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Vol. V No. 55
JUNE · 1940
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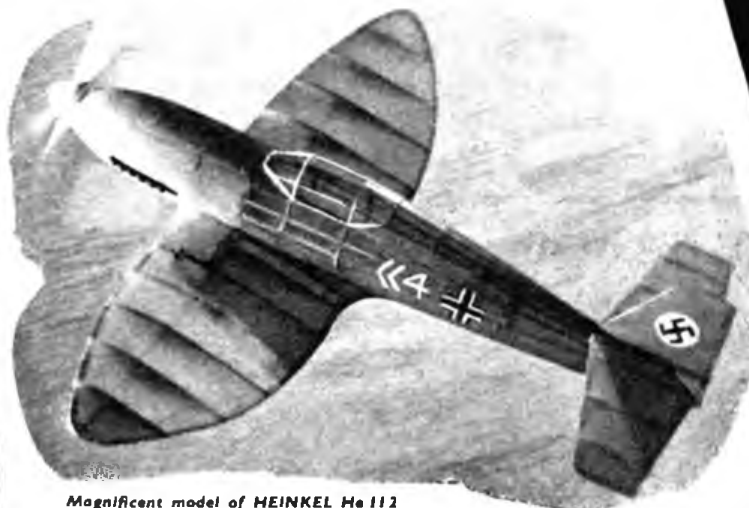


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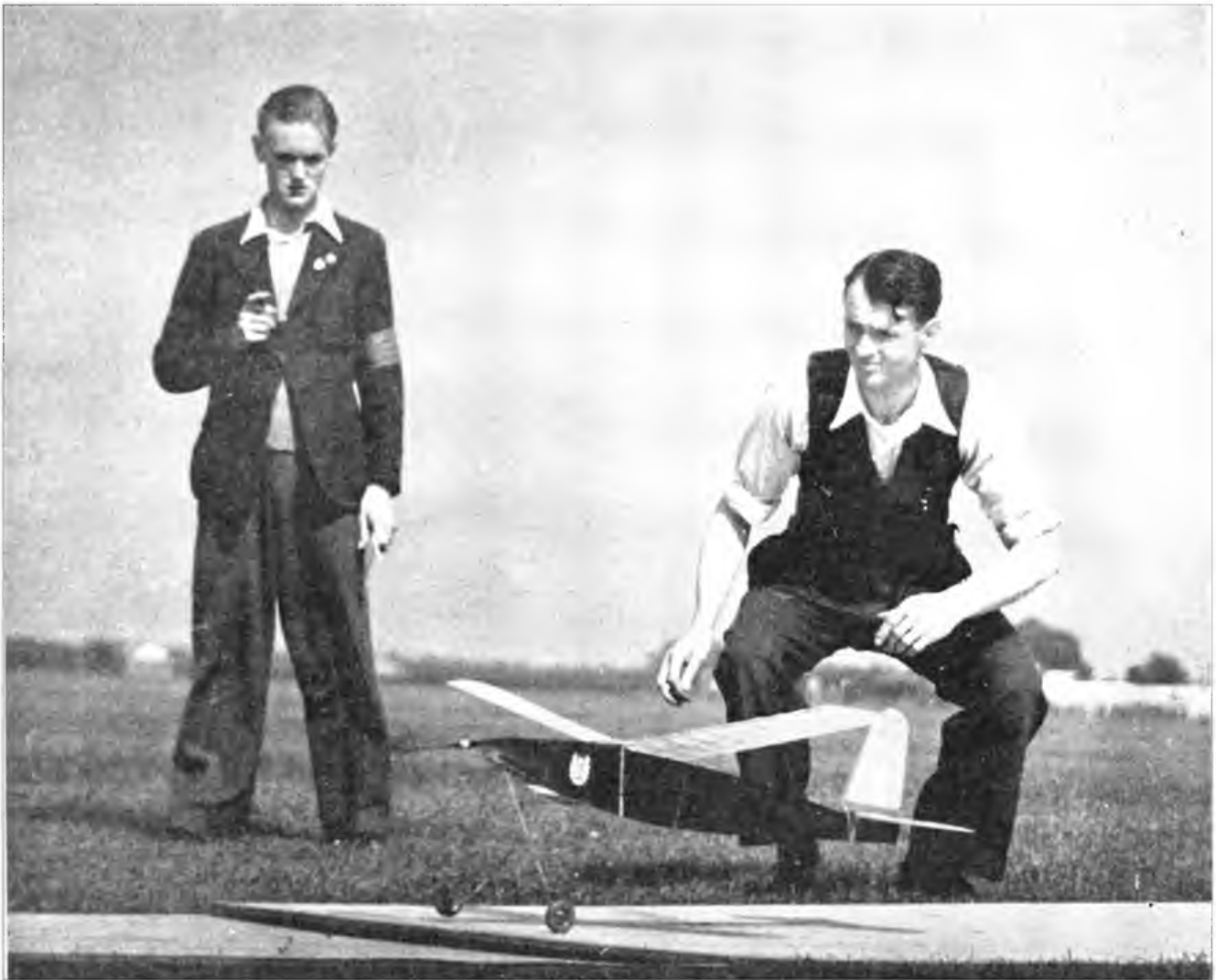
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"HAPPY DAYS ARE HERE AGAIN"



Now that the thermometer has climbed above zero—and there appears a sporting chance of it remaining there—aero-modellers will be thinking once again of “happy days” on the flying field. Here is an “action” photo, taken by Mr. R. Dove, at the National Cup Competition last August. Mr. F. Almond has just released his model, and timekeeper Cordrey will release his finger on the stop watch—when the other wheel unsticks!

The article by Mr. D. A. Russell, on his 8 in. span petrol 'plane has been held over until our next issue.

The AERO MODELLER

JUNE - - 1940
Vol. V. - No. 55

Tel. Leicester 65322

INCORPORATING
"THE MODEL AEROPLANE
CONSTRUCTOR"

Editorial



NE of the most valuable and pleasurable features of the aero-modelling movement is that it has extended to all parts of the world.

The competitions

for the Wakefield Cup during recent years have led to the "coming and going" between teams from this country and several others. In addition, officials of the S.M.A.E. and also quite a number of aero-modellers have visited practically all the countries of Europe, and in return we in this country have extended our hospitality to aero-modellers from all over Europe.

Aero-modelling has thus become truly international during the past few years, and for the very reason that our contacts, personally, with aero-modellers from foreign countries have been so friendly, we have felt that more than a passing reference to the present war would be out of place in a journal such as this; less still is this a page on which we should discuss politics, international or domestic.

We deplore this war, and so, we feel sure, do those same keen aero-modellers in other parts of Europe to-day. However, in this month's Editorial we must perforce refer to the present international situation in so far as it is responsible for a slight reduction in the number of pages in this issue, and the fact that the price has now to be increased to eightpence. Readers will have latterly noticed in the Press reference to large increases in the price of paper, and more recently, reference to the fact that supplies from Scandinavia are now in abeyance. We feel sure it is unnecessary for us to further dwell on this aspect of the position than to point out that THE AERO-MODELLER has by no means led the way in regard to a price increase or a reduction in the number of pages—in fact, it was one of the last journals to do so. We do not anticipate having to make any further increase in price and, by using slightly thinner paper, we expect the reduction in the number of pages to be quite nominal.

Readers may rest assured that as soon as conditions permit the price will return to normal.

Exports of British Aviation Journals.

Speaking recently in the House of Commons, the Secretary of State for Air said that it was not the Government's policy to restrict the despatch abroad of British aviation Journals: "They were of high repute and provided a means of making known to the world the excellence of our products."

We are glad to know that the Government realises the

importance of the aviation journals to this country, and we are proud to feel that THE AERO-MODELLER, which of course, is exported to all parts of the world, is able to do its share in upholding the prestige of British aviation.

Exports of Model Aircraft and Supplies.

As part of the country's drive for export trade, we publish in the centre pages of this issue a display advertisement on behalf of some twelve of our advertisers. Readers who wish to make use of the double-page plan underneath may easily withdraw this by carefully opening the two wire clips by which the pages are bound together. The advertisement and the plan should be carefully lifted out, following which the advertisement should be replaced and the clips bent back into their original position. Owing to the importance of this appeal we have thought that this advertisement should be given the greatest prominence possible.

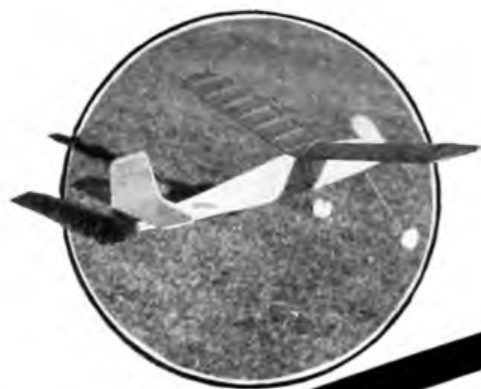
As we go to press we hear that the Model Aircraft Trade Association has formed a War Export Group to negotiate with the Export Council of the Board of Trade regarding supplies and overseas development.

We understand from the Secretary of the M.A.T.A., Mr. C. J. Bradstreet, whose address is 92 Durham Road, E. Finchley, London, N.2, that the Export Council of the Board of Trade will not deal with individual manufacturers, but only through the medium of a recognised trade association.

At the Extraordinary General Meeting held by the M.A.T.A. on Sunday, the 19th instant, the Chairman, Mr. F. R. Barnard, made a strong appeal to all traders to join the Association and give it their fullest support. We endorse Mr. Barnard's appeal, and we would stress the fact that it is up to all retailers of model aircraft to become Associated Members of the M.A.T.A. The annual subscription is a quite nominal sum—10s. 6d.

We hope to publish further news of the activities of the M.A.T.A. War Export Group in our July issue. Meanwhile, we would again stress the fact that the only way that the retailers can obtain recognition from the Board of Trade is as members of a recognised association, and that, therefore, it is imperative that they communicate with the Secretary of the M.A.T.A. as quickly as possible.

Lack of space this month prevents our describing the many special features to appear in our next issue—other than to say that it will be our *Summer Number*. Readers must please place an order with their local model shop or newsagent to make sure of their copies. D.A.R



Presenting the... HALCYON

By C. WILLIAMS

All photographs by G. DIAMOND

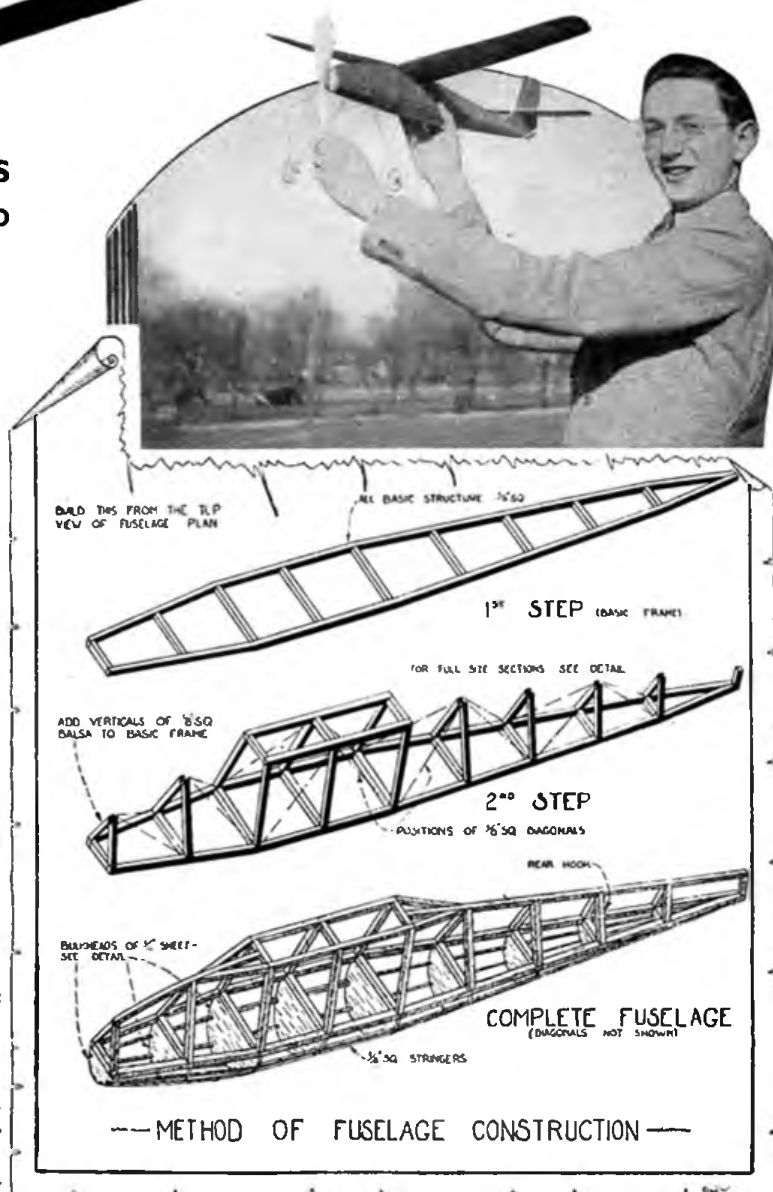
SPRING! Spring! Ah, Spring! When a young man's fancy, as poets are wont to tell, turns lightly to thoughts of love, 'n this, 'n that, 'n things he's been thinking of all winter. Modelers, especially those with a "winged" or "warped" twist in their minds, are coming out of their winter hibernation and are just itching to start into the real flying season.

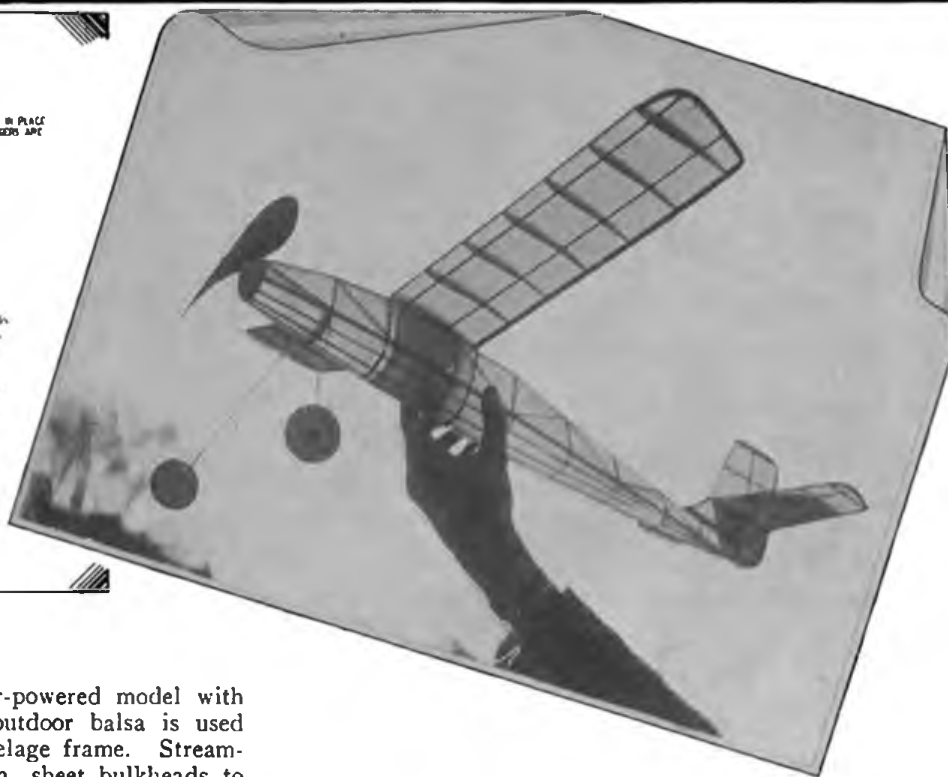
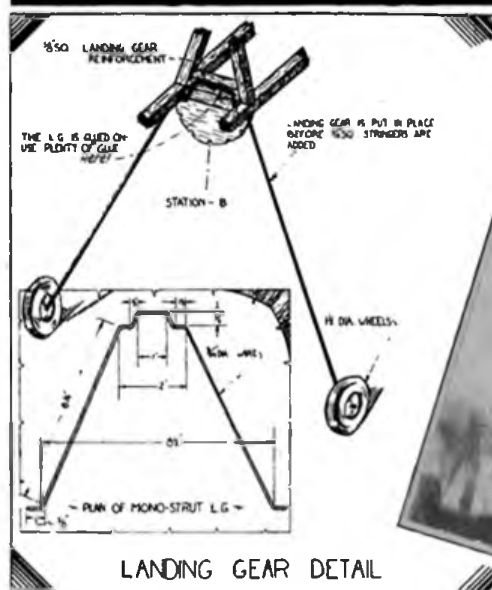
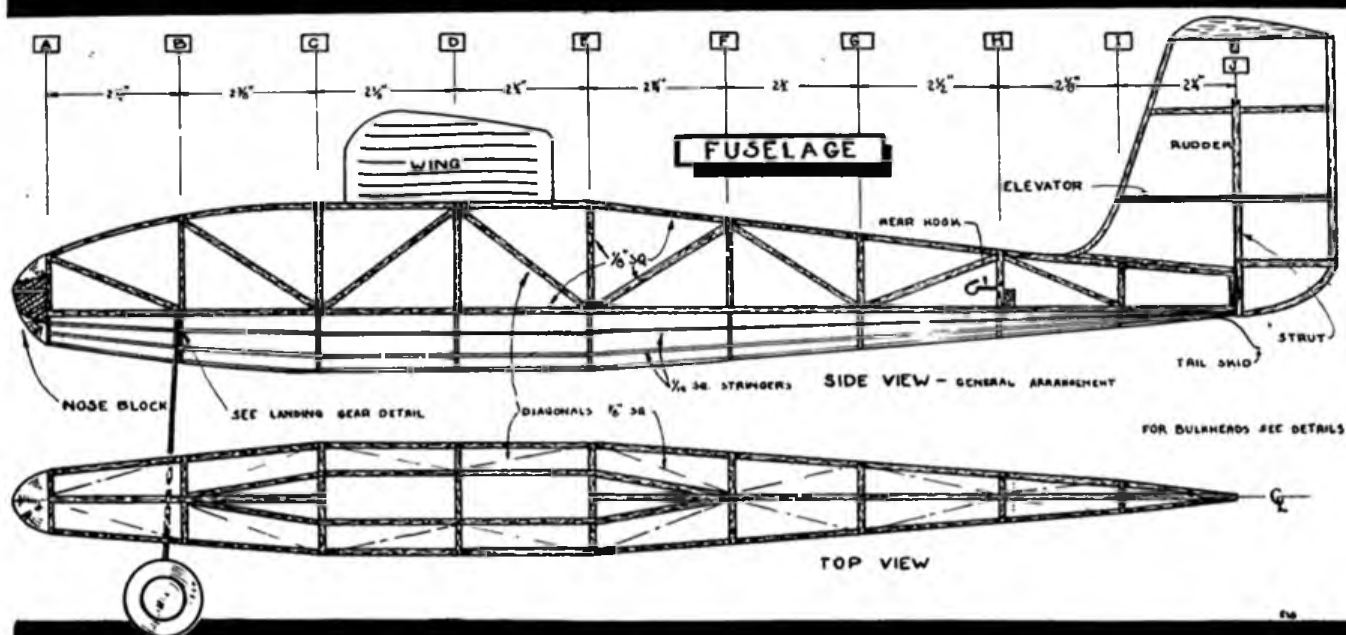
So-o-o-o-o, yours truly honestly believes that it would be a fine idea to stop what is jokingly referred to as hibernation and indulge in the making of the Halcyon. Which brings us to this:

The Halcyon is the snappiest model ever to churn the layers of ozone that surround this mad earth of our. Its flight is astounding! It will start the new flying season off with a bang! It will start your enthusiasm bubbling over and over again! The zest and gusto that will go hand in hand with the making and flying of the Halcyon will put your past efforts to foolish shame. You will want to take-off, zoom for altitude, dive, 'n stuff, 'n things! You will. . . ! And you will. . . ! Why, I could go on forever and ever, but I can see that the two kind readers who have stood with us this far are giving the balsa a greedy looking-over, so let it suffice by saying that the Halcyon will fill every mortal's desire for a flying model. It performs like an angel turned home-sick. Let's start with:

The Fuselage.

