not passed, as this did not beat the existing British record. This flight was made on June 2nd, and will be eligible for the Caton Trophy.

The Halstead (Essex) Baptist M.A.C., with 15 members, and the Pharos M.A.C., with 23 members, were affiliated. Mr. Cosh was asked to suggest that this latter club be named after the district (Hillingdon).

The Croydon, Gosport, Hackney and Igranic Clubs were reaffiliated.

The Aspinall Aeromodellers Club were requested to forward further details.

The West Sussex Club, having provided the necessary information requested at the last meeting of the Emergency Committee, were accepted as an affiliated club.

The Warwick M.A.C. and Leicester M.A.C. asked that their grounds should be sanctioned for flying petrol models. The Council examined these applications and sanctioned the use of these grounds, subject to the clubs concerned connecting up with the local authorities.

A suggestion from the North-Western Area that decentralised competition results should be received by the Competition Secretary by Thursday instead of Tuesday was discussed. It was finally decided that results must be in Mr. Smith's hands by first post *Wednesday* morning.

A further suggestion from the North-Western Area that expenses in running the area committees should be granted by the S.M.A.E. was considered. The Council felt that further concessions could not at the moment be granted, but they complimented the North-Western Area on their activities.

A request from the Northern Heights Club for permission to fly decentralised competitions after 7 p.m. was considered. Mr. Bell stated that several of their members were on war work and were working until quite late on Sundays. It was impossible for these members to get to the flying field by 7 p.m. The Council decided not to alter the 7 p.m. rule, but, provided prior arrangements were made with the officials organising the competition, those competitors on national service should be allowed to fly after 7 p.m. It was pointed out by the Council that as the evenings are gradually getting darker, this concession will be of no very great value.

The S.M.A.E. timekeepers' arm-bands were shown to the Council. Mr. Cosh stated that he already had some of these on hand and that the official order form would be in the next issue of the *S.M.A.E. Journal*. The price of the arm-bands will be 6d. each, plus postage.

Mr. Gordon mentioned that on the outbreak of the war the Ilford and District M.A.C., who were affiliated, had ceased operations. Some of the members of this club had got together and formed a new club under the title Ilford Aero-modellers. This latter club had approached Mr. Gordon with a view to taking over the assets of the Ilford and District Club. The Council regretted that they could not assist the Ilford Aero-modellers Club.

The Council then discussed a suggestion that the S.M.A.E. should become trustees for any club that might cease operations until after the war. This matter was left in the hands of the Emergency Committee, who will, in all probability, have legal advice on the matter.

Mr. C. S. Rushbrooke brought to the notice of the Council the recent ban on kite and balloon flying. He stated that he had had several enquiries as to whether this affected model aeroplanes. Mr. Cosh stated that no mention of model aeroplanes was made in the ban, but if any club members were requested to cease flying they should do so and immediately get in touch with the S.M.A.E., giving full details, as the S.M.A.E., having contact with the Air Ministry, are naturally in a better position to look after the interests of the aero-modellist. Mr. Cosh regretted that some individuals had already been in touch with the

Concluded on next page.

S.M.A.E. REPORT.—*Concluded from previous page.*

authorities, and this action might do the movement harm. The Council reiterated Mr. Cosh's views that clubs in no circumstances should refute the authority of those requesting the owners of model aircraft to cease flying.

Mr. Hill, of Croydon, stated that his club, by arrangement with the police, inform their local authorities every time they fly. It was decided to give this matter prominence in the next issue of the *S.M.A.E. Journal*.

Mr. Briggs referred to the recent National competition as not proving the superiority of any club. Mr. J. C. Smith, the competition secretary, explained that when the rules of this competition were considered it was decided advisable to restrict duration flying, and this competition was evolved with this end in view, together with the idea of giving an inefficient flyer a better chance. The Council did not consider that another competition of this type would be run next year.

The Council then proceeded to fill the vacancy on the Emergency Committee. The following gentlemen were proposed—Messrs. Clarke, Hill, Wickens and Worden. A paper ballot was taken, and Mr. Wickens was elected.

The meeting closed at 6.30 p.m. with a vote of thanks to the chair.

H. YORK, *Hon. Press Sec.*

Brief Report on an Emergency Committee Meeting of the S.M.A.E., held at the Royal Aero Club, Piccadilly, on Sunday, August 4th, 1940.

Mr. Houlberg occupied the chair.

The minutes of the previous meeting were read and confirmed.

A hearty vote of thanks was accorded Commander Perrin for allowing the meeting to be held at the Royal Aero Club.

The Whitstable, Tankerton and District M.A.C. were affiliated, the Ashton and District M.A.C. were reaffiliated.

The committee then discussed the contemplated ban by the Air Ministry on the flying of certain types of models. A definite ruling had not been received from the Air Ministry, and the committee decided that when this was received, full publicity should be given to it, both in the national and technical Press. The committee also decided to publish this order in the journal and in the form of a card. This card should be of assistance to anyone should they be requested by local authoritiese to cease flying. Copies of the order will be obtainable from secretaries of all affiliated clubs and the S.M.A.E. When requesting copies of the order, please enclose return postage.

Since the meeting of the Emergency Committe, the Air Ministry's order has been received. This order definitely bans the flying of all types of petrol models, irrespective of wing span. It also prohibits the flying of all gliders and rubber-driven models having a wing span of 7 ft. or over.

The committee then dealt with a record claim received from Mr. R. F. L. Gosling for a tailless glider record, using a 100 ft. tow-line. The time was 1 min. 25·5 sec. This record was passed.

The Competition Secretary informed the committee that the result of the Gutteridge Trophy was unavoidably delayed owing to the following clubs not complying with the rules laid down relating to timekeepers: Nottingham, Bath, Blackheath, Southport; these clubs are being communicated with in order to straighten the position. According to the rules of the Gutteridge Trophy the winner is to hold the trophy for two months. The committee decided that the Trophy should be presented at the next Emergency Committee Meeting, which will be held on September 1st.