The fuselage is built on the principle of triangulation, which in this writer's humble opinion is the lightest/strongest method of making a structure. It was started as an experimental project, finally





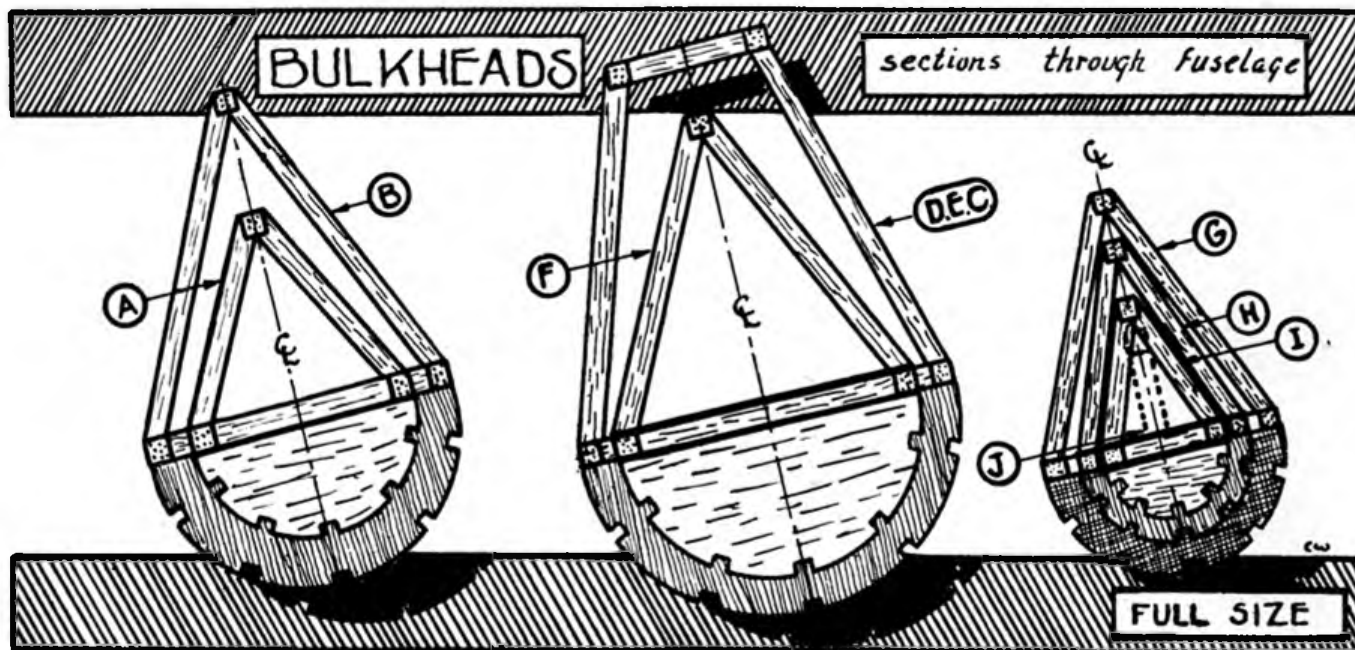
coming out as a completed rubber-powered model with unusual strength. $\frac{1}{8}$ in. square outdoor balsa is used throughout the building of the fuselage frame. Streamlining is obtained by adding $\frac{1}{8}$ in. sheet bulkheads to the belly of the fuselage.

The first step in the construction of the fuselage is to make the basic or primary frame. A full-size plan of the top view of the fuselage should be drawn on a sheet of paper and tacked to a flat surface. This drawing is made from the dimensions on the fuselage and bulkhead plans. The two longerons of the basic frame are laid on the drawing and the cross pieces added. This is the first step.

Sections through the fuselage are shown in full size (Bulkhead Fig.). The sections of $\frac{1}{8}$ in. square are made

directly on this full-size drawing. When all the sections are completed you will have them looking like V's, and in the case of stations "D," "E" and "C," where the wing sits on the fuselage, looking like U's. These are cemented to the primary frame, making sure they are perfectly vertical. Now, your fuselage will look like the one in Step 2. Add the remaining longeron, which is of several lengths, not one continuous piece. Diagonal bracing is effected by $\frac{1}{8}$ in. square balsa (soft) strips.

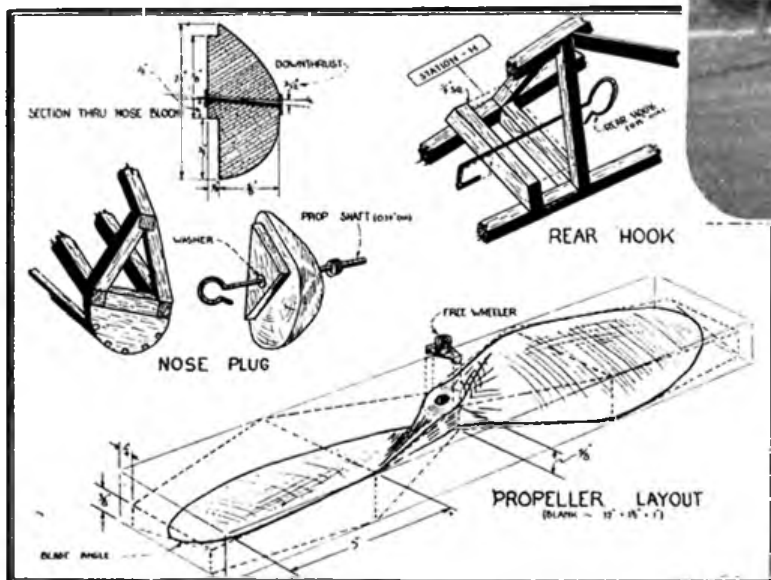
To complete the fuselage, cut the bulkheads, traced



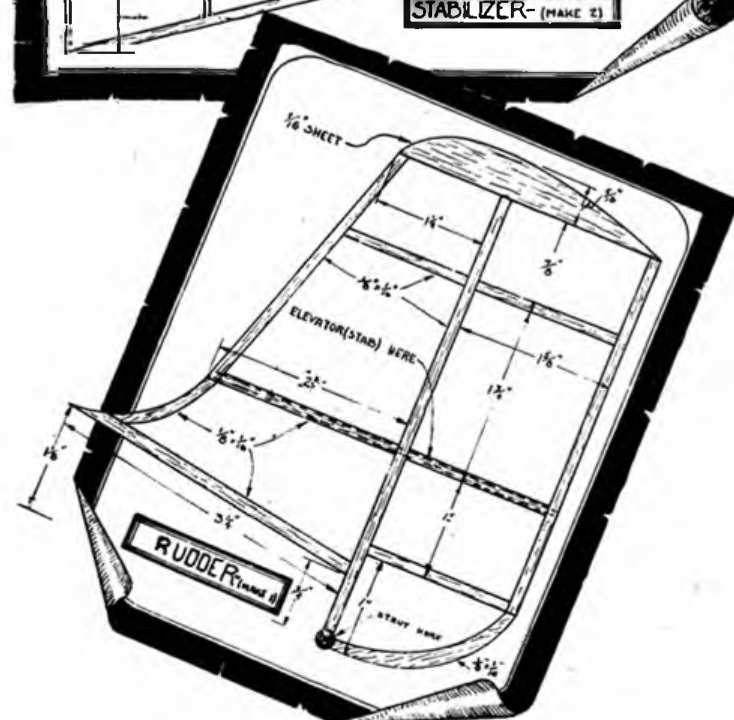
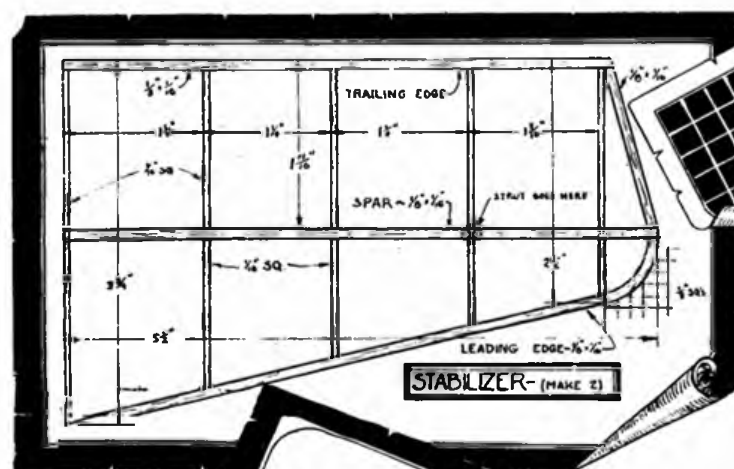
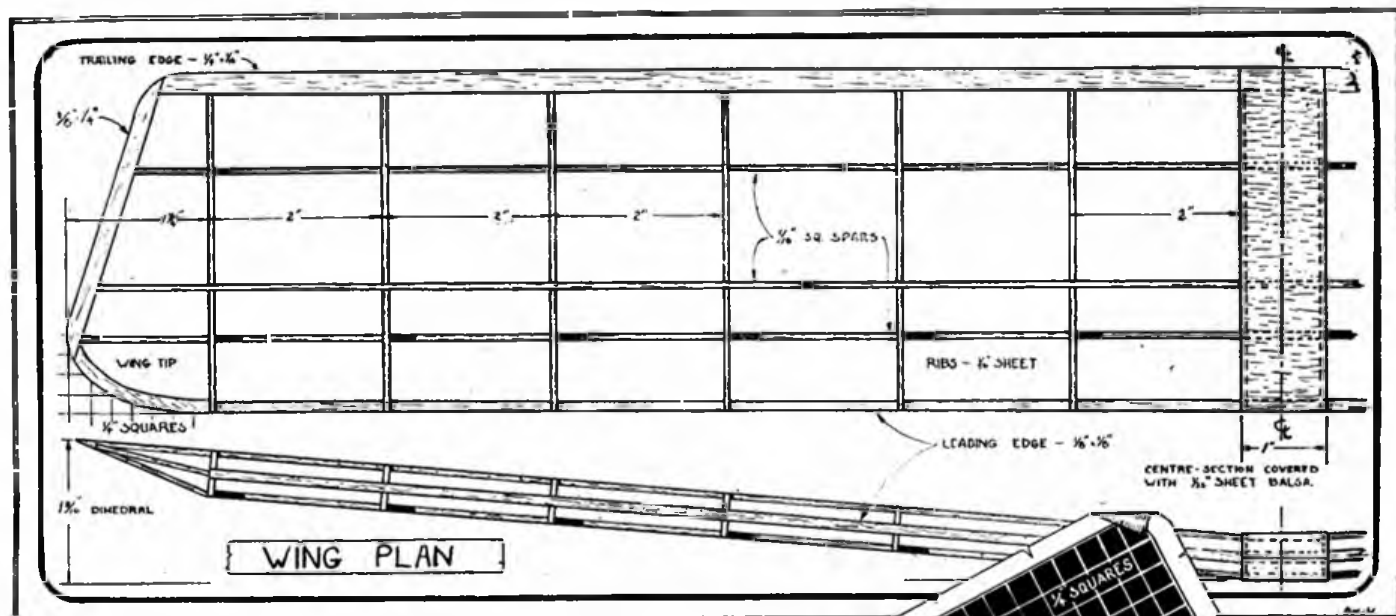
off the full-size drawing, from $\frac{1}{16}$ in. sheet balsa. Sandpaper the edges until smooth and glue to their proper places. Make notches in them to take the $\frac{1}{16}$ in. square stringers that run the length of the fuselage. The forming and attaching of the landing gear is well covered in the L.G. detail drawing. Do not forget the gear is put in place before stringers are cemented, and fits on at station "B." It is of the mono-strut type and bent from a single piece of $\frac{3}{64}$ in. dia. spring wire, being glued on. The landing gear is strong and will stand a terrific amount of rough and otherwise battering landings! With the landing gear in place and the stringers installed, you are ready to go ahead on the

Wing and Tail Surfaces.

Unlike conventional wings, ours has no main spar, the stress being taken up by three $\frac{1}{16}$ in. square spars. This was found to be sufficient. When constructing the wing, lay a 30 in. strip of $\frac{1}{16}$ in. square on a flat surface. On this mark off the rib positions lightly with a pencil.



In the plan only one half of the wing is shown. An accompanying drawing gives the correct shape of the aerofoil. The rib section closely follows the R.A.F. 32. Trace this on to cardboard and cut to shape. From this template make 14 ribs of $\frac{1}{16}$ in. sheet balsa. $\frac{1}{16}$ in. square notches are cut in them to take the spars, and also a notch to take the $\frac{1}{8}$ in. square leading edge. The wing tip is simple, and therefore no trouble should be encountered here. When the straight wing is finished, put



the required amount of dihedral into it. While this is setting, cover the entire centre-section with $\frac{1}{32}$ in. sheet balsa.

The tail surfaces are flat and consist of practically all $\frac{1}{16}$ in. $\times$ $\frac{1}{8}$ in. strips. Curved parts are of $\frac{1}{16}$ in. sheet.

The dimensions are given on the lay-out of the rudder and one half of the stabiliser surface. The other half of the tab. is identical to the one shown, both being flat. Note the position for attachment of the stabiliser, which gives the tail surfaces an "X" section—noted for its high efficiency—and where the $\frac{3}{32}$ in. $\times$ $\frac{3}{16}$ in. struts to brace the stabiliser go. Flying surfaces made, we finally arrive at the

Propeller and Other Details.

The propeller is made from a blank of medium hard balsa measuring 12 in. $\times$ $1\frac{1}{2}$ in. $\times$ 1 in. The blank is marked out by following the dimensions shown in the propeller drawing. When the blades have been roughly carved out, finish them with an aerofoil section, giving the whole propeller several coats of clear dope with fine sandings in between. A free-wheeler may be bought from your local supply house or mail order companies advertising in this magazine, and cemented into place.

The nose-block, made from a small piece of balsa, is cut and shaped as illustrated. Add the $\frac{3}{32}$ in. down-thrust and glue washers at both ends of the shaft hole to prevent it from being worn and enlarged. The propeller shaft is bent from .034 in. dia. wire, as is the rear hook. The rear hook is attached at station "H" with a $\frac{1}{4}$ in. square strip.

Cover the whole model with tissue and give the "works" at least two coats of dope. Power for this ship is found in 10 strands of $\frac{1}{8}$ in. flat rubber. The wing is held in place by a short length of rubber. This is sufficiently strong to hold the wing in place, giving your model additional protection in the event of a smash.

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"PETROL TOPICS"



By Dr. J. F. P. FORSTER

STRIKING proof of the demand for "Petrol Matter" is already afforded by the almost overwhelming response to my initial request for co-operation in making this feature what we "Petroleers" have long wanted. I can't begin to thank you all individually for your letters, and you *must* see that the editorial ration of so many words makes it quite impossible to deal with the points raised in all your letters. This applies still more to the numerous photos submitted.

However, I do feel bound to acknowledge the splendid response from Lone Hands who, as I suspected, are the ones who are doing most of the genuine experimenting and original designing in the country at the present time. With a few exceptions most of the "clubites" go in for building commercial 'planes from kits, or some well-tryed design from begged, borrowed, or stolen plans. (Will some of my younger readers kindly note that I am *not* in a position to supply them with plans, and in any case I want to encourage original design based on their own and others' experience). My advice to those who have none is, "Buy a kit and get on with it." There are plenty of good ones on the market. They will soon gain enough to try and go one better. If they smash it up, well, "Necessity is the mother of invention."

I am open to correction *re* "Club-ites'" originality.

It is, perhaps, early to judge, having had more letters from Lone Hands than "Clubites." Some do not specify to which category they belong. Will you all please do so in future, as I want to publish some statistics some day. All letters

are filed and classified, and all contribute either directly or indirectly to the general make-up of this feature, even if not quoted verbatim.

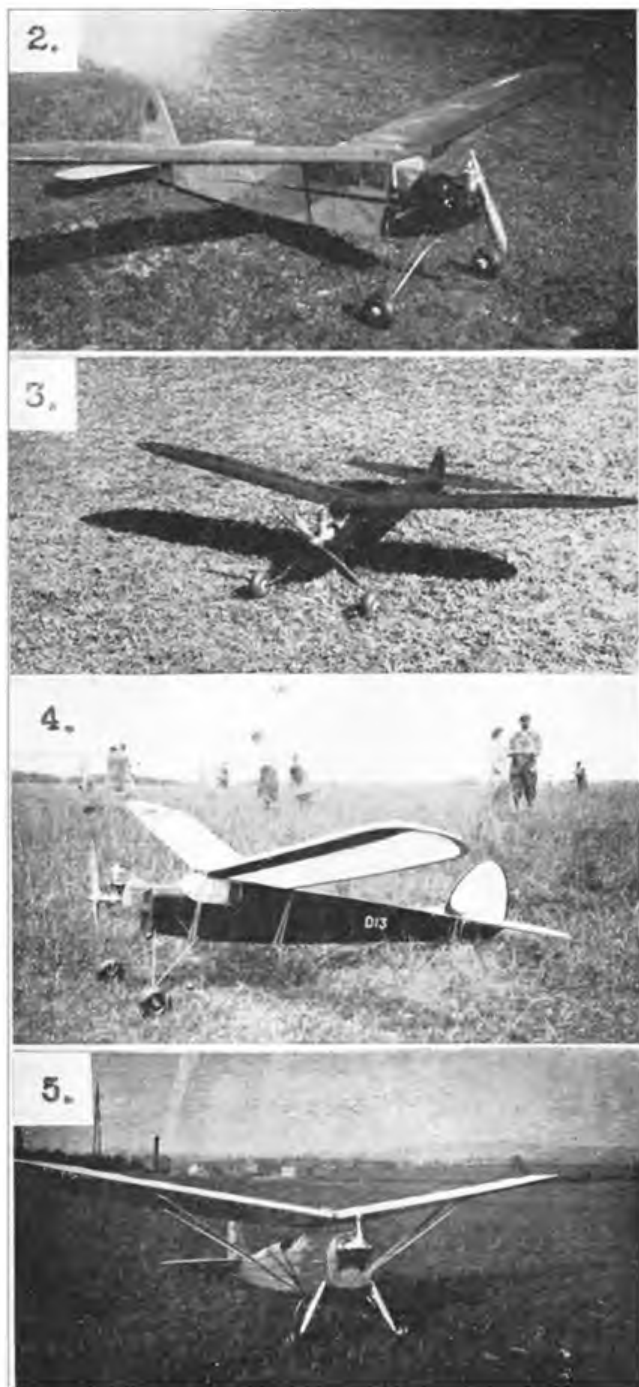
In order to deal with as many as possible, I propose (with your approval) to give over this feature, every second or third month, almost entirely to correspondents raising points, and relating experiences likely to be of interest to other readers. As to photos, I am resolved to give preference to 'planes of original design, for illustrations of commercial machines can (or should) be perfectly well seen in the advertisement pages of this journal.

An anonymous correspondent who builds his own engines (and who has been *actually flying* radio-controlled jobs for two years!) remarks that one of his early engines consumed $2\frac{1}{2}$ pints of juice per hour, must be the glutinous exception, as most of us are well satisfied with the remarkable amount of flying that can be done on a few tablespoonfuls of "Pool." I will spare the blushes of the beginner who dare not run his "beeeautiful" new engine for fear of ruining it on Pool. Well, I don't know how he proposes to get hold of anything else, and I suggest that he learns to say that "grace" which goes: "For what we are about to receive may the Lord make us *truly* thankful!" I haven't detected any loss of power in my own engines since the advent of "Pool." As to damage to engines, Mr. P., we have far more to fear from pool oil (if it comes) than from pool petrol.

R. Elsegood, of Grimston, King's Lynn, sends us several good snaps, including the one of himself and his nice-looking Cloud Airmaster. Also a "Miss America," built by a friend of his. These two are Lone Hands working *au pair*, a very happy arrangement. The calling up of a third friend, working at the radio side of their experiments, has temporarily split up what promised to be a good combination. (Photos 1 and 2).

Michael Watkins, of Ffynone, Swansea (who wrote in the February issue on model activities in South Africa) sends a large assortment of snaps, taken out there, mostly of well known American commercial 'planes, fitted with high-powered engines in relation to their span. At altitudes of 5,000 feet this is necessary, but as might be expected, when brought down nearly to sea level, they climb almost vertically. He also has been experimenting with a small home-made accumulator, but fears to use it on his coil because it registers more than four volts. This is as it should be, surely, with no load? I suggest he





tests its voltage with the load of the coil in circuit, and he won't worry any longer about burning out his coil. I include a snap of a pretty 5 ft. 6 in. span job powered with a Brown, and weighing only $2\frac{3}{4}$ pounds, and a rather low thrust line at that. No wonder they climb! (Photo 3).

Bernard Morgan, the one-handed member of the Cardiff Club, and a newcomer to petrol ranks has, in spite of his handicap, turned out a well-finished commercial Red Zephyr, which performs well. A photograph of this appeared in Club News in the March issue.

S. C. Stevens, of the Bristol Club, designs his own

machines. His latest is a slab-sider of 6 ft. span with a fixed cantilever undercart, and powered by an uncowed upright Cyclone on a fixed engine mount. In spite of all these "points" its performance sounds first class. (Photo 4).

H. C. Fello, of Gravesend, who has recently left the ranks of the Lone Hands to join the North Kent M.A.S., is an *old* hand, and sends us the prettiest photograph of the month (see title piece), being a recently published design by the American, Henry Struck, just completed by him. The neatly cowed and inverted Gwyn and the position of the tail-plane should make for stability. He rather naïvely remarks that he has never been successful in running his engines inverted. Is this a "model of an aeroplane," Mr. Fello, or has it now gained promotion to the rank of "Model Aeroplane?" (*vide* April "Topics.")

W. C. Evans, another Lone Hand, of Horsham, Sussex, is having good results from his first machine (incidentally the first he has ever seen off the ground, and his own design). Christened "Pygmy Eagle," being 8 ft. span, with nearly 9 square feet of area, it is powered with a Cloud 9 cc. which has performed well.

P. Tongue (L.H.) of Enfield, is building a 4 ft. 10 in. job, powered with an Ohlsson 23, while, by way of contrast, A. W. Raugh, another L.H., of Dagenham, is on a 9 ft. job powered with a Forster $\frac{1}{2}$ h.p.

An interesting letter comes from E. H. Allott, Flying Instructor at Yate, whose name in full-size record attempts may be familiar to many readers. He is finishing a 6 ft. scale Leopard Moth. This always did make a good flying model, and I hope to publish snaps of this in action. He also has had trouble inverting his Gwyn Aero, which may interest H. C. Fello. The plug oils up. Reduction of oil ratio causes overheating of the aluminium head till it warps, resulting in terrific loss of revolutions after 20 seconds or so. If stopped for about half a minute all is well again for a further 20 seconds, but it then heats up again. He proposes to make a steel head. Let us know results, Mr. Allott. I had similar symptoms (except for oiling up) on one or two days last summer with a Brown on my flying boat. I never explained it to my satisfaction, since it only occurred on certain days, and I even went so far as to add a Cyclone detachable head to the Brown to improve cooling. This looks as if the cause was in my case insufficient oil; I evidently made up a weaker mixture some days than others before the day's flying.

H. C. Flamark (L.H.), of Audley, Staffs, has had great success with his version of the original 'plane on

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which my old P.3 was based in her strutted and parasol days. He powers his with a Brown. Now building a 9 ft. monocoque. I note with satisfaction that he uses knock-off mounting. (Photo 5).

Another C. E. B. fan is Lieut.-Col. H. J. Parham, at present with the B.E.F. He has done some really interesting work with a fully slotted wing, a very fine photograph of which forms the title piece this month. He is all for extremely simple models for real experimental work, with which I heartily agree. All his work is entirely original, based on his full-size experience, as he has seen nobody else's models in the air. The "flaps" effect of this wing unfortunately causes a somewhat brick-like glide, but its lift coefficient is very high, for with an unslopped wing of equal weight the model requires nearly twice the wing area. The remarkable thing is the extremely slow flight under power, the stalling speed being greatly reduced.

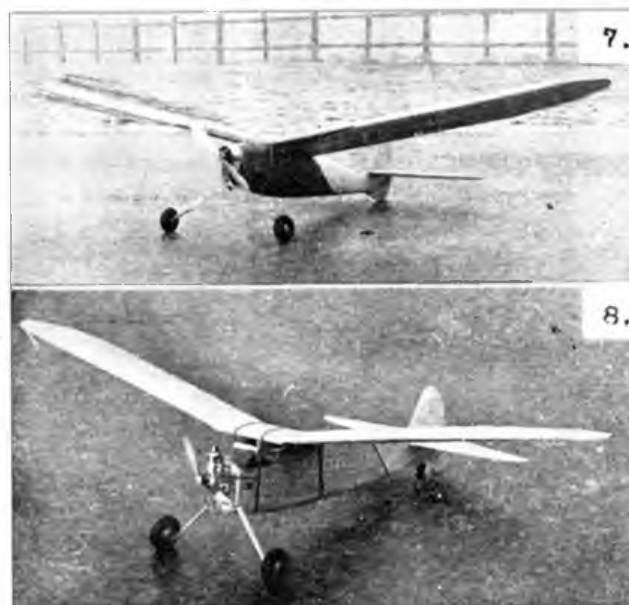
To three-bladed propeller fans, may I suggest you keep all your broken propellers. I have made up several three-bladers by laminating three hubs belonging to the intact halves of old two-bladers and reducing the radius during the process of balancing. Peter Matthews, member of Woodford Club, sends us photo 6, of his Standard Buccaneer, fitted with an elaborate three-blader made up from six laminations. Try my method for labour saving, Mr. Matthews!



A single-blader is fitted to a very clean-looking monocoque job of his own design, by A. C. Chapman. Send me a nice sharp photo for reproduction, Mr. Chapman.

I will spare the blushes of the enthusiastic Scot from Markinch, Fife, who declares quite glibly that he has been "dealing" with petrol models for two years, during which time he has had "two successful power flights." Tell us when your next "annual exhibition" is due, Mr. B. Will any reader thereabouts offer to give him a demonstration of 20 flights in an hour if his spirits begin to flag? He certainly deserves a prize for truth, if not for perseverance in the face of failure.

May he take heart from the anonymous correspondent from "somewhere in England" (Och! these Sassenachs!) who gives a most illuminating account of his work on radio-controlled models, two of which he has had definitely flying, and the last one very successfully indeed. His loadings are around 2 lb./sq. ft., and his powers have had progressively to increase to $\frac{3}{4}$ h.p. After making several engines himself, he finally used a Mercury



of this power, fitted with a variable pitch airscrew (details please, Sir). He has always used three controls with a selector of his own design. A single valve receiver has proved sufficient, using a 10-watt crystal controlled transmitter, fitted with miniature joy stick and throttle lever. Most people feel that a throttle and rudder are all they could wish for, but his 'plane is not entirely inherently stable, and being a full-size flyer, he is not content with just flying round the sky, but wants to do quite ambitious acrobatics. Here is a man running before most of us are even crawling!

Ian Hannam and Lester Palin, an industrious pair of Lone Hands at Northwich, have so far had best results with large models of American design. More recently they have each completed two of their own, photos of which are promised. I include two photos of their earlier efforts. The monocoque job is a Ben Shereshaw's "Nimbus" of 14 square feet, powered with an 18 cc. Comet. (Photos 7 and 8).



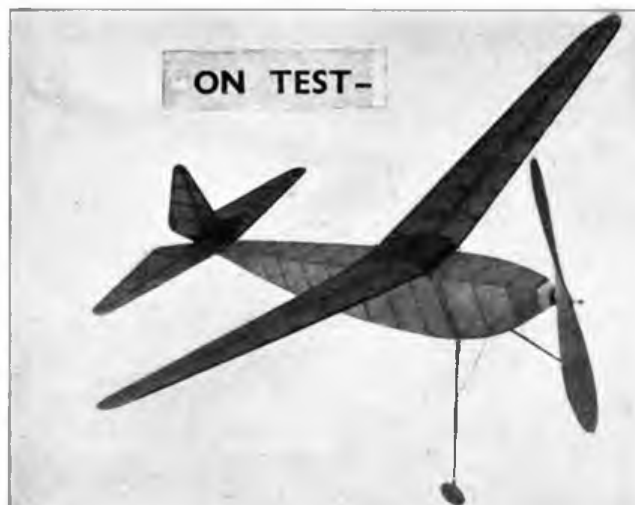
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Report by TEST PILOT"

MESSRS. Model Aircraft Stores (Bournemouth) Ltd., of 127b Hankinson Road, Bournemouth, Hants., are well known as suppliers of high-class materials and accessories for the aero-modeller, and they have submitted two of their extensive range of kits for test this month. Both of the popular duration type of machine, they are the Veron "Hawk," and the "Veronite No. 1."

Checking firstly on the quality of materials supplied, these were found to be first-class in every instance, the balsa in particular being of very high grade. Various refinements, such as finely finished Ho-wood propellers and ready-made propeller shafts, screwed brass bushes, and Paulonia wheels are features of both kits, whilst the "Hawk" has such notable refinements as a complete set of ready cut ribs for the tapered wing, and a series of specially cut plywood formers for fuselage construction. In all cases the materials supplied were ample for the job, and the instructions are complete and detailed enough for the veriest novice.

Starting with the "Hawk," a model of 38½ inches span, the fuselage is constructed to general model aircraft practice as far as the two sides are concerned, but it was when assembling into "box" form that the handiness of the preformed ply formers became evident. Stationed at nose, tail and two panels at the position of wing fixing, these are accurately cut to size, and ensure a true and square finished fuselage. This feature particularly appealed to me, as I know many modellers have found difficulty with this "squaring up" on their first models.

Built mainly from ½ in. x ½ in. balsa, the fuselage, incorporating the ply formers, and strengthened at nose and tail with sheet balsa, provides an extremely tough and rugged structure, capable of taking the hardest knocks encountered under normal flying conditions.

The nose-block is built up from ½ in. sheet, laminated, and incorporates a screwed brass bush, accurately drilled to take the ready-formed 18 gauge wire shaft. Fitted with a spring free-wheel device, this shaft also embodies a winding loop. The only thing the builder has to do is to form the hook after threading the propeller and noseblock on to the shaft.

The rear rubber fixing is by a dowel—an easy and efficient method—and the undercarriage is of normal bamboo and wire specification, sprung into tubes fixed to the fuselage. No soldering is required at any stage in

the construction of this model, a feature that will please many builders.

The wing is an easy component to construct in this instance. All ribs are accurately cut from sheet balsa, and ready slotted for the tapered spar—also preformed, with the correct dihedral angle ready cut. Of tapered plan shape, the wing employs a ½ in. square leading edge, ⅜ in. x ½ in. trailing edge, and a deep centre spar on which the ribs are threaded. Bamboo tips complete a rugged and pleasing outlined wing.

Tail-plane and fin are constructed on normal lines, and are both light, yet strong. A bamboo peg incorporated in the fin locates the tail-plane, while a wire saddle enables setting of the fin for directional purposes.

The makers claim a best time of 25 minutes, with a 2–3 minute average for builders with even average experience. This I can verify, as, following the very explicit—and common-sense—flying instructions, the model I built flew practically straight off the board.

Using the specified motor of ten strands of ⅜ in. rubber, with the 14 in. dia. 20 in. pitch prop. supplied, the first flight following "glide-trimming" was made with 200 turns on the motor. A 53 second flight resulted, but the fin needed a bit of setting to counteract torque.

A fairish breeze prevented full turns being used on these tests, or the model would have been carried too far away, but on two-thirds maximum turns the model was consistently clocking 1½ to 2 minutes, and producing the flattest glide I have seen for a long time. Consistency seems to be an outstanding feature of this model, as not once during tests did this particular job turn in a poor flight, and I would say that, given time to thoroughly know the model, almost nominated times could be made.

The "Veronite No. 1" is of 28 inches span, and while not incorporating all the constructional refinements of the "Hawk," in general this kit follows the high standard of the latter. Ribs are printed out on to high-grade balsa sheet, and this machine incorporates a cabin-type fuselage, an ingeniously constructed elliptical wing and empennage, and an all-wire undercarriage.

Performance, whilst not quite up to the "Hawk" standard, is very good, and consistent flights of 1½ to 2 minutes should be readily obtainable. Good looks, combined with performance, place this model in the top flight of kits on the market to-day.

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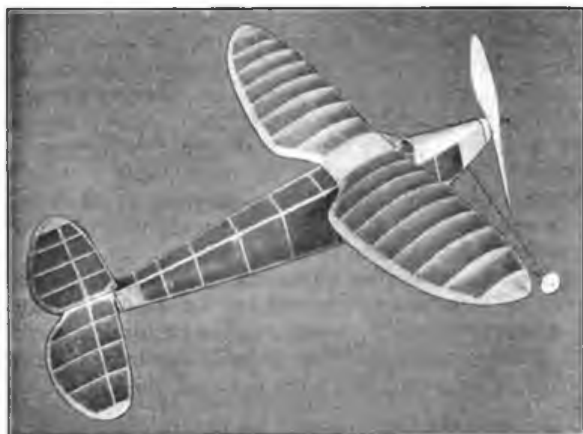
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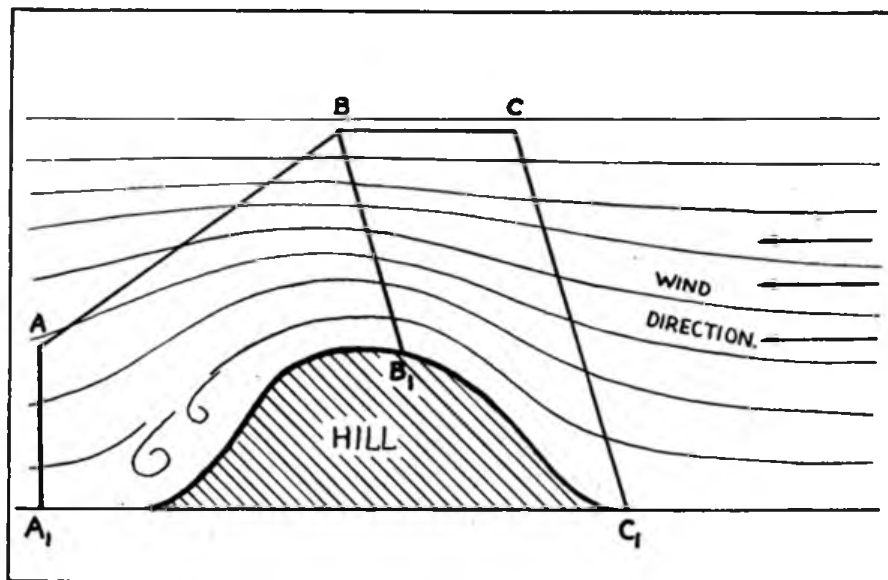
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"THERMALS"

FIG. 1

As pressure is lower up above, it takes the line of least resistance, and follows the latter course. (Fig. 1).

In the area marked B, B₁, C, C₁, is a region of swiftly rising air climbing up the windward side of the hill, whereas in the area A, A₁, B, B₁, there is a region of turbulence, in which down-currents are found.

Glider pilots utilise the up-currents in BC extensively when "hill soaring," their technique being to beat

backwards and forwards along the front or windward side of the hill, where the best up-currents are to be found.

Unfortunately, models have singular ideas about keeping head-on to the wind on the right side of the slope, and more often than not dash themselves to pieces on the hillside.

Nevertheless, plucky attempts have been made to get models to utilise the up-currents existing on the windward sides of slopes. A German modeller installed a sensitive "reed" control apparatus in a model sailplane, and, by whistling a different note, was to be able to control the direction of his model.

Elbert J. Weathers, in the U.S.A., also developed a rudder control for keeping his sailplane face on into the wind. His device consisted of having a weight, attached in a similar way to a mass balance, well forward of the hinge line of his movable fin. This device was found to be fairly satisfactorily on large models. (See F. Zaic's *Year Book*, 1938, p. 160).

Anything that tends to slow up the horizontal velocity of the wind will cause it to rise. Hence air moving from sea to land rises, causing useful up-currents along the shore, the added resistance of the land having a retarding effect on the wind's motion, causing a "piling up" of air over which the following air must climb.

Again, wind blowing across smooth fields towards woods will rise as a turbulent up-current where the wind passes from the smooth to the rough.

In fact, to generalise again, there is always a certain amount of turbulent up-current on the windward side of such obstacles as hills, woods, cliffs, buildings, etc.

(2) The second type, "up-currents due to convection," is far more important from the point of view of the aero-modeller.

Basically, these owe their existence to the important fact that warm air rises. This rising air is the "thermal" proper that we speak of with envy when someone else's model goes up and up and up.

Remember that cartoon, "His first thermal," in *THE AERO-MODELLER* a month or two ago? That was, true enough, a perfect thermal in miniature. But some may ask where sufficient heat is to be found to create large-scale thermals. The answer is fairly simple.

THE word "thermal" has become a term which is used solely by gliding and model flying enthusiasts.

A thermal is any upward moving mass or current of air. Sometimes, however, it is so weak as to have no noticeable effect on the flight of a model, so that, narrowed down to the term as accepted universally by model flyers, the correct definition of a thermal is: A mass or current of air ascending at a speed greater than the sinking speed of the model.

"Sinking speed," as applied to models, can only be determined—and then only roughly—during the glide, when the motor or fuel is exhausted. It is the speed at which a model sinks, in relation to the air around it, and is expressed in feet per second.

We hear so often of marvellous models with "flat glides," but few models have gliding ratios—"gliding angle" as generally used is incorrect—of greater than 10:1, while model sailplanes rarely exceed a 15:1 ratio.

A flat or horizontal glide can only be obtained if the model is passing through an up-current which is ascending at exactly the same speed as the model is sinking.

For example, if, while gliding, a model has a sinking speed of three feet per second, and is passing through an up-current ascending, also at three feet per second, it will remain in horizontal flight, neither losing nor gaining altitude.

If, however, the up-current is rising at six feet per second, then obviously the model will rise at a speed of three feet in every second, and has, as we say, "hit a thermal."

The model with a "flat glide" has, unfortunately, yet to be found. The most efficient sailplanes that have been designed have gliding ratios of less than 30:1.

Model flyers have to thank gliding experts and meteorologists for the knowledge that has been acquired regarding the origin and occurrence of thermals.

Generalising, there are two distinct forms of up-currents.

- (1) Upward deflection of wind caused by its striking hillsides and/or other obstacles.
- (2) Up-currents due to convection.

(1) When moving air blows up against a mountain or hill it must either go round it or climb over the top.

FIG. 3

By R. W. PARR

"HOT AIR"

We know that certain substances heat up much quicker than others on a sunny day. For instance, the sun will make concrete or corrugated iron quite hot, while water and other things like trees and grass remain cold.