It was proposed that the S.M.A.E. should assist in organising a fund to purchase a Spitfire. Mr. Rushbrooke stated that an offer had been received from Mrs. McQueen to do the secretarial work this fund would involve. The committee will have great pleasure in doing all they can to assist in this fund and hope that the affiliated clubs will do their utmost to support it.

Mr. Cosh again brought to the notice of the committee that the timekeepers' arm bands are ready. The order form for these appeared in a recent issue of the S.M.A.E. journal.

The following two items were placed on the agenda for the next meeting of the Emergency Committee:—

1. The position of the S.M.A.E., should it decide to act as trustees to clubs that are temporarily ceasing operations.
2. To consider a decentralised indoor pole competition and other indoor activities.

The meeting closed at 6.30 p.m. with a vote of thanks to the chair.

H. YORK,
Hon. Press Secretary.

AERO-MODELLERS—PROTECT YOUR HOBBY

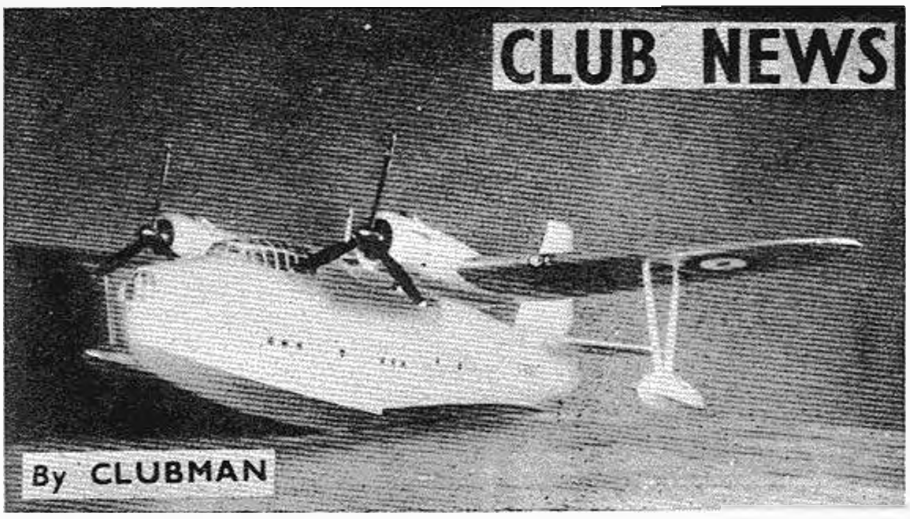
The Society of Model Aeronautical Engineers announces that, under an order issued by the Air Ministry, it is now an offence to fly the following types of models:

1. Petrol models of all classes and descriptions.
2. Rubber-driven models and gliders having a wing span of 7 ft. or over.

This order does not at present affect other types of models, but great care must be taken when flying to ensure that the hobby may be allowed to continue.

Issued in the intrests of the trade and the hobby by the Model Aircraft Trade Association. Secretary: C. J. Bradstreet, 92 Durham Road, East Finchley, London, N.2.

Window bills of the above are obtainable from the Secretary upon application and enclosure of 2½d. to cover postage, etc.



CIRCUMSTANCES still seem to be pretty difficult in most parts of the country, many clubs losing their grounds to "dig for victory" and other purposes. The most disturbing items I have to mention this month are the attempts in certain districts to curtail the flying of model aircraft. You will all have read of the Government ban on kite and balloon flying, and while I think any who carefully read the announcement will agree that there was no mention made in any shape or form of model aeroplanes, certain civic authorities seem to have developed either second sight or a power to read into written details something that is not there. All this is very unfortunate, but one thing does need stressing to the utmost, and that is that if you are told by the local authorities to stop flying models, do so *immediately* and refer the matter post haste to the secretary of the S.M.A.E., Mr. E. F. H. Cosh, 85 Maple Crescent, Sidcup, Kent. This is *most important*, as it is no good for individuals to argue the point with the authorities, which will inevitably lead to numerous complaints being sent by the said authorities to the Ministry, who will most likely just say "stop the lot" rather than be bothered.

The actual position is really quite clear, and is plainly stated in a notice issued by the S.M.A.E. on page 556 of this issue.

Personally I think the restrictions that have been imposed are very reasonable.

It is now up to all aero-modellers to abide by the Air Ministry Order, and don't let us have any cheating. One odd test flight of a petrol 'plane by an irresponsible aero-modeller—"I set the time switch for only 20 seconds, and I wanted only one test flight"—and the time switch doesn't properly operate . . . and away goes the good name of our hobby, and Lord knows what may be the consequences.

I see that the M.A.T.A. has had printed copies of the S.M.A.E. notice, and these may be obtained free on application to the secretary of the Association. This is a good idea, and club secretaries should get a few for display.

Until the Air Ministry Order has become known throughout the country it is possible that local authorities may still attempt to stop *all* flying. If this should happen, then, as stated above, those concerned should immediately cease the flying of their models and communicate with Mr. Cosh, giving the fullest particulars.

It is quite likely that the whole matter can be amicably cleared up at very short notice, but if individuals start jumping off the deep end and arguing with their local authorities it is only going to complicate matters.

However irksome restrictions are, if they allow us to carry on in some form or other, it is far better to be satisfied with small mercies, so remember, the whole movement depends on the individual behaviour of every enthusiast. To Morrison's slogan, "Go to it," I would add, "And do as you are asked." That is all for to-day, children—teacher has spoken.

Before carrying on with the reports I have got to rake up an old chestnut again this month as regards the date for receiving club reports. In spite of repeated notifications through these columns at various times, some clubs still persist in sending their reports *after* the 25th of the month. As far as I am concerned rules are made to be kept and not broken, and while in the past varying circumstances have been considered and individual reports allowed to drift in late, this has got to stop. You must realise that the preparing of a monthly paper of this nature means working to a very close schedule, and unless we have the full co-operation of Press Secretaries matters are highly complicated, so without mentioning any names (no names, no pack drill) I must ask you all to carefully note the foregoing remarks—the 25th of the month it is, not the 26th, 27th, 28th or 29th, and if you find it convenient to get your reports in a few days earlier than the requisite date so much the better. I am not going to say that early comers are going to get preferential treatment, but they certainly do wipe out the possibility of a delay in postage, causing elimination of their report.