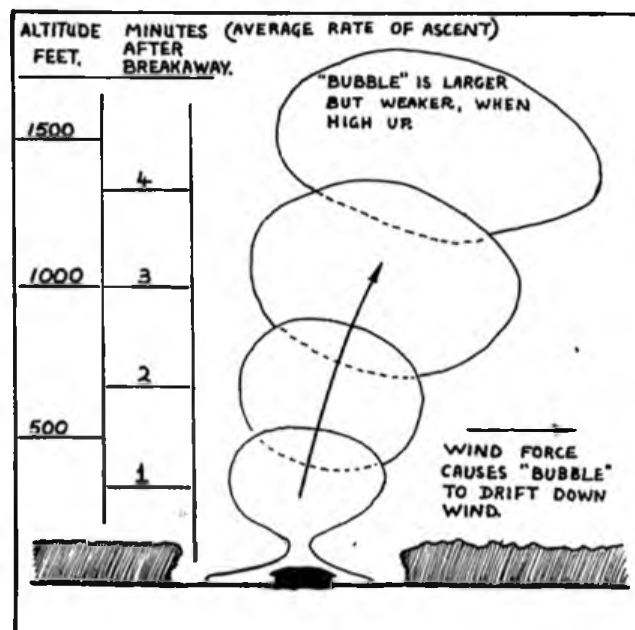
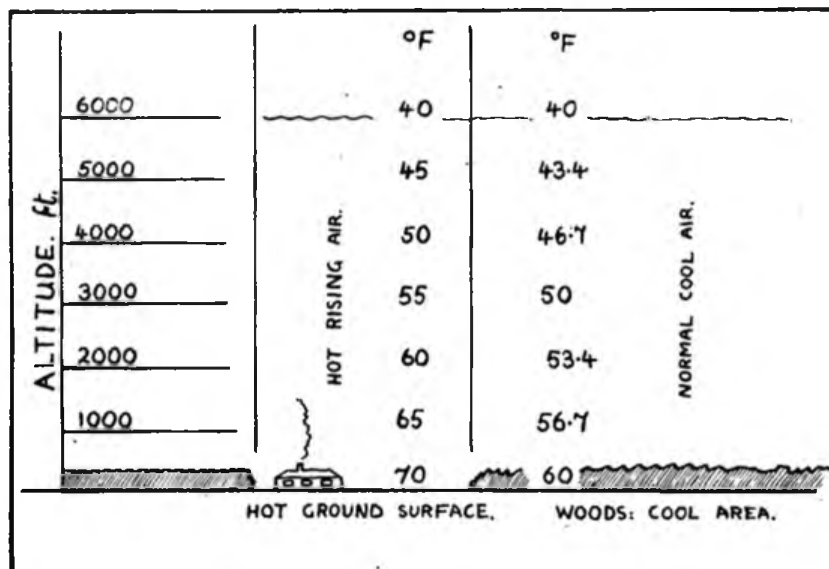
As an easy example, let's consider what effect a large house in the middle of a forest would have on the formation of a thermal. Imagine also a nice sunny day with little wind. (Oh, for such days in England!)

As indicated above, the air around the house will become several degrees warmer than the surrounding mass of air. Consequently, this warm air will have its pressure increased, and will tend to expand, and, as it can only expand upward, it begins to rise. The greater the difference between the temperature of the warm air and that of the surrounding air the faster and more powerful will be the rate of ascent of the up-current.

Now we all know that the higher we ascend the colder the atmosphere becomes. This is because, on rising, regions of lower pressure are encountered, with subsequent expansion and cooling.

The temperature of the cooler surrounding air generally diminishes with altitude at the rate of about 1° Fahrenheit for every 300 ft. of ascent. The warm rising air, however, cools at the rate of 1° F. during only 200 ft. of ascent. This difference is known as the adiabatic gradient. From an examination of Fig. 2 it is obvious that there will come a time when the rising column of air has the same temperature as the surrounding air, and at this point it will no longer continue to rise.

FIG. 2



In Fig. 2 it will be seen that if the air which has been warmed by the radiation from the house had a temperature of 70° F. and the surrounding air temperature was 60° F., then the "thermal" would rise to a height of 6,000 ft., and would then fade out.

Notable German soaring aces have put forward the theory that when the air round, say, a house is heated, it forms into a large invisible "bubble," which eventually gets so cumbersome that it breaks away from the ground and rises upward as a "thermal bubble."

From the experience of their observations they have suggested that under general conditions these "thermal bubbles" re-form and break away at the rate of once every ten to fifteen minutes. On only one occasion have I been able to check this where models are concerned. This occurred when a model built by Mr. K. Duke in South Africa made a very good flight of 18 min. one hot summer afternoon. After the rubber motor had run out the model hit a thermal bubble straight

away and soared to 1,500 ft. in about six minutes. There the thermal itself died out, because the model began a downward glide. After 13 min. it seemed as though the model was about to land, as it was very low—about 200 ft. up—when suddenly, over exactly the same spot as previously, after an interval of 12 minutes, the ship ran slap into the second rising bubble and climbed again to about 1,000 ft. This time, unfortunately, it drifted out of the thermal area and soon landed. But it was almost certain proof of the existence of a thermal bubble rising at a regular interval. Fig. 3 illustrates a thermal bubble, how it drifts slightly down-wind, and how it expands as more rarefied air at the higher altitudes is reached.

Certain terrain, as previously mentioned, heats up and radiates its heat to the air in contact with it more quickly than others.

Fig. 4 shows just off what ground to expect thermals of the convection type. During the

evening and at night this heating action is reversed, as the terrain that heats up quickly cools down quickly when the sun sets, while stretches of water, boggy or marshy ground, meadows, etc., which warm up slowly during the day—and over which down-currents are found—now begin to radiate their reserve stores of heat, causing quite substantial up-currents.

Heat obtained from fires, chimneys, etc., naturally gives added impetus to the strength of up-currents.

It must not be thought that sun is essential for convection thermals, as these can be formed in other ways. Very powerful up-currents indeed are caused by the approach and passage of a cold front or clouds threatening a thunderstorm. Fig. 5.

In the case of a thunderstorm, the cold air acts as a wedge, driving the warm air in front of the disturbance upwards and outwards. The force of the up-currents can be gauged when it is remembered that hailstones weighing over half a pound can be supported in them. This means that the air is rising upwards faster than a heavy hailstone can fall, and in these conditions even the proverbial tea tray will soar.

Cloud formations give a good idea as to where thermals are to be found. Storm clouds or white "cotton wool like" cumulus clouds indicate that thermals are rising directly into them, and are in fact forming the clouds, in the case of the cumulus type. The writer has himself once been fortunate enough to actually "see" a thermal. This was caused by a grass fire, and the smoke traced

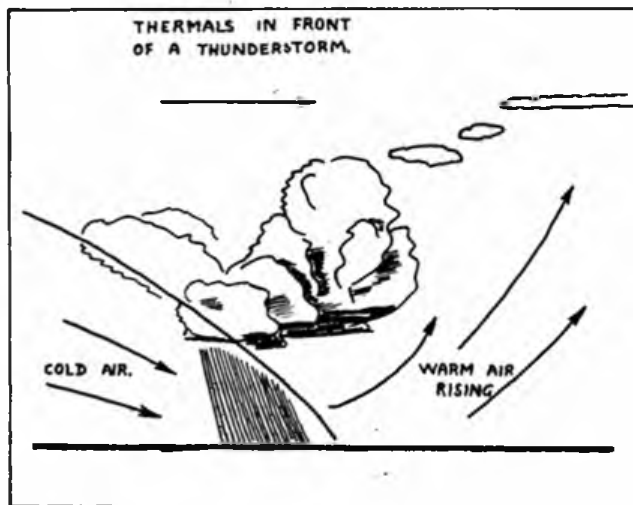


FIG. 5

the thermal to a height of about 2,500 ft., at which altitude a small cumulus cloud was continually forming and then being blown away by a wind which was apparently blowing at that altitude.

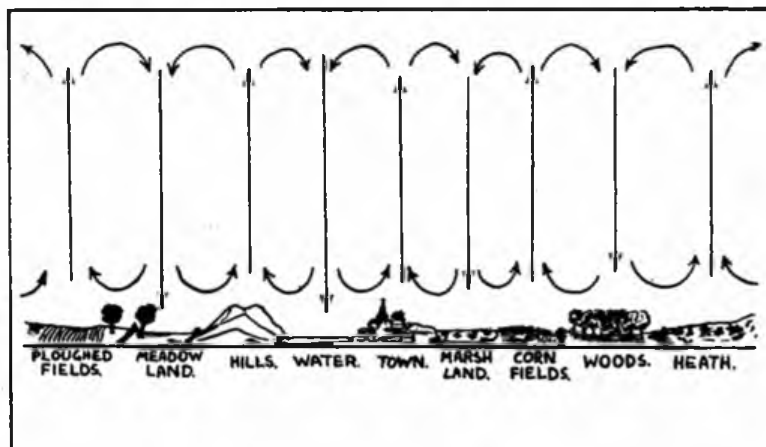
Birds, too, are useful thermal indicators. Seagulls, for instance, far prefer the effortless thermal flying to tiring ornithopter flapping flight. "To fly where the birds fly" is a useful maxim, as long as you don't choose a hedgesparrow as the ideal bird.

A last note concerning the actual flying characteristics of the models themselves. In order to hold a thermal, the model must execute tight circles without falling off in a spin. If it doesn't circle it will plunge right through the thermal and come out of the far side without gaining more than a few feet of height.

The model should preferably have lower forward speed and greater sinking speed, rather than higher forward speed and a flatter glide. The idea behind this is so that the model will have a better chance to "linger" in the thermal.

That means, make your jobs fly as slow as possible, without actually stalling—and so here's to happy landings!

FIG. 4



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Concluded from page 391.

The tubing may be obtained by cutting a short length of rubber-covered wire as used for electrical purposes and taking out the wire centre.

The true solid modellist should always be on the alert for any dodges such as these to save unnecessary labour and improve the appearance of his models, for the variety of odds and ends which can be utilised in model work is really amazing.

Ease of construction, which is the main virtue of the monoplane so far as modelling is concerned, is somewhat counterbalanced by the more careful painting which is necessary nowadays, but even this can be made reasonably simple if a little thought is expended before commencing the brushwork.

DO NOT CONCENTRATE ON WAR

Do not concentrate your thoughts upon war subjects. You will find it very worrying and very bad for the nerves.

Read, write, sketch, paint, study your vocation; anything that will occupy your mind and your time. Make use of your spare time by concentrating upon something useful.

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By becoming efficient in your vocation you can give the best service to your country and to yourself. The more you increase your earning power the better it is for the country and for yourself personally.

War or no war, earning power always brings its possessor to the front. It is no use waiting for better times. The ideal opportunity never arrives. We have to make the best of existing conditions. Therefore, delay is useless; it is worse, it is harmful.

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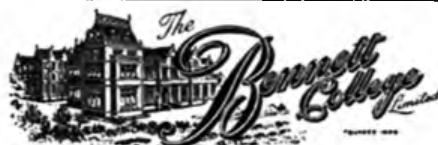
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THERE are three possible variants of the tapered wing: that of constant thickness and taper in plan form only, that of constant chord and taper in thickness only, and that in which the thickness and chord are both variable.

The third form is by far the most common and desirable, and whilst the second type is occasionally used, it is perhaps impossible to find an example of a wing tapering in plan form only, as there can be little point in this arrangement.

There are, however, wings exhibiting singularities of plan and section taper, a striking example being the Westland Lysander, in which both the chord and thickness decrease on either side of a line located at a considerable distance from the wing root. More usually, however, a wing is tapered in plan and section substantially uniformly from the root outwards, and the reason for the unorthodox shape of the Lysander wing is inherently structural rather than aerodynamic.

Taper in both section and plan is certainly beneficial from the viewpoint of structural economy since, in a cantilever wing, the bending moment due to the air load is a maximum at the root, and falls off rapidly towards the tip, and a tapered spar is, therefore, proportioned more in accordance with the loading at every section. Furthermore, in a plan tapered wing, the air load is more concentrated towards the root, as compared with the substantially uniform lift distribution of the rectangular wing, and thus the bending moments are correspondingly reduced.

These effects are of great importance in the case of full scale aircraft, and result in lighter and more rigid structures, but in regard to models their significance is reduced, since the relative strength and stiffness of a model aircraft is high. The effects of taper on performance are of equal interest, however, to both the full scale and model designer.

There is little data relating directly to the aerodynamic effects of section taper, but with regard to taper in plan, an appreciable improvement is apparent, a reduction of drag and a slight increase of lift resulting. As a rough guide, for the ideally tapered wing as compared with the rectangular wing of equivalent aspect ratio, the reduction of total drag is up to 13 per cent, and the increase of maximum lift coefficient from 2 per cent to 10 per cent, according to the basic aerofoil. It will be realised, therefore, that the direct aerodynamic advantages of taper are not very substantial, and that the principal benefits accrue by way of the structural improvements.

It is important to consider plan taper apart from aspect ratio, since the equivalent aspect ratio of a tapered wing is the same as that of the rectangular wing having the same span and area, the root chord being increased in proportion to the taper.

Plan taper, however, may permit greater aspect ratios to be used to advantage, in view of the refinements thereby effected, and thus indirectly the advantages of higher aspect ratio may be added in favour of the employment of non-rectangular plan form.

The aerodynamic benefits of taper are limited, however, and are not progressively reaped by the application of the principle: the more the taper the greater the gain. In fact there is an optimum value which should not be much exceeded, and the consequences of so doing are reflected in a further efficiency loss and a bad effect upon lateral control characteristics.

By NORMAN

In general, a value of the ratio $\frac{\text{tip chord}}{\text{root chord}}$ exceeding one-fifth should never be used, and the best results appear to be obtained with a tip chord of one-half the root.

Although, in fact, there have been examples of wings tapering out to a fine radius at the tip, almost to a point, the aerodynamic efficiency of such a form is far worse than that of the equivalent rectangular wing, and the lateral control characteristics at the stall are likely to be critical to a dangerous degree. These facts are so firmly established that there can be no valid argument in favour of other than moderate taper.

There are two kinds of plan taper, the curved and the straight, and whilst the conclusions drawn from aerodynamic theory favour the elliptical form, there is in practice little to choose between this and the best straight taper with rounded tips.

In any case, and whatever plan form is employed, the shape of the wing tip is not unimportant. By the tip is meant that part of the wing which does not extend, as a maximum, more than one chord length in the direction of the span, and is more commonly limited to half this measure. The best form, as a compromise between aerodynamic and structural requirements, is that known as the double elliptical, and the wing tip of the Hawker Hurricane is an example of the kind.

THE DESIGN OF

The changing sectional shape or scale of a tapered wing introduces design complications, since there can be no two ribs alike, and the section of each rib must therefore be derived individually.

There are two methods of laying out such a wing: by calculation or by a graphical construction. The graphical method, however, except in large scale, leads to confusion and inaccuracy, and the first system is usually preferred.

The plan form of the half wing must first be drawn in full scale and an aerofoil section selected for the basic section.

It should here be noted that it is legitimate to assume that the aerodynamic characteristics of the wing correspond to those of the mean section, and therefore, where the sections are derived by modification of a single aerofoil, the known section may conveniently be used for the rib (hereafter called the reference rib) at the approximate half semi-span position.

This condition may influence the decision regarding a suitable section, since a very thick one will lead to excessive root thickness, or a thin one, on the other hand, to an unduly fine thickness taper, in order to allow sufficient depth for the tip.

There are, however, a number of excellent sections, including most of those modern ones of outstanding merit, entirely suitable, and the choice will depend primarily upon the particular suitability of the aerodynamic characteristics.

Having chosen an aerofoil section for the basic section of the wing, the next step is to mark in the rib centre lines, and note which corresponds to the reference rib.

HALL WARREN

The maximum thickness of this rib is given by the addition, in linear scale, of those two collinear ordinates of the basic section having the superior sum. Most commonly these ordinates are at or near the 30 per cent chord location. With the thickness of the wing defined at this position, the thickness taper should be decided, and the wing elevation be drawn in alongside the plan.

In full scale practice, and from considerations of torsional stiffness and economical strength, a thick root section is desirable, and since the dimensions of the spar at the root are controlled by the bending moment and the root depth, the thickness taper, for constant spar width, will be indicated by the loading conditions. That is to say, for the maximum economy of material, the strength, and therefore the depth, should be proportional to the bending moment at all sections of the wing. In practice, however, other factors have to be considered, and it is not possible to conform precisely to this ruling. Moreover, and in regard to model design, the foregoing considerations have but small influence, and for models, therefore, the thickness taper may be decided more or less arbitrarily.

To continue the lay-out, the projection of the rib centre lines across the elevation measures off the maximum thickness of each rib, and this thickness as a proportion of the thickness of the reference rib, should be marked in the appropriate positions. That is to say, divide the

sections at all span locations are derived, in proportion to the thickness, by the method previously described.

By this method an aerofoil section can be modified to suit any wing, whatever the dimensions may be, and the geometry of the wing is thus independent of the constants of the basic section.

A word of advice. In the case of a straight tapered wing, it is obvious that the work of plotting the several sections can be forwarded, if the chord locations of the ordinates are defined by the intersection of lines joining the corresponding points on the root and tip chords. Further, whatever operation is adopted for the multiplications, "logs.," slide-rule or just "sums," three places should be taken, as this gives accuracy to a hundredth, which part of an inch can easily be scaled.

By the way, with a slide-rule it is particularly quick, since one factor at each step of the work is constant, and the products can therefore be read off in rapid succession.

In conclusion, it is relevant to add a note upon the suitability of particular aerofoil sections for cantilever tapered wings.

The current trend of design, with "cleanness" as the keynote, has had an inevitable influence upon aerofoil research, and by far the majority of modern sections have been developed for the cantilever monoplane.

The thickness of these sections ranges between 11½ per cent and 18 per cent of the chord, but in general, for a mean section, one having a thickness of between 12 per cent and 15 per cent will be preferred.

A group of related sections developed by the American National Advisory Committee for Aeronautics, all of 12 per cent thickness, are of particular interest, and, considered upon a basis of general merit, are outstanding. These aerofoils are: N.A.C.A. Nos. 0012, 2212, 2312, 2412, 4412 and 23012.

This list may be implemented by the addition of the following, which tallies almost all those sections worth consideration, except perhaps for very special purposes. The additions are 2R, 12, N.A.C. 21, N-80 and CYH.

It would be difficult, however, to find a more generally suitable section for all normal purposes than N.A.C.A. 23012, and by almost all criteria this aerofoil represents the pick.

The question may be asked if there are no suitable sections of British origin. There are, of course, but the United States has gained a good start in this line of research, and the majority of modern high performance aerofoils have been developed in that country. Moreover, there is scarcely any aerofoil of British origin which has not its American counterpart.

Aerofoil section data, presented in English, is to be found in the publications of the British Aeronautical Research Committee and the American National Advisory Committee for Aeronautics, but this data is distributed amongst a large number of reports and memoranda, and is not readily or conveniently available.

For this reason, and as a convenient reference, the table of co-ordinates of the profile of aerofoil N.A.C.A. 23012 is appended at foot of page 386.

Should there be any reader who is unfamiliar with the application, let him multiply each tabulated figure by the chord length and divide this product by a hundred. The first column gives points on the datum or chord, from which the upper and lower surface loci are vertically measured. The second and third columns give the loci

(Concluded on page 382).

TAPERED WINGS

thickness of each rib by the thickness of the reference rib, and mark these values against each centre line.

Next, from the table of co-ordinates, plot the basic section about the reference rib centre line, and mark against each ordinate, positive and negative, the linear values.

The sections of all the remaining ribs are now quite simply derived by multiplying for each rib the ordinates of the reference rib by the proportionate thickness figure for the rib considered. These products are the linear ordinates of the rib section.

There is an important alternative method, useful under certain conditions, for deriving the reference section of a tapered wing, based upon a known aerofoil, yet where the wing itself may not contain the basic section.

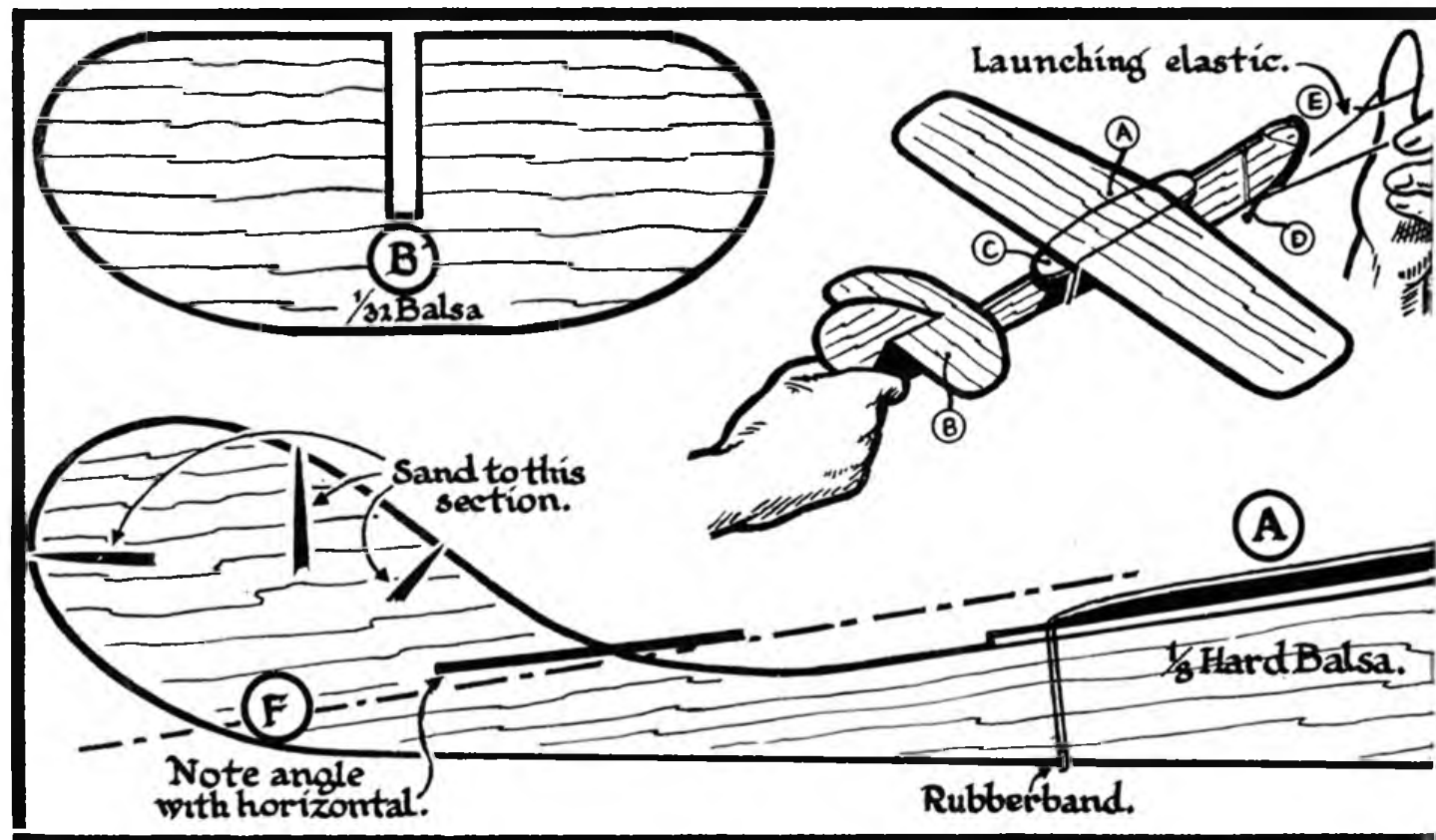
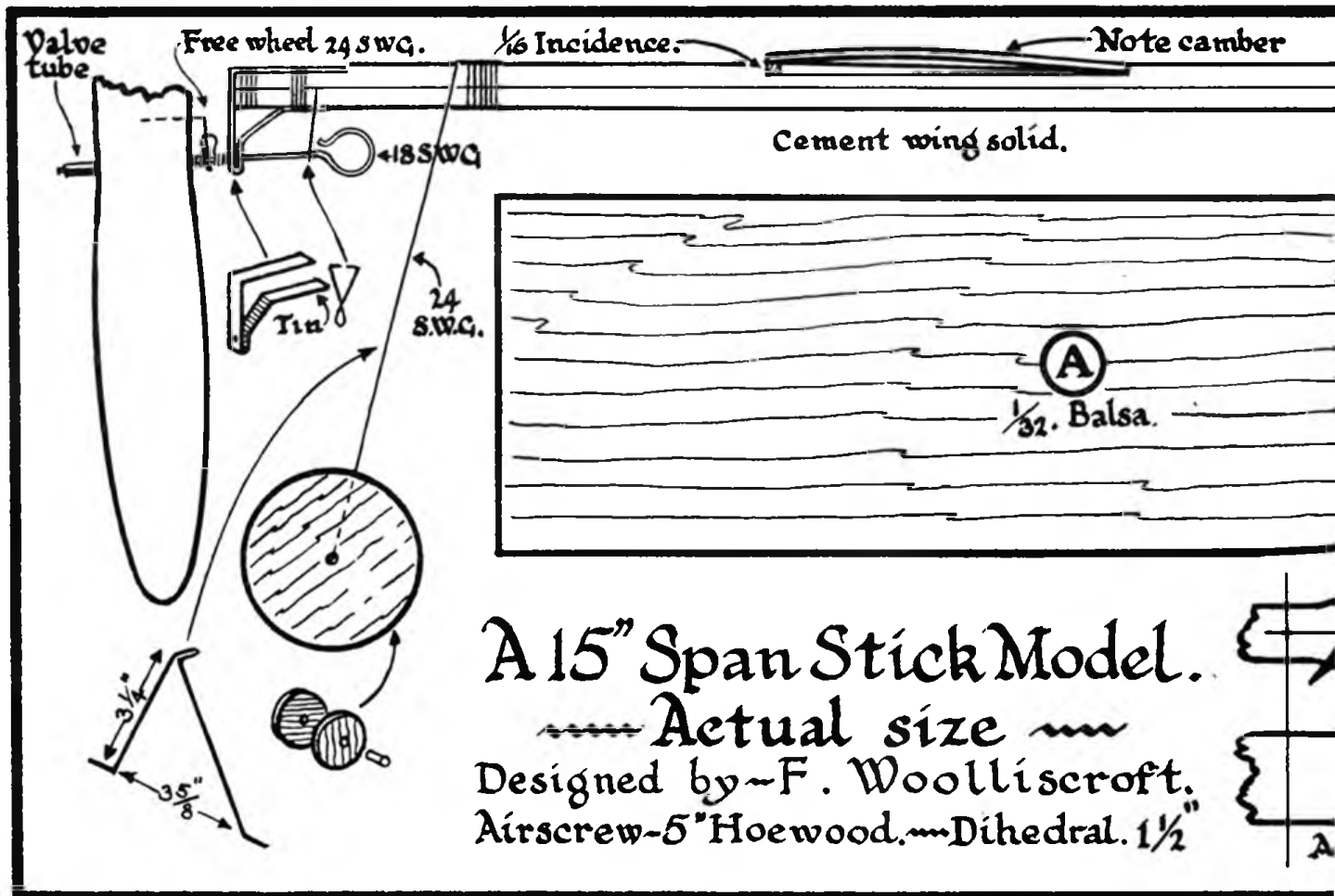
It is clear that, the thickness chord ratio being one of the definitives of an aerofoil section, where there is no identity between any such ratio of the wing and that of the basic section, the wing cannot contain the said section.

In this case, the properties of the mean section are unknown, and the performance of the wing therefore cannot be estimated.

Firstly, lay out the plan of the half wing, and also the elevation with the desired thickness taper; the reference section, which may conveniently be used for the root rib, is now calculated in the following manner.

Divide the thickness per cent of chord of the reference rib, which is defined by the dimensions of the wing at the position selected, by the thickness per cent of chord.

Now multiply the ordinates of the basic section by the quotient so found, which gives the ordinates per cent for the reference rib. Plot the reference section, and the





AFTER having received reports of motors breaking in America from two of the members of last year's English Wakefield Cup team, and having had experience of this unfortunate occurrence himself, the writer has recently made many tests on rubber. The theory of the action of sunlight on rubber put forward by John Zaic, and mentioned by "Clubman" in the February, 1940, issue of *THE AERO-MODELLER*, has also opened up a very interesting field of investigation.

All the tests concerning the action of light were made in February and early March, and, natural sunlight being conspicuous by its absence (you're telling me!), the services of a Fugitometer were called in. The Fugitometer is a fading machine which is widely used in the laboratories of textile and other concerns for testing the fastness to light of dyed fabrics and other articles. The beauty of the machine is that the fading is accelerated, the degree of fading of specimens which have been exposed in the machine for sixty hours being similar to that obtained by exposure out of doors for about three weeks in summer. The intensity of the light on the

Above are three enlargements—all to the same magnification—of rubber. On left is rubber subjected to ultra-violet light; in centre is good rubber; and on right is rubber which had been soaked in oil!

specimens is about one-and-a-quarter that of noon summer sunlight. Another advantage is that results are consistent, and can readily be repeated. The machine consists essentially of an arc lamp, burning half-inch diameter carbons, round which are sixteen compartments, each with a Vitaglass front. Vitaglass transmits ultra-violet light, of which more anon. The compartments are all air-conditioned, and any desired temperature and humidity may be attained and maintained in them by adjusting the controls. During all these tests the temperature was 85°—95° F., and the relative humidity was 88 per cent. (If you are thinking of buying a Fugitometer, the price is about £180!)

Various preliminary tests had been made with the help of the Fugitometer, when it occurred to me that perhaps ultra-violet light had some effect on rubber, as the light emitted by the arc lamp is particularly rich in ultra-violet light. Now ordinary window glass does not transmit ultra-violet light, and so a length of rubber was wound round a piece of window glass and placed in a compartment of the Fugitometer so that the rubber in front of the glass, i.e. next to the Vitaglass window, would receive ultra-violet light, and that behind the window glass would not. The rubber was exposed for a period of seven-and-a-half hours, which, if my arithmetic is correct, corresponds to slightly less than three days' exposure out of doors. The rubber was cut into short

lengths, lubricated, and, after two hours, wound till it broke on a textile yarn twist testing machine.

As a standard it was taken that fresh, untreated rubber which had been lubricated for two hours, been pre-wound to 75 per cent and 90 per cent of full turns, and then wound until breakage occurred, had a "turns value" of 100 per cent.

This is where the fun starts. The rubber which had received a share of ultra-violet light would only take 49 per cent turns before breaking, and that which had received no ultra-violet light could stand 56 per cent full turns. The rubber was found to have acquired a glazed surface (on that side which had faced the light), and to have a peculiar "dead" feeling when handled. If you put a strip of rubber on the table and run your fingers along it, your fingers will not slide, as the rubber grips them, but they will slide quite easily on "faded" rubber. The rubber was inspected through a microscope in a slightly stretched condition (the rubber was stretched, not the microscope!), and it was seen that the glazed surface had cracked badly, and that the edges of the

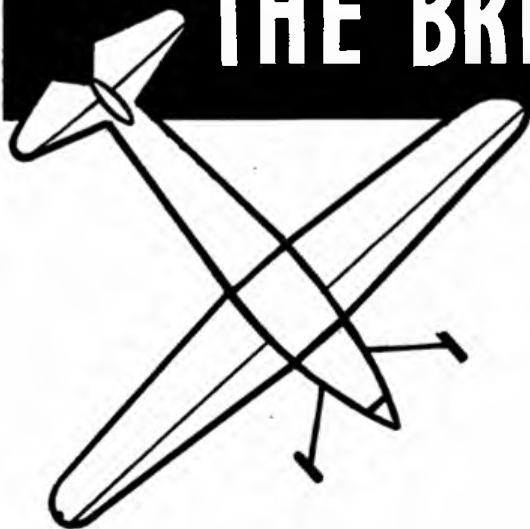
cracks were uncomfortably sharp and rough. So, when this rubber was wound, not only was part of it lost through being turned into a non-elastic glaze, but the edges of this glaze were rubbed against the tightly stretched rubber, with unfortunate results. After this rather frightening discovery, another test was made: a length of rubber being exposed in the Fugitometer for the equivalent exposure of one hour's noon summer sunlight, and on testing, 85 per cent turns were obtained. This is serious, this losing of 15 per cent turns after exposure to only one hour's good sunlight. In ordinary flying, when it is not often that the turns given to a motor exceed 75 per cent or so of the maximum, a motor exposed like this would probably not break, but in a competition, where the last few turns often mean so much, the result would be rather different.

Rubber should be kept cool, as mentioned by Mr. Maxwell, of the Glasgow M.A.C., in the March issue of *THE AERO-MODELLER*. Incidentally, isn't it curious how the Scotch go to a good deal of trouble to find out how to make their rubber go a long way? Even to wiping off moisture with a trowel (*sic*). (Sorry—that was a typesetting error—towel is the missing word.—ED.) The effect of heat was found by testing a length of rubber which had been kept in a hot-air drying cupboard for forty-eight hours, in the dark at a temperature of 140° F.

(Continued on page 386).

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THE DETERIORATION OF RUBBER.—Continued.

86 per cent turns were obtained before breakage occurred. This temperature is rather high, but similar results can be obtained by employing a lower temperature for a longer period. I have noticed that in the lab. where I spend my days earning an honest (more or less) living, the rubber tube carrying cold water to a condenser is always in better condition than the tube leading tepid water from it; this after several months of use. The time factor seems to be the most important thing where heat is concerned.

So much for the effect of heat. And now for a word or two about oil. It is well known that oil is no friend of rubber, but only a few weeks ago I met a newcomer to the art of aero-modelling who, having heard that the number of turns which could be wound on a motor could be greatly increased by lubrication, soaked his rubber in oil of the Castrol XL type! I will not repeat here what he said when he wound up his motor next time, but he was generally discouraged. A length of $\frac{3}{8}$ in. flat rubber was immersed in a light mineral oil of the sewing machine oil type, and left for five days. On inspection it was found that the strip had increased in width to greater than $\frac{3}{8}$ in., and correspondingly in thickness. It had become quite translucent, and could be cut very easily, like cheese. Out of curiosity, the breaking point was found, and turned out to be 11 per cent, using oil as lubricant. The moral is obvious. Oil your thrust bearings, by all means, but not too generously, so that the excess oil runs down the propeller shaft on to the motor. It is difficult to remove mineral oil completely from rubber, even with soap and water. On no account use petrol or other solvent for this purpose.

Now for John Zaic's theory of the sunlight turning the sulphur in rubber into sulphur dioxide and then into sulphurous acid with the moisture in the air: I have already shown that sunlight has a deleterious effect on rubber, and so it remains to show whether or not sulphurous acid is formed, and if it is, whether or not it has any effect on the rubber. To determine this, several strips of rubber were suspended in a large corked test

tube and exposed in the Fugitometer for the equivalent of two-and-a-half days' exposure. There was a little water in the bottom of the tube to provide the necessary moisture. On removal, the rubber was rinsed with distilled water, and the washings collected and added to the original volume of water. A little hydrogen peroxide was added to oxidise any sulphurous acid to sulphuric, and then barium chloride solution, when a very slight precipitate of barium sulphate appeared. This was filtered off and weighed, and the weight of sulphur in the sulphate calculated, and found to be 0.087 per cent on the weight of the rubber exposed. This is about one part in 1150. Next, a length of rubber was immersed in concentrated sulphurous acid for one week. When tested, 83 per cent turns were obtained. 91 per cent turns could be wound on rubber which had been immersed in water for the same time. So, sulphurous acid is formed, but only in very small quantities, and even concentrated acid has only a comparatively small effect on the rubber. It should be noted, however, that when the rubber was exposed to light the sulphurous acid was produced by decomposition of the rubber, which was not so when the rubber was soaked in acid.

Other tests show that rubber which has been lubricated for twenty-four hours will take 19 per cent more turns than similar rubber which has only been lubricated for ten minutes before being wound, and also that many more extra turns are obtained by prewinding to 75 per cent and 90 per cent of full turns, and by stretching the rubber while winding. Only about 60 per cent of full turns can be wound on an unlubricated motor, and the rubber has a very ragged appearance after two or three windings. It is surprising how lubricant is soaked up when the motor has been wound several times, and it pays to be generous with it; but do not be too generous, or the excess will be sprayed on to the fuselage when the motor is running. This will weaken the fuselage.

A curious property of rubber is that of contracting when heated. This property will cause excessive strain in a motor which is almost fully wound, and is probably a partial cause of rubber breakages in hot weather.

(Concluded from page 377).

Distance from leading edge— % of chord.	Upper surface— % of chord.	Lower surface— % of chord.
0	—	0
1.25	2.67	- 1.23
2.5	3.61	- 1.71
5.0	4.91	- 2.26
7.5	5.80	- 2.61
10.0	6.43	- 2.92
15.0	7.14	- 3.50
20.0	7.50	- 3.97
25.0	7.60	- 4.28
30.0	7.55	- 4.46
40.0	7.14	- 4.48
50.0	6.41	- 4.17
60.0	5.47	- 3.67
70.0	4.36	- 3.00
80.0	3.08	- 2.16
90.0	1.68	- 1.23
95.0	0.92	- 0.70
100.0	—	0

Leading edge radius = 1.68% of chord.

of the upper and lower surface respectively for each chord position.

It will be seen that this standard method of presentation, in units per cent of chord, is convenient in that it is directly applicable to any chord length.

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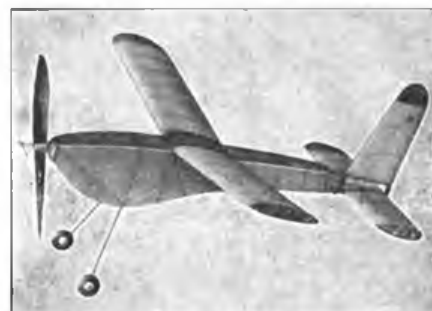
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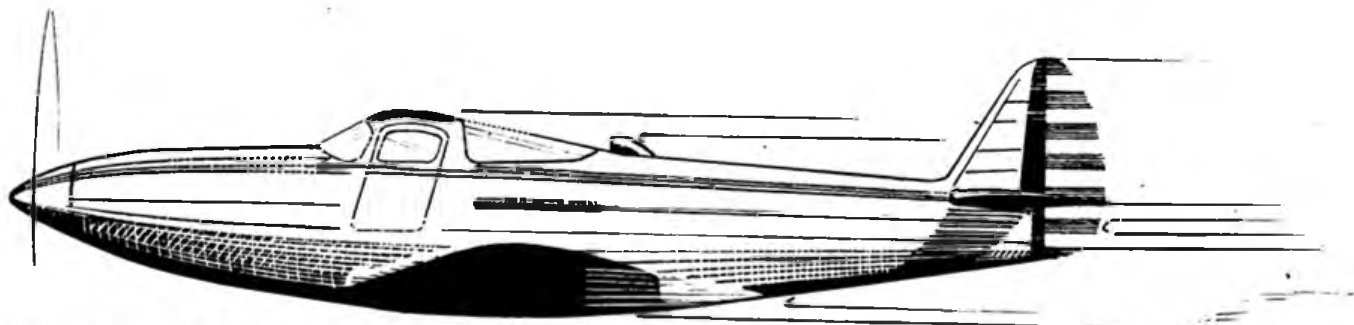
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DESIGNS FOR THE SCALE MODEL BUILDER—VI



By **PETER GARROD CHINN**

— The AIRACOBRA —

HIGH-WING warplanes are rather rare nowadays. Low-wing and mid-wing fighters and bombers are "all the rage," and even trainers are all going low-winged. However, there is one type of military 'plane that seems to have survived—the short-range reconnaissance, observation or army co-operation machine. The idea of sticking to the high-wing here is, of course, that there is no wing to obstruct the observer's vision in a downward direction. High-wing scale models generally give a better performance, so I have picked out a couple of observation machines to describe this month, one British and one German—the Westland "Lysander" army-co-operation monoplane, a favourite with model builders, and the Henschel Hs.126. Similar in lay-out, both aircraft are high-wing, strut-braced, radial-motor, spatted-underside monoplanes. Another 'plane which may be included in this category is the older American Douglas observation parasol monoplane, now being replaced by the North American O.47 mid-wing cantilever monoplane, which has a panel in the bottom of the deep fuselage for photographic purposes (Query: Is this the cue for a departure from the high-wing for observation 'planes?). However, I am wandering from my subject. We'll deal with the "Lysander" first.

The structure of the machine is mainly of metal. The fuselage is built up of steel and alloy tubing, with wooden stringers and fabric covering. The wings, fitted with Handley-Page slots and flaps, have a metal framework and are mainly fabric-covered. They are detachable at the root, the cabane being built integrally with the fuselage. The cantilever tail-plane is placed low on the fuselage and its incidence angle is adjustable from the cockpit. The fin and stabiliser are metal-skinned, whilst rudder and elevators are fabric covered. The fixed undercarriage employs Dowty internally-sprung wheels enclosed in large spats, which also house landing lamps and mountings for one machine-gun. Ammunition for these guns is fed through the leg fairings from the fuselage. A fitting is placed on each landing gear leg, just above the wheel spats, to take a small stub-wing. These stub-wings can take bombs, extra fuel tanks, parachute flares or containers. Other equipment includes a retractable message-hook along the bottom of the fuselage, two oxygen bottles for pilot and gunner (who is provided with one flexibly mounted machine-gun), two parachute flares and radio installation.