Incidentally, what do you think of the following conversation I overheard a few days ago?:

First modeller (19 years of age, who has just passed medical as pilot for the R.A.F.): "Yes, I passed my examination O.K., but asked for deferred calling-up."

Second modeller: "But why?"

First modeller: "Oh! I have just finished a Wakefield model and must try it out well first."

Well, well, well, talk about finishing the game of bowls on Plymouth Hoe!

The winner of our heading photograph contest this month is again Mr. C. W. Harris, of Yeovil. This is a 33 in. span model of the "Lerwick" flying boat, and I think you will agree with me that this chap certainly knows how to build his models *and* how to photograph them. The detail work shown is exceptional, and I am sure you will join me in congratulating Harris on a really fine piece of craftsmanship. Now then, you model wallahs, what about some decent photographs? You all seem to have forgotten that the snap used as a heading piece each month brings 5s. to the lucky winner, so let us see some more really good photographs. I hate to keep harping on this particular subject, but ye gods, if you saw some of the photographs we get sent in it would make you wish you were Hitler—concentration camps would be about the only place for some of the blighters that feel so proud of their efforts. You might not always agree with my selection of photographs, but believe me, you only see the best.

In spite of pessimism in certain quarters, the S.M.A.E. events are being very well supported, and I am sure have done much to keep the clubs alive. Results of the Weston and Flight Cups are:

	Weston Cup.	Aggregate.
F. Hubbard (Halifax)		783·27 sec.

	Aggregate.
H. Simmons (Blackheath)	771 sec.
—. Barrett (Bedford)	728·8 ,,
N. Lees (Halifax)	667 ,,
J. O. Young (Harrow)	657 ,,
R. F. L. Gosling (Bradford)	561 ,,
D. Hinchcliffe (Batley)	554·8 ,,
G. A. Adcock (Bradford)	549 ,,
C. S. Wilkins (Bristol)	519·6 ,,
C. Smith (Bristol)	491 ,,

72 competed from 29 clubs.

FLIGHT CUP.

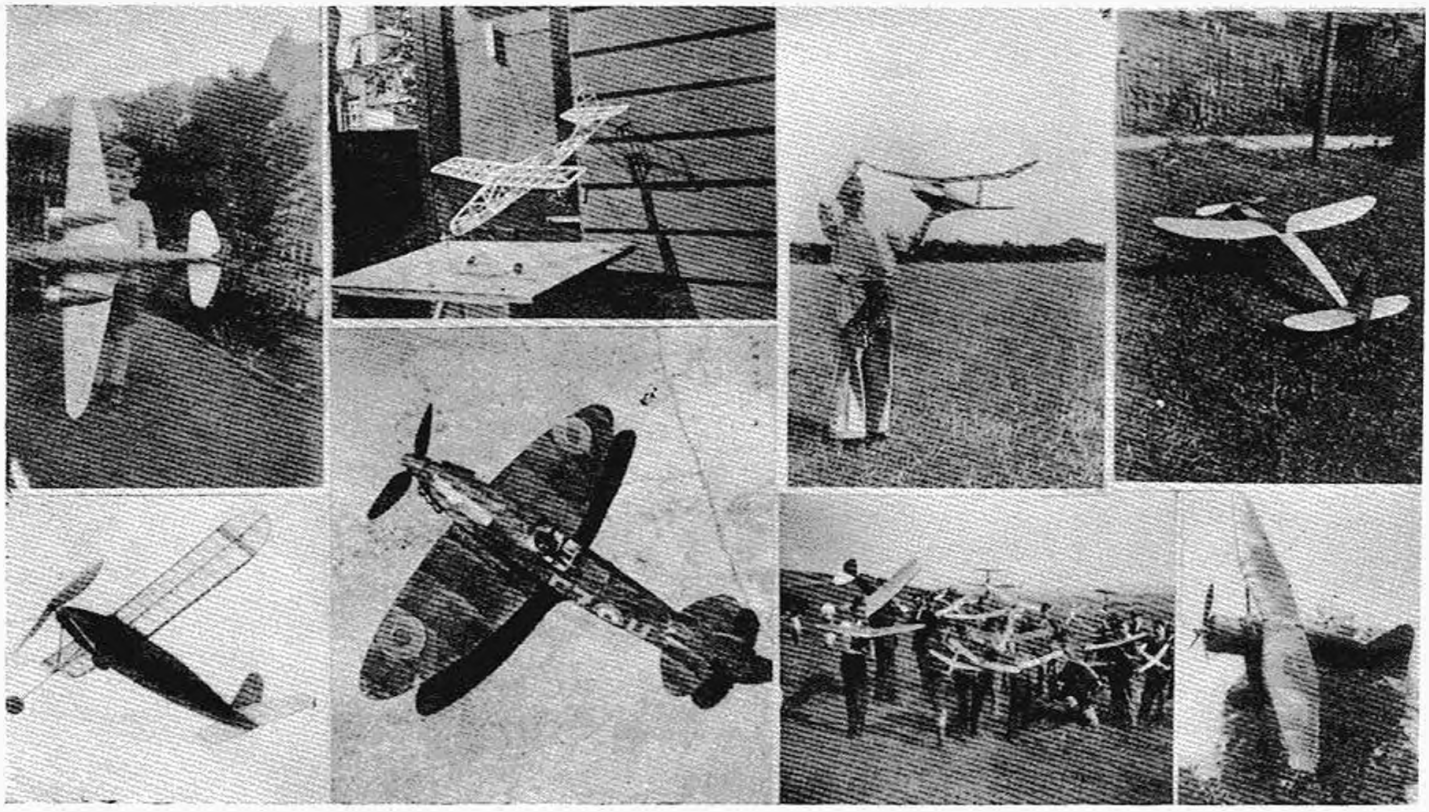
C. A. Rippon (Northern Heights)	1288·5 sec.
A. Ward (Brighton)	330·5 ,,
N. Lees (Halifax)	293·6 ,,
F. S. Thomson (Brighton)	292·5 ,,
A. Tindall (Lancashire)	292 ,,
L. C. Lucas (Brighton)	290·2 ,,
C. D. Jackson (Ashton)	280·2 ,,
W. W. Preston (Barnes)	273·6 ,,
R. T. Howse (Bristol)	242·7 ,,
C. R. Clarke (Northern Heights)	229 ,,

75 competed from 22 clubs.