The "Lysander" is powered by either one 890 h.p. Bristol "Mercury" ("Lysander I") or one Bristol "Perseus" of 905 h.p. ("Lysander II"), driving a triple-blade controllable-pitch airscrew. Ninety-five gallons of fuel are carried, which gives the machine a normal range of 600 miles at 150 m.p.h. Top speed is 229 m.p.h. at 10,000 feet. Climb to 20,000 feet takes approximately 19.5 minutes, initial rate of climb being 1,650 f.p.m. Service ceiling is 26,000 feet. Gross weight is about 6,000 lb., giving a wing-loading of over 23 lb. per sq. ft., yet in spite of this the landing speed is only 55 m.p.h. with slots and flaps open.

Dimensions of the "Lysander" are as follow: Span 50 ft., maximum chord 6 ft. 8 in., chord at root 5 ft. 3 in., overall length 30 ft. 6 in., span of tail-plane 12 ft. 6 in., and height 14 ft. 6 in. Wing area is 260 sq. ft., stabiliser and elevator area 58.3 sq. ft., fin and rudder area 25.5 sq. ft.

The "Lysander" is one of the best R.A.F. designs to choose for a flying scale model, and I hope to give a cut-away drawing of such a model shortly.

The German Henschel Hs.126 is very similar, in general, to the "Lysander." However, it is older, and, unlike the British machine, is no longer in production. The whole machine is of metal; fuselage, wings and tail units (except for control surfaces, which are fabric-covered) are all metal-skinned. The wing is connected to the fuselage by means of steel cabane struts, and is braced by vee-struts. Landing lights are fitted in the leading edge, and a radio mast is fixed above the centre-section of the wing. The tail-plane, unlike that of the "Lysander," is strut-braced and is placed high on the fin. Its angle of incidence is not adjustable, trim-tabs being fitted to the elevators. A transparent canopy covers the cockpit as far as the back of the pilot's seat. Glass wind-deflectors are fitted to the rear of this cover to protect the gunner (who operates a 7.7 mm. machine-gun on a flexible mounting) from slipstream. Another 7.7 mm. gun, fixed to fire forward through the airscrew, is mounted on the top of the fuselage under the centre-section. The undercarriage is well faired, the wheels being enclosed in spats and fitted with hydraulic brakes.

Power is supplied by one B.M.W. 132Dc nine-cylinder air-cooled radial motor. This unit has a rating of 870 h.p., and was developed from the well-known American

Pratt & Whitney "Hornet." It is enclosed in a well-shaped cowling and drives a V.D.M. three-blade metal c.p. propeller. One hundred and twenty gallons of fuel are carried in one tank situated beneath the pilot's feet. Normal equipment includes: oxygen bottles, radio, Verey pistol, etc.; for bombing duties, ten 22 lb. bombs, and a camera for photographic duties.

Performance figures are given as follow: Maximum speed 220 m.p.h. at 10,000 feet, cruising speed 186 m.p.h., landing speed 60 m.p.h., time taken to climb to 20,000 feet approximately 13 minutes, service ceiling 28,000 feet, and range 680 miles.

Wing-span of the Henschel Hs.126 is 47 ft. 7 in., overall length is 35 ft. 7 in., height 12 ft. 4 in., and wing area 340 sq. ft. Gross weight is 6,800 lb., giving a wing-loading of 20 lb. per sq. ft.

This design should make quite a good flying model. The wing area is substantially greater, and tail-moment longer, than the "Lysander's," and the length of the undercarriage should allow a good size propeller to be used. Built to a scale of, say, $\frac{3}{4}$ in. to 1 ft., this design should make an attractive model, capable of long flights. Plans and photos of both these 'planes are given in Mr. Pollitt's book, "Scale Plans of Military Aircraft."

New military 'planes are appearing every month or so in the United States, and one of the recent types ordered for the U.S. Army Air Corps is the Bell P.39, or "Airacobra" fighter. This machine, which first appeared about a year ago, has been described as an "interceptor-pursuit," which evidently means that it combines the climbing powers of an interceptor with the range of the pursuit 'plane. According to the U.S. Army Air Corps, it has a maximum speed in excess of

400 miles per hour, a range of over 1,000 miles, and a cruising speed of about 325 m.p.h. No indication as to climbing powers is given, but ceiling is quoted as being over 36,000 feet.

The "Airacobra" is a flush-riveted all-metal cantilever low-wing monoplane, beautifully streamlined. Like the twin-engine Lockheed P.38 (also in production for the U.S. Army), the P.39 has a tricycle undercarriage and is powered by an Allison V-12 liquid-cooled motor having an output of 1,250 h.p. This motor is mounted amidships and drives a Curtiss triple-blade metal c.p. airscrew through an extension shaft. Placing the motor in this position should give the machine exceptional manoeuvrability. Another interesting point about the "Airacobra" is the heavy shell-gun carried in the nose to fire through the propeller spinner. This weapon has a bore of nearly $1\frac{1}{2}$ inches (37 mm.), and fires heavy explosive shells at a high velocity. Its effective range is very much greater than that of other types of aircraft guns. Four high-speed Brownings are also mounted in the nose, these being synchronised to fire through the airscrew. The pilot's cockpit has a fixed transparent cover, which permits good vision all round. No sliding or hinged portion is provided, entrance to, and exit from, the cockpit is effected through a car type door in the fuselage just above the leading edge of the wing.

The invasion of Norway and Denmark by the Nazis has prompted the U.S. Government to release the "Airacobra" for export to the Allies (permission having previously been reported as refused), together with the 400 m.p.h. plus Lockheed twin-engine fighter and other "secret list" warplanes, including a new Douglas recently stated in the Press to be the fastest bomber in the

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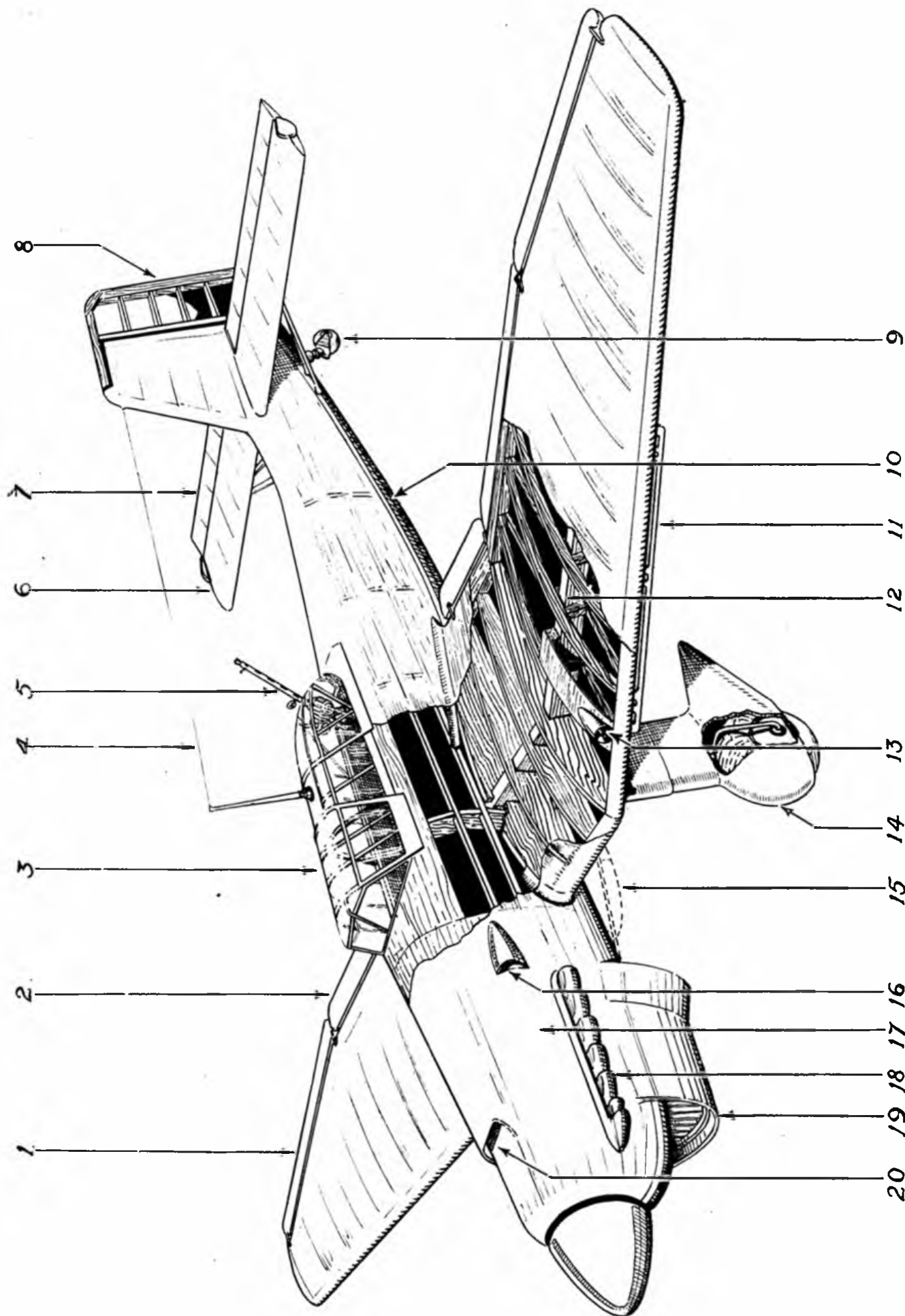
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 12. Box type wing-appe.
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 18. Ejector type exhaust manifolds.
 19. Dummy radiator and cowl.
 20. Dummy air-intake to oil-cooler.
- * Optional—see text.

world. However, the chances of the Bell being delivered in large quantities, even if ordered, are for the moment rather small.

By the way, the Brewster fighter (March issue, *THE AERO-MODELLER*) has been ordered for the Finnish Air Force (and probably will be in service by the time this appears in print). The same machine has also been ordered for the Belgian Army Air Corps. The production type seems to be better streamlined than the prototype. A better cowling and a large spinner cuts down the frontal area of the nose and makes for better appearance. Reports are still current that Brewsters have been ordered for the R.A.F. at a cost of about nine million dollars, but no official statement has so far been issued confirming this.

The Junkers Ju.87, briefly described in the Christmas issue, has been chosen as the design for this month's cut-away model drawing. The model shown is of the latest version—the Ju.87B. This machine uses the Junkers "Jumo 211" motor of 1,200 h.p. in place of the "Jumo 210" of 640 h.p., and has a spatted undercarriage instead of the "trouser" type used on the original Ju.87. Various other details distinguish it from the earlier type, such as the larger radiator (the "Jumo" is water-cooled), a single radio mast in place of the twin masts formerly used, and sliding cockpit covers to replace the hinged type hoods. The diving brakes which were fitted to the Ju.87 are also used on the Ju.87B. The fitting of diving brakes on the Junkers was criticised by certain aviation writers, because it was considered the terminal velocity of the machine (about 400 m.p.h.) was not great enough to justify their use. (Diving brakes are used to restrict diving speed on fast dive-bombers, in order to permit greater accuracy when bombing). One or two writers expressed the opinion that the brakes were fitted mainly because the Ju.87 was not capable of standing up to pull-outs and manoeuvres from fast dives. However, there is no real reason to suspect that the Ju.87 is structurally weak. There has been no evidence of Ju.87's wings oscillating or breaking up in mid-air, as have been reported of other German designs, notably the Messerschmitt Me.109.

The Ju.87B has a maximum speed of 240 m.p.h., and

a cruising speed of 200 m.p.h. Range is about 500 miles, and service ceiling 28,000 feet. Main dimensions are as follow: Wing-span 45 ft. 4 in., overall length 35 ft. 6 in., height 12 ft. 4 in., and wing area 344 sq. ft. Gross weight is 9,300 lb., giving a wing-loading of just over 27 lb. per sq. ft.

This machine is not ideally suited to flying model reproduction, the inverted deeply-gulled wings, the large underslung radiator and the spatted undercarriage will place our old enemy "drag" is rather a low position, but if the wing loading is kept low, the effect of a low centre of drag will not be so bad.

It is always an advantage to have a low wing-loading on models that are not entirely satisfactory in general lay-out, as lower power can then be used, which will not easily affect the model's performance. Most of you, no doubt, have had this experience when flying an incorrectly designed model. It may be just the slightest mistake, too much fin area, for instance, there is no indication of the defect until the turns are piled on. Maybe on three-quarter turns the model seems O.K.; just those few extra turns and—whee!—one of those horrible spiral dives.

Fortunately, with a model of the Ju.87 we are not likely to be faced with the problems of a high-powered model, because, with its generous wing-area, wing-loading can be kept low. A scale of $\frac{1}{2}$ in. to 1 ft. will give us a model of just over 22½ in. span, with a wing area of nearly 90 sq. in. It should be possible to keep the weight of a model built to this scale below 2 oz., permitting a wing-loading of under 3 oz. per sq. ft. A larger model, say, $\frac{3}{4}$ in. to 1 ft., could have a substantially lower loading. The drawing shows how the general structural design might appear of a model built to either of these scales. Various details are shown, which would, of course, only be added to an ultra-detailed model, from which only limited performance was required. These details are noted with an asterisk in the drawing key. The Junkers "double-wing" flaps and ailerons are not marked as optional, since these are two of the most distinguishing features of the Ju.87 and should be fitted to all models that are intended to be fairly authentic. They need not be movable, but merely thin strips of balsa attached at a short distance from the trailing edge.

FOLDING PROPELLERS By G. W. DAY

FOLDING propellers have come to stay. Their success at the Wakefields have disproved the idea that are "just another gadget." Like many other outstanding ideas now commonly used in the hobby, the Americans are responsible for their introduction.

Way back in 1935 Bob Cahill (brother of Wakefield winner Jim) flew a job at the Nationals which featured a folding propeller. The glide was not steady, because the propeller had no stop to hold it still. The brothers were not put off by that, however, for the 1937 Nationals saw Jim fly his sensational streamlined "Clodhopper" to top place in the Moffett international event. Flying the same model the following year, he created model history by winning first place on the American Wakefield team, and clinched the matter by bagging the trophy in France a few days later. This year Dick Korda successfully defended the trophy and chalked up a new world's record into the bargain, with a model using a one-bladed folding propeller.

These successes prove that the Yankees "have something," and bear out the theory that a hinged propeller not only allows the propeller itself to offer less drag during the glide, but allows the wing to work in comparatively "clean" air. These points allow a model so equipped to out-glide even the most highly "streamlined" models using the conventional free-wheeler.

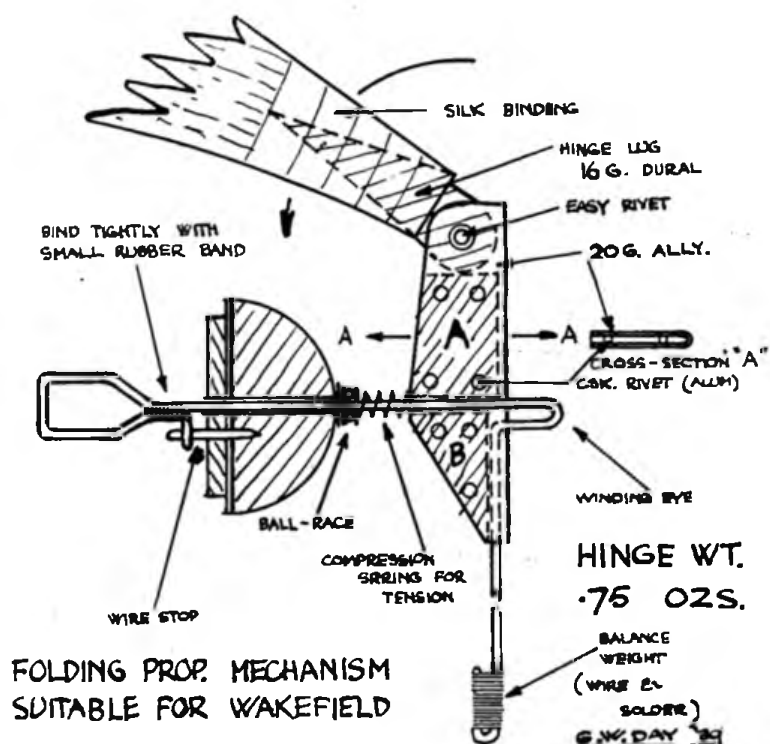
If you still doubt the merits of a folding propeller, rake out that old Wakefield model you discarded after the Trials, and give it a few hand glides. Now remove the propeller from its normal position and bind it lengthwise alongside the nose of the fuselage with a rubber band. Now try.

Well, now that you are determined to use a hinged propeller next season, study the accompanying drawing. This hinge is the fifth model made and used during the past two seasons. It is simple, light and ultra-strong. During power flight the screwing action of the blade or blades, helped by centrifugal force, keeps the propeller

extended. After all useful turns have been used, the spring allows the stops to engage, which prevents the shaft from turning. The slipstream now sweeps the blade where it will cause the least resistance. By adjustment of the peg cemented into the rear of the nose-plug, the blade or blades will always flop back into the same position (in the author's experience the blade fits snugly along the side of the ship). Be sure to have the pivot a sufficient distance away from the shaft to allow the blade to lie parallel to the airstream. If you use a single-blader (which has been proved to be at least as effective as the more conventional type) cut down weight by using a long wire to support the counterweight.

While the drawing is almost self-explanatory, perhaps it should be explained that the idea is that the propeller shaft (16 g. wire), with the packing pieces "A" and "B" (16 g. ally), are sandwiched between a piece of 20 g. ally, which is folded along the front edge of the hinge. "A" should be riveted in place first. Then the shaft should be installed by filing a slot in the folded edge of the hinge, to allow the winding eye to protrude. The shaft is firmly fixed by riveting "B" in place.

The pivoting lug should be made of duralumin if possible. Note the shoulder which holds the blade rigid whilst under power. A rough outline with a lightening hole or two (if duralumin is used) will facilitate its being cemented to the blade. Silk binding should finish off a good strong job.



The little extra weight used in the hinge may be compensated by using lighter blades, since they do not have to receive the shock of hard landings. Who knows, we may even see built-up blades in the near future?

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By

H. McDOUGALL

Here is shown the Hawker "Hotspur" . . . the "experts" say the gun turret is power controlled.



SOLID scale modelling is a hobby which has survived a great change during the past few years. It seems only a short time ago since nearly every Service aircraft one saw was a biplane, but nowadays biplanes are becoming more and more rare, particularly in the R.A.F.

There are many who will regret the passing of the old strut-and-wire biplane, for, accurately scaled down, it usually made an excellent model. This change-over from biplane to monoplane has affected the hobby very greatly.

SOLID SCALE MODEL MONOPLANES

In past-years it was usual to spend many weeks on each model before it was ready for painting. The multitude of small struts, which required such delicate placing with tweezers, and the assembly of complicated under-carriages, were tests for any enthusiast's patience. One wonders how many builders were able to accomplish these difficult tasks at the first attempt.

In the years during and immediately after the Great War most solid modellers were lone hands, and yet, without being able to benefit by other builders' experience as the introduction of THE AERO-MODELLER has enabled us to do, they turned out some really fine examples of craftsmanship.

The writer has recollections of a beautiful solid scale model made by his father during the Great War when he was serving in the old R.F.C. The model was of that most imposing machine the Handley-Page O/400, which for sheer constructional complication is unsurpassed by any modern aeroplane.

However, for we who are of the so-called younger generation, solid scale modelling is a somewhat simpler matter, at least so far as actual construction is concerned. One can turn out a model of, say, the Spitfire or Hurri-

cane in a quarter of the time which used to be spent on a Sopwith Camel.

Will the biplane return? If the performance of the Spitfires so far is any guide, this is not likely. The fighter biplane, which received its last lease of life in that excellent machine the Gloster Gladiator, is now giving way reluctantly, but completely, to its monoplane descendants. Probably the only sphere where the added lifting power of the two wings will justify the resistance they set up is for aircraft-carrier work, as with the new Fairey "Albacore," a biplane torpedo-spotter-reconnaissance machine.

Having decided, therefore, that we must in future



The Blackburn "Skua" Fleet Air Arm dive-bomber fighter.

give our attention almost exclusively to monoplanes, let us take some representative types and see how well they lend themselves to modelling.

Omitting the Hurricane and Spitfire, which are too well-known and simple in outline to require comment here, there is the Blackburn "Skua," a dive-bomber-fighter which operates mainly from aircraft-carriers. This excellent all-round machine has already done valuable work in the Fleet Air Arm in combating the submarines, and H.M.S. "Ark Royal" was one of the first carriers to be issued with this type.



On left is shown the Boulton Paul "Defiant" two-seater fighter . . . with another power-driven gun turret: On the right is a photo of the production type Miles "Master" advanced trainer.

To the solid scale modeller the Skua is quite an interesting machine. The arrangement of the tail has that slightly unorthodox appearance which makes a model look a little different from the more normal types, and the cabin structure and radial engine give a certain amount of scope for the craftsman to exercise his ability. The engine is, incidentally, a Bristol "Perseus" of the sleeve-valve type described recently in THE AERO-MODELLER.

No particular difficulties present themselves in building a miniature of this machine. The undercarriage is somewhat ungainly in appearance, and the model should therefore be built with it retracted in the flying position, which, of course, also simplifies construction. The wing fillets are very long, extending almost to the fin position, and may prove troublesome to make in plastic wood; but, as we will see later, there is a method of surmounting this difficulty.

The Miles "Magister," which is an interesting example of modern elementary trainer design, is being

built in quantity by the well-known firm of Phillips & Powis.

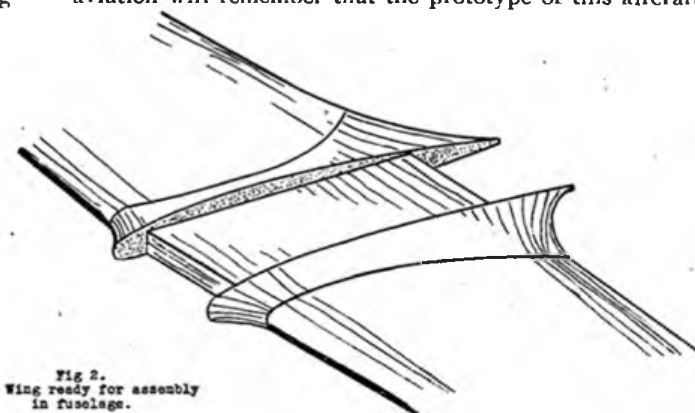
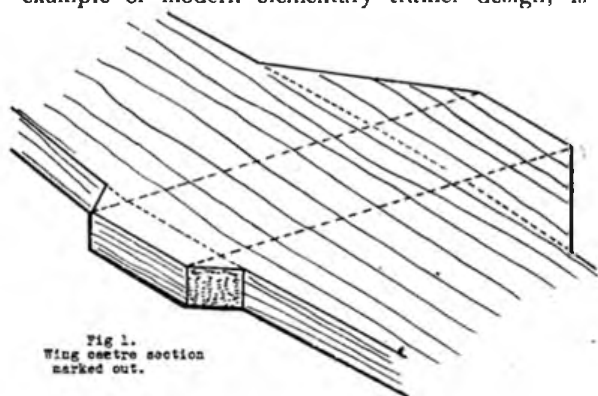
As the Magister has been described previously in this journal, it is not necessary to discuss its adaptability to modelling here, except to mention one detail which is very obvious with this machine.

The writer once constructed a small model, using a rather inadequate general arrangement drawing and depending mainly upon photographs of the actual machine in flight to fill in minor details. When the model was completed it had a peculiar odd appearance. The reason

for this was not traced until the measurements of the model were checked with more accurate plans obtained later, when the reason for the distortion became apparent. The photographs which had been used as a guide showed the machine in flight, that is, with the shock-absorbers of the undercarriage extended to their full length, whereas the finished model had not been suspended as if in flight but placed on a baseboard.

Before consulting any photographs of a machine with a fixed undercarriage one should decide first of all whether the model is to be placed on its own wheels or mounted as if in flight, for if it is to be placed on a solid base the undercarriage must be short, as it is on the original machine when the shock-absorbers are compressed. This effect is particularly noticeable in photographs of the Magister when on the ground as compared with photographs of the machine in flight.

The production type Miles "Master" advanced trainer is now appearing in quantity. Followers of aviation will remember that the prototype of this aircraft,



which was then called the Miles "Kestrel Trainer," created quite a stir when it first appeared. It was originally designed to make use of the surplus stocks of Rolls-Royce Kestrel engines which had been rendered obsolete so far as first-line machines were concerned by the introduction of the more powerful Merlin.

The writer had the good fortune to see the prototype performing soon after its first appearance, and was left with the conviction that the designation of "trainer" was a definite misnomer, and that if the need arose it would be able to acquit itself quite well as a fighter or reconnaissance machine.

The production model has a rather more business-like but less graceful appearance than the prototype, for the demands of Service equipment made the deepening of the rear part of the fuselage necessary, and also the extra cabin supports which have been added have rather spoiled the graceful appearance which the Plexiglass cabin gave. Nevertheless, the unusual wing shape gives the machine a good appearance when the undercarriage is retracted.

The break in the wing is rather severe, and this component would be best carved from a very thick piece of balsa rather than any attempt being made to crack it in the desired places.

Two excellent low-wing monoplanes which have made their appearance—in this case, two-seat fighters—are the Hawker "Hotspur" and the Boulton Paul "Defiant." Data on these machines is very difficult to obtain, and such performance figures as have been published are pure speculation.

Fig 3.
Smokers pipe.

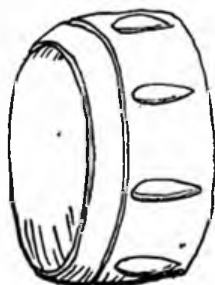
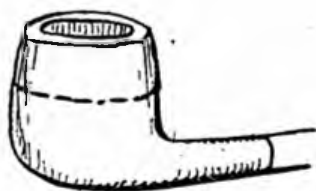


Fig 4.
Finished Cowling.

They are similar in appearance and quite interesting in so far as the rotatable gun turrets which they use are somewhat out of the ordinary. The construction of miniatures of these 'planes is fairly straightforward, and as the undercarriages, when extended, are not too ungainly, a shelf model is quite feasible.

It is not necessary for the writer to describe in detail how to build each of these models, but there are one or two minor details which may require solving. One is the making of the long fillets which one sees on the wings



of modern aircraft. They are not always perfectly satisfactory when made by adding plastic wood after the model has been completed, and a much better plan is to make the fillets integral with the wing.

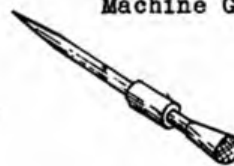
The wood used for the wing should be very thick. After the outline shape has been cut, the centre portion may be marked out as shown in Fig. 1. The wing having been thinned down to the required shape, with the fillets incorporated, the centre portion can be removed, Fig. 2, leaving just sufficient wood to fit into a corresponding slot cut in the fuselage.

A certain amount of accuracy is necessary to make the fillets fit flush against the side of the fuselage, but the appearance of the finished model is much enhanced.

Another problem is the making of cowlings for small models, and this is one which has puzzled the writer for a long time. In one model, made some years ago, of an American Curtis Goshawk, the metal band from the top of a Bovril bottle proved to be just the right size, but for the longer type of cowling which one has to make nowadays these are unsuitable.

One excellent method is to obtain an old pipe and cut the top away (Fig. 3). This may then be finished with sandpaper. The one shown in Fig. 4 is of a type used for a model of the Gladiator, and tiny wooden "bulges" were added round the sides as on the original. The notch running round the forward end was made with a carpenter's marking gauge.

Fig 5.
Machine Gun.



The wood of which pipes are made is very hard and has an excellent surface for painting.

One other problem which is likely to recur very often is the modelling of tiny machine-guns

of the fixed type as used on modern fighters. For most models they are too small to be realistically reproduced from scraps of wood. The solution is provided by using cone-headed nails, which may be purchased very cheaply, and are normally used in fretwork.

On guns of this type the barrel thickens out just aft of the muzzle, and this may be easily imitated by pushing a short piece of rubber tubing along the nail and the gun is then ready to be pushed into place on the model.

(Concluded on page 374).



AIR DEFENCE CADET CORPS NOTES

By DUTY PILOT

*A 7 ft. petrol model built by J. D. Gates,
of No. 40 (Maidstone) Squadron.*

OF our 200 squadrons only eight have sent in reports this month, but the reports, though few, are of interest, indicating what is being done, not only by these eight squadrons, but also of the others who, in a patriotic desire to save paper, have not written. The prize for the best report goes to Cadet J. D. Gates, of No. 40 F (Maidstone) Squadron, who tells me that in spite of some difficulties the modelling section of his squadron has been making rapid strides since its formation some three months ago. The squadron has been lucky in obtaining a room with good facilities for building, and the drill hall is suited for indoor flying, being large in dimension and clear of obstructions. Endurance models have been flown in it on a thread with great success. Scale models are mostly in favour. A 24 in. "Waco Custom Cabin" is in the course of construction, also a "Fairey Battle." Two cadets have clubbed together, and have started work on some old war machines, the Fokker D.7, Spad, Camels, etc. The squadron was presented with a kit of the "Comet II" which is well on the way to completion. This 'plane is powered with a "Baby Cyclone" engine, which does not seem to like pool petrol. Cadet Gates himself is working on a petrol model powered with a "Gwyn Aero" 7½ cc. engine, a photograph of which appears on this page. Cadet V. D. Clout has embarked on the difficult task of constructing a wind tunnel.

No. 79 (St. Joseph's College) Squadron sends a report by Sergeant E. Burgess, who tells me that before the war the proprietor of a local model store, an expert on building and design, was giving the squadron the benefit of his experience. The war whisked away the model expert and evacuation split up the model section, so activities had to cease for a time. However, a spark was still left glowing, and as soon as opportunity arose a further attempt was made, and though few in number the modellers display a remarkable keenness. The younger cadets favour solid scale models; Hubrick and Curtis have gained prizes in a recent competition for these. The older cadets are engaged in the construction of larger scale, fully detailed non-flying models of service types. Whilst only two duration models have so far appeared, a concerted effort by all concerned to construct a large petrol-powered flyer is contemplated. An exhibition is to be held shortly.

"Yours till I take an undamaged model home" is the plaintive ending to Lance-Corporal Marton's report from No. 145 Squadron. "We seem," he says, "to pay our subs. (or do we?) for the privilege of coming down to crack up our models, not many people taking a complete model home." However, Lance-Corporal Moss has bumped the "B" Class record up by 7 seconds. Lance-Corporal Middleton had stranger luck. In a fairly strong wind, his wing-tip touched the ground four times, then, with a long run *down wind*, it took off. No. 145 Squadron is at Altrincham Grammar School, and Lance-Corpl. Marston tells me that any aero-modeller would be very welcome at the flying field at Marlborough Road, Astley Road, Altrincham, on Sundays, at 2.30.

A solid craze has hit No. 118 Squadron this month, says C. B. Chadwick in his report of No. 118 (Belper Strutt School), the inspiration being the fine photographs and plan in the May issue of THE AERO-MODELLER. A prize is to be awarded for the best Sopwith "Camel," built from the plan in THE AERO-MODELLER. "Camels" are being mass produced at small cost in the woodwork room, and by June there should be a formidable squadron of them.

The Blackpool Wing is a new unit of the Corps, but Cadet W. A. Cradwell, who reports its activities, has been a reader of THE AERO-MODELLER for about three years. Cadets have been kept rather busy during the past few months in practising for the ceremony of the presentation of colours, which took place on Good Friday, but modelling is proceeding now, various contests being arranged among the flights. The modelling section has its headquarters at the Blackpool Cricket Club's ground.

No. 152 (City of Hull) Squadron is also busy on scale models at present, but one petrol model is under way. The Commanding Officer has shown a great interest in the modelling class.

For the first time we have a report from No. 48 (Hamstead) Squadron. Modelling here comes under the "Rigging Class," which is instructed by a qualified L.C.C. instructor, and the making of models is used to illustrate the construction of full size aeroplanes.

Corporal Hockey's report from No. 85 (Southgate) Squadron, is of great interest. "We have now been lucky enough," he says, "to obtain a room of our own fitted with benches, gas ring and water. This enables us to do more practical work, such as bending balsa wood over steam, and bending bamboo over dry heat. The gas ring now enables us to do jobs of soldering, making tangs and brides.

S.M.A.E. REPORT

Notes on a Council Meeting of the S.M.A.E. held at the Grafton Hotel, on April 14th, 1940, at 3 p.m.

Mr. Houlberg was in the chair.

Mr. Cosh stated that as this was the first Council Meeting held under war-time conditions, there were no minutes of the previous meeting to be read.

Mr. Cosh then formally announced that Mr. C. J. Burchell had been elected a Fellow of the Society. The Council warmly congratulated Mr. Burchell.

The Ebbw Vale Model Flying Club with twenty-eight members were affiliated.

It was stated that The Kingston and Hampton Hill Clubs had amalgamated under the title of The Thames Valley Model Flying Club. They applied for affiliation, which was granted.

The following clubs were reaffiliated:—

Birmingham M.A.C.	Letchworth M.A.S.
Blackpool M.A.C.	Mansfield.
Bolton M.A.S.	Newcastle (Staffs.) and
Bromley M.A.C.	Dist. M.A.C.
Cranwell M.A.C.	Northampton M.A.C.
Gloucester.	Short's M.A.C.
Leeds M.F.C.	Wirral.

Mr. Cosh then gave a report on the activities of the Emergency Committee. He stated that three meetings had been held, and during that time twelve new clubs had affiliated and thirty-eight reaffiliated, bringing the total number of clubs affiliated to the Society to 106. This figure did not include those clubs affiliated and reaffiliated at the present meeting. It is interesting to note that the total now approached the peak level of pre-war days.

Mr. Cosh stated that the 1940 competition programme had been fixed, printed and circulated to all clubs in less than one week.

With regard to the lectures, Mr. M. R. Knight had accepted responsibility of these, and the first one was now nearing completion. Mr. Knight has evolved a method to illustrate lectures, which obviates the use of lantern slides.

Mr. Cosh asked affiliated clubs to closely co-operate with the Air Defence Cadets, so that both the Society and the Cadets would benefit.

The Chairman then asked if any Council members wanted further enlightenment on the committee's work. One or two minor points were raised, and these were answered to the satisfaction of the meeting.

Mr. Stuart Davis, Chairman of the Croydon Club, then raised the matter of the resignations of Dr. and Mrs. Thurston as President and a Vice-President respectively. He was supported by the delegates of the Northern Heights M.F.C. and Cheam M.F.C. Mr. Davis asked for greater details on this matter, but the Chairman ruled the request out of order, as the meeting had not been convened for this purpose. Several speeches were made, and, at the request of the meeting, it was decided to call an Extraordinary General Meeting on April 28th in order to discuss the matter fully. During the debate, Mr. Yellowly, the Northern Heights M.F.C. delegate, called for the resignation of the Emergency Committee. It was then suggested that a postal ballot, in which all clubs should participate and have one vote each, should be held on any major point that the Extraordinary General Meeting brought to light. This proposal was passed.

Mr. Cosh asked that, if necessary, paid assistance might

be given to him in the work that this Extraordinary General Meeting would entail. This request was granted.

The Council then discussed one or two minor points in the competition programme. A misprint in the Journal has led to some confusion over the rules relating to the S.M.A.E. National Competition. This should read that each team member is to make three flights, i.e. a total of nine flights per team. The team whose total flights are nearest to 660 seconds to be adjudged the winner. Another small point was that in the Gutteridge Trophy the entrant must fly as a representative of the country of his birth.

The Biplane Competition was discussed, and various opinions were given on the wing area by Messrs. Bullock, Copland, Knight, Rushbrooke and Wickens. This produced a most interesting technical discussion, but no alterations to the Biplane rules were made.

Mr. Stuart Davis proposed a hearty vote of thanks to Mr. Houlberg for the able manner in which he had handled the meeting. The meeting closed at 6.30 p.m.

Report of the Extraordinary General Meeting held at the Royal Aero Club, 119, Piccadilly, London, W.1, on April 28th, 1940, at 3 p.m.

Mr. A. F. Houlberg, Chairman of the S.M.A.E., opened the proceedings by proposing that Commander H. E. Perrin, Secretary of The Royal Aero Club, be invited to take the chair at this meeting. Mr. J. C. Smith seconded this proposal, which was carried unanimously.

Commander Perrin read letters which had been received from Dr. and Mrs. Thurston confirming their resignations, and in his opening remarks he informed the delegates present that he had had personal interviews with the parties concerned, and he entirely agreed with the view that, in the best interests of the movement, any discussion on the matter was to be deprecated. Commander Perrin strongly advised the confirmation of the acceptance of the resignations, and the passing of a vote of thanks to Dr. and Mrs. Thurston for their past services. After a lengthy debate, it was agreed to accept the Chairman's suggestion. Mr. T. Wickens (North Kent) proposed that the whole matter be dropped, and a vote of confidence in the Emergency Committee be passed. This was seconded by Mr. M. Hall (Hornchurch) and carried unanimously.

Mr. S. Davis (Croydon) drew attention to a resolution passed at the last Council Delegate Meeting that all voting on major matters should be by postal ballot. Flt./Sgt. W. H. Crittle (Cranwell) proposed, and Mr. J. I. Faulkner (Blackheath) seconded: "That in view of the increased postal rates, the resolution mentioned should be rescinded." This was carried by 11 votes to 8.

F./O. Brousson proposed: "That the action of the Emergency Committee in accepting the resignations of Dr. and Mrs. Thurston be approved." Carried by 17 votes to 4. He also proposed: "That this extraordinary general meeting pass a unanimous vote of thanks to Dr. and Mrs. Thurston for their past services." Carried unanimously.

At this juncture Commander H. E. Perrin suggested an adjournment for tea. Mr. C. S. Rushbrooke proposed, and Mr. J. C. Smith seconded, that a hearty vote of thanks be accorded to Commander Perrin for

(Continued on page 406).



I'M going to get it in the neck a bit this month I'm afraid—but it can't be helped. The reason? Well, I have had instructions to squeeze the space devoted to Club News this month, as it is fully expected that restrictions engendered by the Scandinavian situation are going to mean a real "budget" on all paper stocks. (You will know by now the position even with the ordinary newsprint—and believe me, publications such as this are even more drastically restricted than the daily Press). Just one more thing to hold against that "dear old benefactor" Hitler!

So chaps, apart from this explanation, I wash out all my usual preliminary chatter, thereby enabling as much individual report matter to be included as possible—and that will have to be drastically "weeded." However, we look forward to a lessening of the constraint on supplies, and till then—well, we just have to grin and bear it.

Trouble is, never before have I received so many, such lengthy, and such interesting reports—and it is no sinecure of a job to know where to start, finish, or use the axe! But, like the bloke who never looked before he slept—or was it the rolling stone who gathered plenty of dirt—I plunge into the thick of it, and who cares where I come out? You do! Am I mortified?

To generalise, most clubs seem to have experienced a spell of better weather lately, and times, general flying, and mainly general interest, have all taken an upward bound. This is all to the good, and with many models being built we seem to have lost all the panic that reared its ugly head only a few short months ago. Actually, many clubs report increasing memberships, and in a number of cases

the war-time strength has exceeded that enjoyed under more peaceable conditions. Just another smack at old Goebbels and his gang of radio Haw-Haws.

Overseas news this month come from a well-known American modeller—Ted Just, of 1305 Saylor Street, Johnstown, Penn., U.S.A. I reproduce a couple of snaps he sent in, one being of his 1939 Wakefield job which averaged 261 sec. at the National Contest in Detroit, weight 8.17 oz. The other shot is of a couple of "gas-buggie" enthusiasts out in the cold, cold snow—and looking fairly pleased about it. Thanks, Ted—and send along more when you have time.

The other item comes from thousands of miles from America—this time from India. H. Khan sends a snap of self and model—a "Lynx," I believe—and says, "I am trying my level best to carry on the hobby here, but I must say it is most difficult, as I get very little time to make, fly and repair. Also these wild people laugh at the sight of a model, and think that I have gone out of my mind by playing with little bits of wood stuck together with cement and paper." The address given is just N.W.F.P.—which, I take it, means North-West Frontier Police—so we must form our own conclusion as to just who the "wild people" are. But it's surprising how international this game is, isn't it?