Congratulations to Hubbard and "Rip" on their successes. The result of the Flight Cup rather tickled me, as "Rip" has been laying the law down about high duration flying and means of cutting it down, and here he goes and does a 16 min. plus flight—and that in the class he introduced in an effort to eliminate super duration flights. Ah me! At any rate, the results of the competition are a full answer to those who decried the introduction of the new formulæ event. I understand Halifax still lead in the Plugge Cup section, but have no official list to date for this event. At any rate, the honours are being very evenly distributed this year, which is "very tasty."

I note that our old friend Montgomery, of the FIFE M.A.C., is now doing his bit in the R.A.F., and you are asked to note that all future communications should be addressed to Mr. W. Murray, 27 Ava Street, Kirkcaldy. I am sure you will join me in wishing Montgomery best wishes and progress in his new undertaking. Mr. Murray won the Clyde Model Dockyard Competition with a single flight of 6 min. 17 sec., the 'plane being recovered from a potato field late in the evening. The R.O.G. fuselage record has been broken by Mr. D. Speedie with a time of 7 min. 22 sec. Mr. R. Montgomery made a fine flight of 7 min. 10 sec. H.L. with his Wakefield model. He followed the model for about 20 min., and it was finally returned to him after three weeks after the police had found it nesting about five miles away.

The onslaught by the local authorities has resulted in the CHEAM M.A.C. ground now being all lumps and bumps. Model chasing in consequence is now a hazardous business and is producing a new type of athlete (very fast "over the sticks"). The competition committee is seriously



Top (left to right). An "Airspeed Envoy," built from AERO-MODELLER *plans by Mr. W. Frost, of West Bridgeford. Another model built from recent plans, presented by* THE AERO-MODELLER. *The "Halcyon," constructed by Mr. J. E. Blackmore, of Exeter. Mr. Bob Russel, of Ipswich, with his "peg-leg," folding single-blader Wakefield model. A "Korda," by Mr. P. Makalow, of Dartford.*

Bottom (left to right). A "Northern Star," built by Mr. M. F. Boulestieux, of King's Lynn. Mr. R. E. Hogben, of River-in-Dover, is another to use THE AERO-MODELLER *plans, this time a "Spitfire." Members of the Portsmouth club. "Lysander," built by Mr. M. Walker, of Chester.*

contemplating entering one or two members in the next Grand National. Several members found their models ineligible for the "Weston Cup" event through lack of weight, a legacy of the light-weight craze.

Mr. S. A. Taylor, of the BUSHEY PARK M.F.C., has raised the club H.L. record to 10 min. 15 sec., the model eventually being found ten miles away (any more for a hike?). Mr. A. T. Taylor made a record flight of 5 min. 26 sec. with a glider, whilst on the same day Mr. A. H. Taylor (blimey, how many more of them?) raised the Farman Type pusher H.L. figure to 60 sec., the biplane R.O.G. to 317 sec., and K. S. Jeffery made a 24 sec. flight with a scale model. Incidentally, following my remarks on folding propellers in an earlier issue, it is as well to note that both Taylor's record-making machines were fitted with single-bladed folding propellers.

They say "the more you knock down the more they pop up," and this seems to hold out in the HALIFAX M.A.C. Mr. D. Peckett, who finished second in the "Gamage Cup" event, has joined the R.A.F., and now his place has been filled by Mr. F. Hubbard, who won the "Weston Cup." Incidentally, on the day of the competition, Hubbard was working until tea time, then made a hurried dash to the flying ground, and just got in his last flight of 10 min. at 6.45 p.m. It certainly appears that Halifax are well on the way to again collaring the "Plugge Cup" championship.

The good weather has seen some spectacular fly-aways with the lads of NEWCASTLE (Staffs) AND D.M.A.C., the best being by Mr. Cox's "Korda" on a trimming flight, this being timed (unfortunately not officially) for 10 min. before passing out of sight—for ever, worse luck. The chairman, Mr. Smythe, won the R.O.G. duration event with an average over three flights of 105 sec.

A list of club records has been sent in by the BATLEY AND D.M.A.C., and are as follows:

OPEN DURATION.

H.L. 10 min. 49·1 sec., by D. Hinchcliffe.

R.O.G. 5 min. 24·5 sec., by D. Hinchcliffe.

LOW WING.

H.L. 1 min. 2 sec., by G. Bedford.

BIPLANE.

H.L. 1 min. 8 sec., by D. R. H. Gardner.

SCALE MODELS.

H.L. 35·5 sec., by V. R. Dubery.

R.O.G. 34·5 sec., by D. Hinchcliffe.

SAILPLANE (100 ft. line).

45·5 sec., by R. F. Dubery.

WAKEFIELD R.O.G.

5 min. 24·5 sec., by D. Hinchcliffe.

Mr. A. H. Jenks, of the MERSEY M.F.C., won a recent competition with an average of 66 sec., this being the third consecutive competition he has won. Mr. J. H. Wilson was the runner-up with 64·2 sec., his machine going out of sight on every flight.

The Igranic chaps explain this month their enormous score in the "National Cup" event, mentioned last month. Their extremely high total was due to one "unfortunate" flight made by R. O. Harlow flying a modified "Korda," who clocked 720 sec. O.O.S. dead overhead. The model reappeared after some 20—21 min. and landed only about 600 yards away from the take-off spot. Blow me down, I can never seem to get this sort of flying at any time.

The R.O.G. club record of the WIRRAL M.A.S. has

been broken by Mr. B. V. Haisman with a Wakefield model of his own design which flew for 9 min. 50 sec. This chappy also won a recent glider competition, and I am notified that several super sailplanes are appearing in this club. This club informs us that a French aero-modeller, who is now in the Army in England, during a conversation told them that model-building is gaining ground in Tunis, and stated that they had one or two gas models.

SPECIAL NOTICE

"THE BEDFORDSHIRE MODEL AERO CHALLENGE CUP"—1940 CONTEST

Please note that the rearranged date for the above has been fixed for September 1st, 1940.

In view of the present difficulties, *re* travelling, etc., for the period of the war, this contest will be flown as a "Decentralised Contest" on each competing club's own ground.

Official results sheets will be forwarded during the week commencing August 26th.

The results of the "Everard Cup" competition staged by the LEICESTER M.A.C. are as follow:

	Aggregate.
1. A. Grant	449·5 sec.
2. C. S. Rushbrooke	371·5 ,,
3. F. Shaw	300·5 ,,

The glider event for the "Farmer Cup" held on the same day resulted:

BEST OF THREE FLIGHTS.

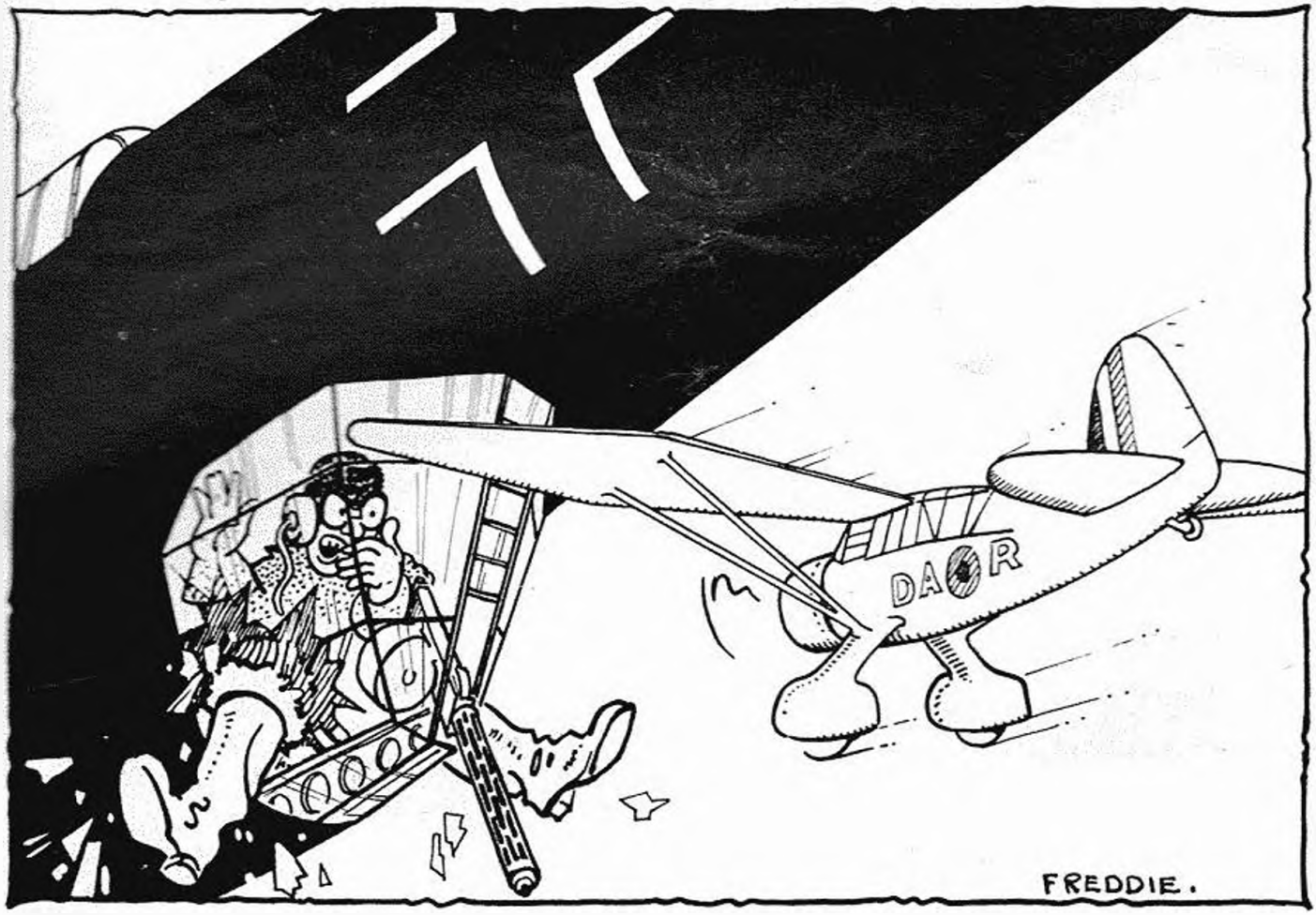
1. F. Davis	62 sec.
2. S. Seville	46 ,,
3. J. Klee	35·5 ,,

Club records in this section are now:

Open duration. D. Woodford ... ... 4 min. 48 sec.
Wakefield Class duration. W. A. Gamble 4 min. 10 sec.
Open glider duration. Mr. Davies ... 5 min. 32 sec.

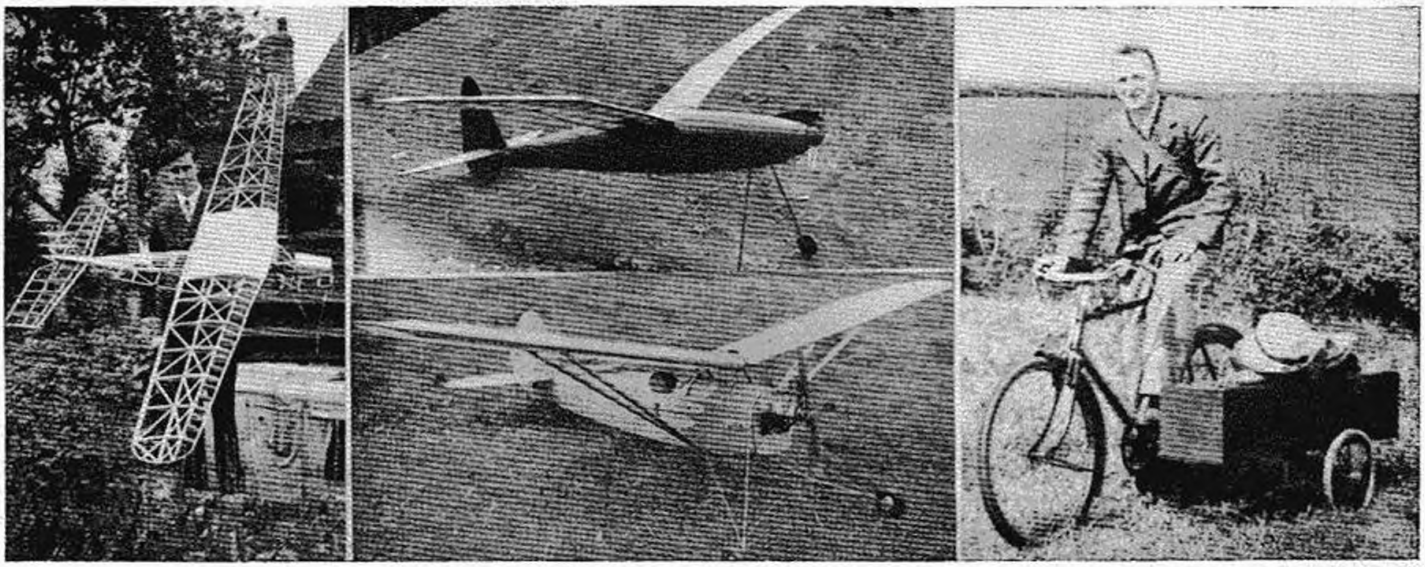
The lads of the IPSWICH M.A.C. found the best flying weather to be in the evenings. This certainly holds true as far as being able to take your model back home with you, for I am certain more models have been lost this year during the hot midday weather than ever before. On a recent Sunday in ideal flying weather everybody averaged over 1½ min., while Miss Joan Elbro surprised everybody by clocking 4½ min. O.O.S. with her model.

Mr. K. Slater, of the WESTLAND (ESSEX) M.A.C.,



HIMMEL! WERE BEING ATTACKED BY A "LYSANDER'S BABY"

(Now we know the real reason for the Air Ministry ban on the flying of petrol 'planes.—D.A.R.).



(Left) Mr. E. Grunwell, of the Halstead club, with a new petrol model.
(Centre top) A Wakefield machine that holds the club record of the Bushey Park M.F.C. Builder, Mr. S. A. Taylor.
(Centre bottom) Mr. Flamark's (Newcastle, Staffs) petrol model.
(Right) An ingenious means of overcoming the petrol shortage. Just one of the many cycle attachments seen on the roads to-day, the one shown being by Mr. Wilson, of Warwick

has won the " Young " Cup, which goes to the member with the best average spread over 45 flights, all flights taken at not more than three per week. No member flew the full required score, but Slater, by putting up a new club record of 4 min. 35·2 sec., scored himself to bring the cup to his cupboard this year.

Mr. Searle, of the THAMES VALLEY M.F.C., recently clocked a flight of 7 min. odd at turned 9 p.m. This will give you an idea of the sort of weather most people have been experiencing all over the country. Mr. Glaysher has clocked 5 min. 33 sec. with a flight cup model, and this chappy won a recent nomination event.

Our old friend, Mr. H. J. Towner, has successfully formed a new club known as the EASTBOURNE M.F.C. Actually one or two enthusiasts have been working for some years in this district ever since the days of Plater (of resergan fame). Naturally in this very restricted area, which nowadays comes under the defence limits, it is not too easy to conduct normal flying activities, but a good idea will be gained of the enthusiasm by the photograph, which is reproduced elsewhere in these columns. I reckon this is a jolly good " action " photograph, and technically is one of the best photographs we have had for some time. Application is being made to the S.M.A.E. for affiliation, and I am certain that with the leadership of chaps like Towner we should be hearing much more of this club. Persons interested in joining up with this club should get in touch with Mr. Towner, " Trencrom," King's Drive, Eastbourne.

The ILKLEY M.A.C. lads travelled to Leeds recently (mostly pushing bikes connected to home-made trailers, supporting sundry coffins). They were very successful, scoring first, second and fourth places, and Mr. J. Townsend spent quite a time looking for his model after a flight of 3 min. 19 sec. The final results were:

	Aggregate.
1. J. Townsend (Ilkley)	358·2 sec.
2. K. Anning (Ilkley)	324·4 ,,
3. R. Heppenstall (Leeds)	231·2 ,,
4. G. Bolton (Ilkley)	155·4 ,,

Anning won a club Wakefield contest with a total of 196 sec., while Townsend pulled off the flying scale event with a total time of three flights of 55·5 sec.

After making an encouraging start in the S.M.A.E. contest, being well placed in the " Gamage Cup," the CHINGFORD M.F.C. have had certain reverses, and owing to local conditions have been unable to compete since.

Members of the newly-formed Eastbourne club busily engaged preparing for a spot of flying. Mr. H. J. Towner, prime mover in this scheme, is seen on the right stooping over a model.

Club records have again been broken, but Mr. R. Gallop now holds the flying scale figure at 47 sec., while Mr. J. Holgate has pushed the R.O.G. figure up to 87 sec. Mr. Dupee won the "President's Cup" with a flight of 277 sec. O.O.S. Mr. A. Jardine won the heavy-weight H.L. contest with a time of 90·8 sec., while Mr. A. Neil bagged the light-weight event with an average of 46·6 sec.

Mr. Simmonds, of BLACKHEATH M.F.C., nearly snatched the "Weston Cup," being only 12 sec. behind Hubbard, of Halifax. He made one flight of over 8½ min., O.O.S. The Heath still possesses its thermals, and two all-balsa gliders were lost recently, one being unofficially timed for over 10 min.

Mr. Buxton, of the CROYDON AND D.M.A.C., has been doing his stuff lately and has lost two 'planes in the past three weeks; the first one did 5 min. 22·4 O.O.S., and the second went for good after 196·2 sec. He also did a flight of 2 min. 5 sec. with a microfilm job at an indoor meeting, the microfilm job weighing ⅜ oz. with 12 in. wing span.

The IRISH JUNIOR AVIATION CLUB regrets that due to present circumstances it has been decided to abandon Model Aviation Day, which was to have been held in the Phœnix Park, Dublin.

Mr. J. Moore, of the HINCKLEY M.A.C., won the under 16 years of age own design contest with a time of 2 min. 21 sec. These chaps certainly seem to get down to things well, and hold a competition practically every week-end. Mr. D. A. Debenham set up a new club record of 6 min. 41 sec. O.O.S., and the model was observed landing in a hedge nine miles away by a passing motorist 12 hours after launching. The previous secretary to this club, prior to leaving to join the R.A.F., set up a new club record for the Wakefield types with a flight of 3 min. 30 sec. as a parting gesture. The new secretary is now Mr. H. J. L. Moore, 85 Hinckley Road, Earl Shilton.

Records list of the HUDDERSFIELD AERO-MODELLERS' SOCIETY is as follows:

WAKEFIELD TYPE R.O.G.

W. Bainbridge ... ... 3 min. 30 sec.

WAKEFIELD TYPE H.L.

R. Calvert ... ... 4 min. 11 sec.

GLIDERS.

T. D. Bower ... ... 2 min. (lost in fog)

The SWINDON M.A.C. is just over a year old and has a membership of 58, including three lady members. The youngest member is 10 and the oldest 70, so here is another concrete instance of what a universal sport is. This club seems to be run on very sound lines, and a number of activities reported strike me as being very very good. A windsock is flown at meetings and a lock-up box is installed on the club ground. This contains the take-off sheet, rope enclosure and a 25 ft. steel rod in 5 ft. sections for retrieving models from trees. It is proposed to add a first-aid box in the near future. (Is this for treatment after going after those models that the pole will not reach?). A silver cup is held by a member for a period of six months for the most "meritorious" performance, this not necessarily being in the flying field, and can include any service rendered by a member on behalf of the club. Squadrons have been formed, each with its own insignia and leader. Inter-squadron competitions can be arranged. Club records stand at R.O.G. 2 min. 38 sec., H.L. 3 min. 0 sec., gliders 60 sec., and semi-scale 85 sec. Stop-watches are presented to members who break any existing club record by a margin of five seconds or more.

Mr. Rippon set up a record for the NORTHERN HEIGHTS M.F.C. new flying ground with his new "Flight"

cup model. This was officially timed for 16½ min., and the model eventually landed some miles away some 35 min. later. On the same day Mr. Threlfall did 8½ min. O.O.S. —yes, his model, you fatheads. Mr. I. W. Hall, who is well known as a duration flyer, is now keeping the club end up in the Army. He was awarded the Championship of the Anti-Aircraft Command for Model Aeroplane Building with his model of a Supermarine Spitfire. Mr. E. Buggue won a winch launch glider event with an aggregate of 78·5 sec., Mr. K. Johnson running very closely with 78 sec. Mr. Coote, president of the club, has suggested that models of German military 'planes be constructed by the club and displayed locally for identification purposes. It strikes me as a very good idea.

Mr. C. Sellwood, of the SALISBURY AND D.M.E.S., has set up new biplane records for the club, the times being H.L. 164·5 sec. and R.O.G. 203·5 sec. Mr. J. Lailey is leading in the Neale Cup, his average being 64 sec. for nine flights. With the calling-up of Bob Read, future communications to this club should be addressed to Mr. K. W. Scammel, 19 Nelson Road, Salisbury.

The FORFAR M.A.C. held an exhibition in their club rooms followed by a rally in which members of the DUNDEE M.A.C. took part. Results:

CONCOURS D'ELEGANCE (Sheriff Medal).

1. R. Coutts.
2. W. Machon.
3. C. Craikhead.

DURATION (Members of Forfar M.A.C.).

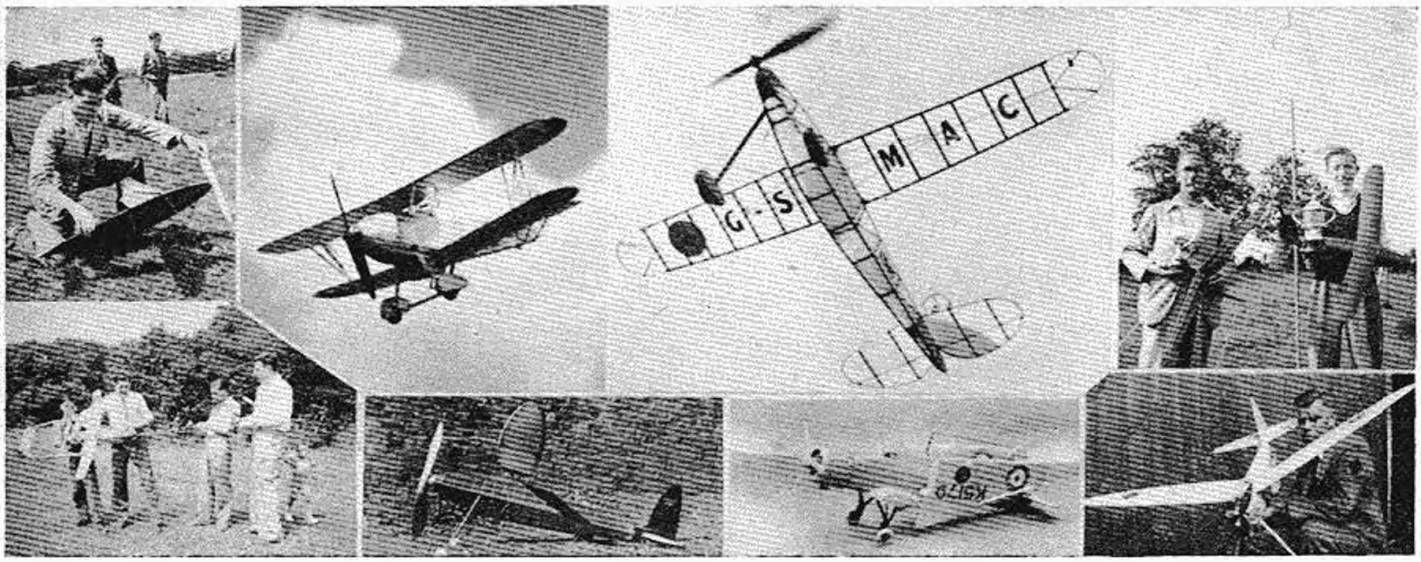
1. R. Coutts.

DURATION (Open).

1. D. Valentine (D.M.A.C.)	...	2 min. 55 sec.
2. B. Sherriff (D.M.A.C.)	...	1 min. 49 sec.
3. D. Robertson (D.M.A.C.)	...	1 min. 40 sec.

The EDINBURGH M.F.C. have been fortunate to find a fine flying ground just on the outskirts of Balerno, and the first official meeting produced some fine durations; the best of these was 3 min. 8 sec. by Mr. E. Knox's biplane, which constitutes a new club record. Mr. M. Gray raised the club light-weight record to 3 min. 28 sec., and the same model clocked an average of 2 min. 13 sec. for six flights. One ambitious member has constructed a flying boat and has greatly assisted the local farmers in their ploughing up campaign.

An informal competition staged by the EAST BIRMINGHAM MODEL AERO CLUB took place under excellent conditions. In a trial flight on half-turns Mr. D. Turner's model clocked 13 min. 5 sec. O.O.S. and was unable to compete subsequently. This constitutes a new club record, and the same 'plane holds the R.O.G. record with a time of 2 min. 15 sec. Mr. G. S. Hinde won the event with an average of 83 sec. A branch of this club is now operating at South Yardley, under the direction of Mr. G. Smith, 7 Homecroft Road, South Yardley, who will be glad if any interested persons in that district will contact him.



Top (left to right), Guess who! Nice shot of a Hawker "Fury," built by Mr. J. Smith, of Redditch. "Lincol" in flight at the Swindon club ground. Messrs. Davies and Grant, winners of the Farmer Cup and the Lindsay Everard Cup respectively. Bottom (left to right), Messrs. Cosh and Baines wind up the latter's record-holding "push-puller." Light-weight model by Mr. White, of Blackheath. A "Skua," built by Mr. D. Jones, of Boscombe, prize-winner in the Skybird Rally. Mr. H. F. Gelsthorpe, of the Newark club, with his gas model.

The BRADFORD M.A.C. have a very good entry for the "Flight" Cup. A number of the Halifax members also turned up to join them in a pleasant day's flying. There was practically no wind and an overcast sky, but there were no thermals, and it is possible to judge the efficiency of the various members entered much better than usual. The majority of the machines were streamlined parasol type with taper wings, and one definite fact brought to light was the great increasing glide by using a folding propeller. As a matter of fact, these chaps say good-bye to the old type propellers from now on. Mr. R. F. L. Gosling made the best Bradford Club time with 180·5 sec. followed by Mr. W. Lee 167·3 sec. and Mr. S. Taylor 166·8 sec. These chaps like the size and handiness of the new formula model, but would appreciate a little more power for windy weather, and suggest 1½ oz. instead of 1 oz. of rubber. Has anybody else any views on this matter? If so, we should like to hear them.

Having now effected affiliation to the S.M.A.E., the HALSTEAD BAPTIST M.A.C. is expecting a more progressive and successful phase of its life. Mr. Ince won a

recent contest with his "Condor Clipper," and many models were smashed owing to the extremely high wind.

In a high wind and very restricted ground limitations Mr. Hughes-Freeland won the Wakefield Class event at a recent READING AND D.M.A.C. meeting, while Mr. Chandler won the gliding event with 89 sec. O.O.S.

ODE TO AERO-MODELLING.

The dinner gong has sounded long ago.
The flying field lies empty, wide and free.
One aero-modeller stays, with sweaty brow,
His Wakefield rests majestic in a tree.

—P. J. FARR.

Mr. E. Snape won the "Pioneer" Cup of the SWINTON AND D.M.A.C. with an average of 252 sec., followed by Mr. L. Mellor 146·25 sec. and Mr. C. Bradshaw 116·9 sec. Nearly all the members are on A.R.P. and L.D.V., but still manage to find an odd spot of time for model-flying.

A well-known Manchester modeller, Mr. Ken Bletcher, 2 Leacroft Road, Chorlton, Manchester 21, will be pleased to hear from any of his old friends from the WINDSOR (Manchester) M.A.C. He has been in France and stuck in some of the wilder corners of England recently, and would be pleased to hear from any of the old lads with whom he has lost touch.

The FURNESS M.A.S. held an open rally on June 9th, and unlike our Irish friends had perfect weather for the event. Three events were run, the winners being Mr. Vanner, of Furness, two events, and Mr. Wheeler one. A team event was won by the Furness club with a total of 642·1 sec.

Well, that's all for this month. I'll be seeing you next month again. THE CLUBMAN.

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