The PARK M.A.I. decided on a curtailed programme for 1940 at its recent A.G.M., this mainly coinciding with the S.M.A.E. fixture list. This club is in a very sound position, and I am pleased to see that Mr. Dillstone is now the president. Records recently adopted in this club are:

Glider (winch-launch), A. A. Weston	177
Seaplane (tank), H. R. Jeffs	117.65
Scale (H.L), V. Dubery	93.2
Not a bad list, eh?	



Keeness personified! Members of the Forfar M.A.C. mentioned in last month's "Aero-Modeller." (Editorial "tail-piece.")

Another club well positioned and founded is the HAYES AND D.M.A.C., who have unfortunately had to give up the "best ground in the country" for the time being. Their competition report for 1939 makes formidable reading, they having really swept the board in petrol events, won the South Coast Gala inter-team event, and placed second in the National Cup. Three British records are also to the credit of this club—the Seaplane, Biplane R.O.G., and the Glider H.L. Mr. A. Wilson won the club "Fairey Cup," with Mr. J. Marshall collaring the "Club Trophy." Last year's King Peter event has stimulated interest in large gliders, and it will be interesting to compare these with the foreign machines that competed last year.

The SOUTH BRADFORD M.A.C. held its first models exhibition on March 2nd, which turned out a very successful affair. Application for affiliation has been made—Good! Flying ground has been lost to the "Dig for Victory" campaign—Bad! Still, we must not grumble these hard times.

Just as contrast to the luck of the Bradford boys, the SHORT'S M.A.C. report the acquisition of a splendid field, even though it is bounded on one side by a thick wood—as a number of members have already discovered. Pole-flying has been indulged in at the local canteen, and the club funds have been nicely augmented by a £10 "rake-off" from a binge held at the local casino. Di da, di da, di da! Littel gel—how dew yew do it?

A new club to be formed is the ST. IVES M.A.C., the bloke to get in touch with being R. Sellins, of 6 Park Avenue, St. Ives, Hunts. Good flights have been obtained, the club record standing at 147 sec. (I am told that some sarcastic children accuse the members of covering their models with *toilet paper*! Go away you rude little lads).

Don Wright put up the best time of the day at a recent combined meeting of the WATFORD M.A.C. and the St. Albans Club, his machine clocking 155 sec. Mr. Morgan, of St. Albans, won the heavy-weight event with an average of 80 sec.

The newly-formed EBBW VALE M.F.C. certainly seem to be in the money. Formed on August 23rd, 1939, they have a matter of £22 to their credit—which is very good hearing, as I am of the opinion that far too many clubs die an early death through lack of suitable finance. Correspondence is welcomed from other clubs.

Kinder weather has brought out a crop of new records in the HORNBURCH M.A.C., including the following:

Biplane R.O.G., B. Aldridge	... 73 sec.
Light-weight R.O.G., L. Ransom	... 291 ,,
Gliding (tow launch), L. Ransom	... 67 ,,
Indoor fuselage H.L., O. Thomas	... 75 ,,
Indoor fuselage R.O.G., W. Shadforth	483 ,,

The latter, microfilm types, were flown at the Albert Hall. Will you please note that all communications should now be forwarded to the new secretary, Mr. D. A. Gordon, of 26 Birch Crescent, Hornchurch, Essex.

Members of the HALIFAX M.A.C. have been testing new models, mostly of the Wakefield class, in which these chaps seem to specialise, and the results augur well for the club once more to show a clean pair of heels to the rest. New members have been enrolled, and an exhibition is to be held in an endeavour to induce further increases in this direction. It is hoped to attend as many open events in the North as travelling facilities allow.

Plans! Plans!! Plans!!!

Have you your copy of the fully detailed plans for building Bob Copland's Wakefield Model? This cannot be beaten for contest work, and at the low price it is worth anybody's money to have a set of these drawings on hand.

THE AERO-MODELLER Special Offer consists of:

Full size plan, 35 in. x 45 in.

Additional sheet, 11 in. x 17 in.

Instruction leaflet.

Price: 1s. post free.

In connection with the above a special competition will be conducted for valuable cash prizes. Get your entry form from THE AERO-MODELLER Offices, forwarding a stamped addressed envelope.

Another super duration model—suitable for the new S.M.A.E. specifications for the "Flight Cup" Competition—is the "AIR CADET," designed by Mr. C. A. Rippon.

We have had glowing reports from readers who have already built and flown this model, and you are assured of a tip-top performer should you also construct this well-designed and robust aircraft.

Full size detailed plan, size 35 in. x 22 in., 6-page construction leaflet.

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THE AERO-MODELLER,
Allen House,
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Leicester.

Some Scots from the FIFE M.A.C. recently made a determined attempt on the existing British H.L. gliding record, when six ambitious members motored to Bishop's Hill, near Loch Leven, and made their onslaught after an arduous climb. Wind was against success, however, and the best time was 2 min. 20 sec. A second attempt will be made in the near future. An inter-club event will be staged by this club on May 25th at Chapel Farm, near Kirkcaldy, when three events will be held.

More Scottish news is from the ABERDEEN M.A.C., who state that the winter's hibernation is now ended. The *Press and Journal* Indoor Cup was won for the second year in succession by G. Stephen with an average time of 42.6 sec.

Still punting around the world we get some Irish news this month from the ULSTER M.A.C., who forward details of an interesting Gala Day scheduled for June 22nd, when four contests will be held. This club is anxious to compete in the Gutteridge Trophy event, and to encourage support is paying the entry fees and incidental expenses of such competitors that show good form in a prior competition. Good idea this, and to be widely recommended. A. C. D. Skelly won the "Zenith" contest with a time of 81.8 sec., best flight 132 sec., while A. E. Bingham won the "Hector Powe" Cup with an average time of 48.8 sec.

BLACKHEATH M.F.C. have begun the competition season with a bang. At the first of the indoor meetings

held at the Albert Hall they managed to walk away with all three places, R. W. Mackenzie, R. Brown and Bill White coming first, second and third respectively. The second meeting saw Mackenzie and Brown again coming first and second, and this time they both broke the British indoor R.O.G. record. This now stands to Mac with a time of 8 min. 43.2 sec. Blackheath now hold twelve British records.

The club has decided to hold an open day at Epsom during the summer, and full particulars will be forwarded to club secretaries as soon as they are ready.

won the Secretary's Trophy. Nice going, youngsters. A member has brought out a weird contraption for the launching of gliders, being formed from the rear portions of a bicycle. Promise is expressed of this invention.

A further exhibition staged by the ASHTON AND D.M.A.C. raised the sum of £4 10s. for charity—which is a stout effort when remembering their previous efforts in this direction. C. Wyatt won the recent "Under 150 sq. in." contest with an average time of 90 sec.

Winners of the first event of the season of the WAKEFIELD (Yorks) M.F.C. were J. Tye (average



Top (left to right) H. Khan, of India, with his "Lynx." A neat model built by 14-year-old N. Hardman, of Prestatyn. Wakefield model by F. Wilde, of Chester, in flight. Nicely posed "Clodhopper," by J. Moore, of Rye. Middle (left to right) Looking for Sealyons an' Seorls? A. Turley, of Speldhurst.—A neat "Flea" constructed by E. G. Holt, of Hale.—Mr. Sayer, of North Kent, with his 1938 British record holding flying-boat.—Puzzle Corner! Bottom (left to right) Nice "gas wagon," by J. Smith, of Renfrew.—R. Sellens, of the newly-formed St. Ives Club.—Finely detailed Wakefield by E. Bingham, of the Ulster Club.—Another "young" effort, this time by 14-year David Wattie, of Newby. Centre: Semi-scale model by Mr. Archbold, of Harrow. Model boasts retractable undercart.

I am asked to correct a slight error in the description of Mr. Wades's—HIGH WYCOMBE M.A.C.—radio-controlled model. This should have read 1½ lb. and not 9½ oz. as stated. Just a slight difference, what? A fine flight of 49.6 sec. made by Mr. Harvey's "Heston Phoenix," built from plans given in THE AERO-MODELLER, creates a new record for this type, while another record to go is the winch-launch glider, now standing at 122 sec., the holder being Mr. Day.

Even more new records! This time it's the WALLINGTON M.A.C., who send the following:

H.L. Duration, Mr. Ball	...	77 sec.
R.O.G. Duration, Mr. Sutton-Smith	48	„
Glider, Mr. Green	...	210 „
Scale, Mr. Sutton-Smith	...	33 „

Mr. B. Hollis, of the WOKING AND D.M.A.C., won the Club President's Trophy, while another junior

52.7 sec.) and R. Blockley (43.1 sec.). The announcement is made of the death on Active Service of a member, Dennis Flynn, which we much regret with the rest of his fellow members.

The club duration record of the WIRRAL M.A.S. has been raised to 5 min. 12 sec. O.O.S. by Mr. Cameron.

John Wheatley, of 8 Bullerton Road, Wallesey, Cheshire, wishes to get in touch with other enthusiasts—so if any of you want a "pen pal" here's your chance.

The WEST SUSSEX M.A.S. indoor giants have been at it again, and with the introduction of a new standard of pole a fresh set of records has been instituted.

3 FT. POLE. 3 FT. 6 IN. LINE.

H.L. Duration, R. Warring	3 min. 38.8 sec.
H.L. Scale, F. Gates	1 min. 44.6 „

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M. (Rotherham): "Flight of 12½ min. in club competition with my 'Clipper.'"

R.C.W. (Sidmouth): "I have not yet flown my 'Clipper' on full turns, but have had durations of 2 min. 17 sec. and 2 min. 26 sec."

M. (Isle of Skye): "I should like to congratulate you on the service, also the value of a Condor 'Clipper' kit. I have constructed many other models, products of other firms, but none possess such simple construction and sound flying qualities."

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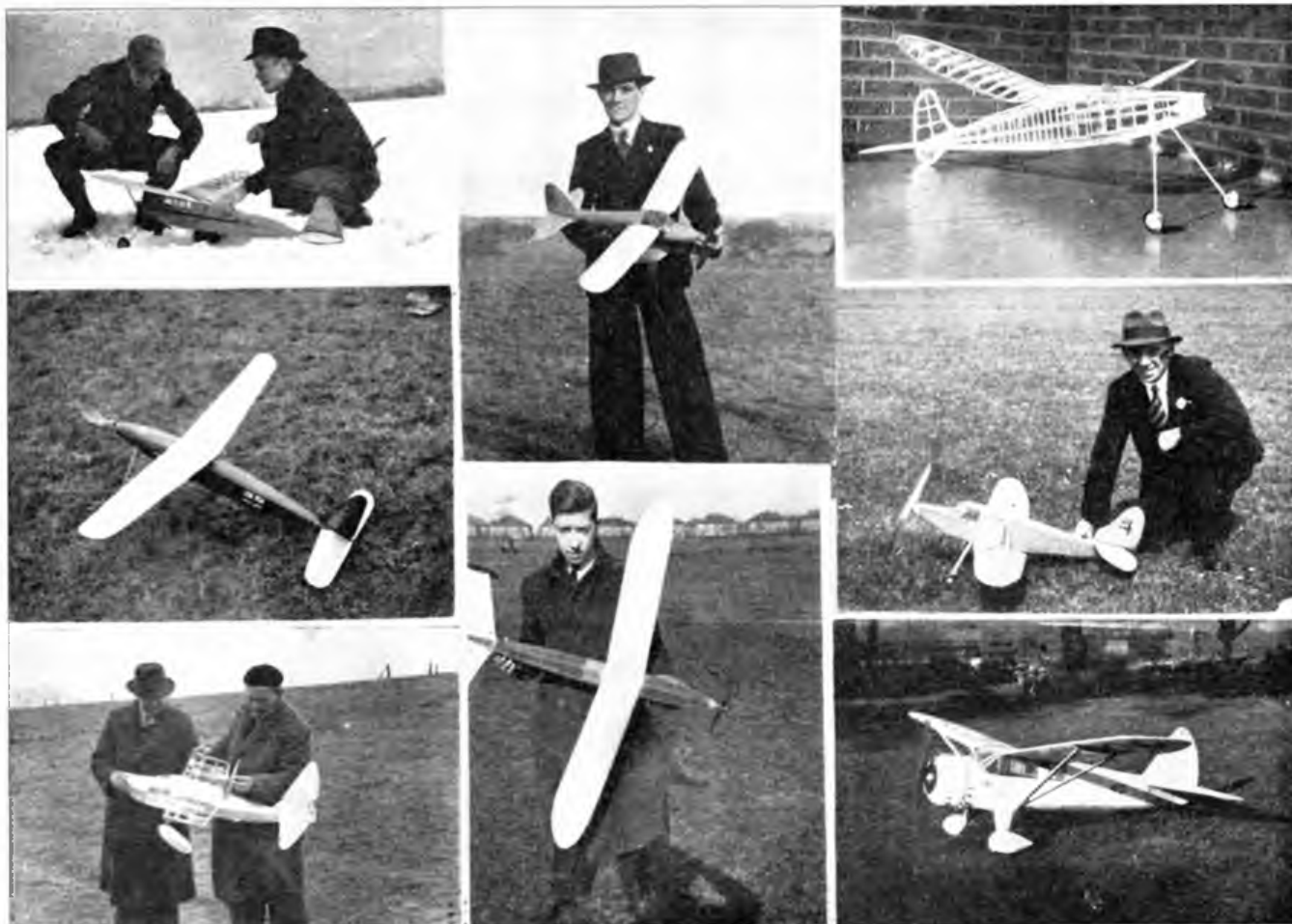
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2 FT. POLE. 3 FT. 6 IN. LINE.
 H.L. Duration, R. Warring 3 min. .0 sec.
 R.O.G. Duration, R. Warring 2 min. 23 ,,
 H.L. Scale, F. Killick ... 57.2 ,,
 R.O.G. Scale, T. Clements ... 20.6 ,,

I don't know of better times anywhere, and it may interest you indoor fans to know that Warring has fitted a retracting undercart to his indoor flyer to give greater clearance when the model is just skimming the floor on the

W'field R.O.G., G. S. Stevenson ... 110 sec.
 Sailplane, W. Simmonds ... 57 ,,
 Scale H.L., W. Cree ... 35 ,,
 Scale R.O.G., W. Cree ... 29 ,,

Meetings of the EDGWARE M.A.C. are now held at the Constitutional Club Rooms, Manor Park Crescent, Edgware. Mr. H. Walker won the first competition of the year with a time of nearly 6 min., while a second event was won by Mr. J. Holloway.



(Top left and right) Two American enthusiasts out in the cold, cold snow-ow-ow!, and Ted Just's Wakefield model that did so well in the Nationals last year.

(Top centre) Mr. Harvey, High Wycombe, with his Heston Phoenix that clocked 49.6 sec.

(Middle left) A "Flying Minutes" built by E. Gledhill, of the Halifax M.A.C.

(Middle right) Mr. Martin, of the Stockton-on-Tees M.A.C., with his "Cruiser" low-wing model.

(Bottom left) Rip and Towner examine the latter's super "Spencer Larson Amphibian." Mechanical drive works the pusher type propeller, and rubber is situated from nose to trailing edge of wing, thereby keeping the weight well forward.

(Bottom centre) E. H. Metcalfe, of Manchester, 16 years old, with his "Victrace."

(Bottom right) A 5 ft. span "Mr. Mulligan," built by E. Sellwood, of the Salisbury Club.

last few laps. These chaps are also making a very good showing with Wakefield outdoor types, and I look to hearing some startling times later on.

Half-a-dozen new members have been enrolled into the WHITSTABLE T. AND D.M.A.C. through the medium of an exhibition staged, and it is hoped to hold inter-club meetings with others in the near vicinity. Records here are:

Duration H.L., G. S. Stevenson ... 225 sec.
 Duration R.O.G., G. Widdow ... 126 ,,
 W'field H.L., G. S. Stevenson ... 225 ,,

The SPELDHURST (Kent) M.A.C. are experimenting with seaplanes, and one member unfortunately lost his model after nearly 7 min.

The WARWICKSHIRE M.A.C. held a successful exhibition, prizes being given for certain of the exhibits, among these being an extremely well-built hydroplane powered by Synchro Ace and airscrew. Though the weather was a bit rough for outdoor flying, F. Harris put up times of 59, 63 and 67 sec. to win a duration competition, while Mr. Hewitt came second with an average of 59 sec.

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Spring flying conditions are ideal for trying out New Models. Choose your kit to-day.



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length 25 in., weight 2 1/2 oz. Price, complete kit, post free, only 18/6

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For a limited period only we are offering full size "Lynx" plan and instructions, all printed balsa and M.S.S. famous 1940 catalogue for 3/6. Post free. Plans and printed balsa of "Lynx Cub," 2/6 complete with M.S.S. Catalogue. Post free.

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I thank the TORQUAY AND D.M.A.C. for a copy of their club magazine, which is a very good effort. G. Pearce won the "solid scale" class with an excellent model of the "Hampden," complete with retractable landing gear, with the "built up" contest going to G. Hardwick with a Messerschmitt 109. A flying scale event was won by the secretary, C. H. Aggett, who flew a "Fairchild 24" for a time of 52.5 sec.

Good weather favoured the first contest of the TROW-BRIDGE AND D.M.A.C., the result being:

L. W. Dallimore	...	...	av. 84.58 sec.
G. Brewer	...	...	" 59 "
W. T. Morris	...	...	" 58.33 "

Bob Baskcombe, of the NORTHAMPTON M.A.C. (seventh in last year's Wakefield Trials), won the first club event of the year, only requiring two flights to beat the rest with three flights. A member has made a pedometer, which should be handy for measuring the distance travelled by a model. (What about building me an "elbowometer" to discover the distance travelled in one year when lowering—all right!)

HACKNEY M.A.C. beat the Leyton club in an inter-club contest, Mr. Teff putting up the best time of the event with 2 min. 20 sec. This club reports larger membership than pre-war—which is quite a nice state of affairs.

N. Blacklock won the first round of the HARROW M.A.C. Major Cup with a time of 62.9 sec., while L. Johnson won the Pinora Cup round with 83.5 sec., the latter event being for gliders. Mr. Howarth had bad luck when his "pusher type" machine clocked 6 min. 45 sec.—but with only one watch on it. Just the sort of thing that prevents national records being claimed. Fresh 1940 records in this club are:

Heavy-weight Duration, N. Blacklock 154 sec.

Light-weight Duration, — Gent ... 152 "

Biplane Duration, — Gent ... 70 "

Bill Fields, of the CHEAM M.A.C., secured third place in a visit to the Croydon Club at their new ground, his Wakefield model aggregating 289 sec., while Mr. Begernie won the gliding event with flights of 71 and 120 sec. In winning a club light-weight event the following week, P. Kelsey set a new record of 214.5 sec. O.O.S. Four models were lost during an inter-club event with the Bushey Park Club, whom Cheam beat by 45 points to 10. Fields made a new Wakefield club record with 293.5 sec.

The BEDFORD M.A.C. are now affiliated, and have over 75 members on the books. An Easter Sunday meeting for the "Golding Cup" was won by Mr. Jackman, who lost his model on its first flight of 460 sec., after losing a previous model when testing. Neither model has been seen since. N. Cluer placed second with an average of 143.6 sec., with Mr. Barrett third at 129.6 sec.

More news from Ireland comes from the DUBLIN M.F.C., this club's team winning the team event in a recent contest with an average for the team of three of 71.6 sec. The Irish J.A.C. were second and Portmarnock third. H. Charles, of the Ulster M.A.C., won the heavy-weight event with a 79.2 average, at the same time putting up the best time of the day at 110.4 sec. J. Daulman, of the I.J.A.C., won the biplane event with an average of 69.8 sec., while Charles swiped the medium-weight event at 62.9 sec. J. McGregor won the Wakefield Class with an average time of 47.1 sec.

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The IRISH JUNIOR A.C. are to hold their second Model Aviation Day on July 21st, and all are invited. Particulars can be obtained from the secretary, Chris F. Bruton, 7 Crampton Quay, Dublin, and from the list submitted this meeting should prove most interesting. Now then, any of you going across to Ireland for a holiday this year?

Oih! Who is Press secretary to the NORTHERN HEIGHTS M.F.C.? I've got a duplicate report this month—but that's better than none at all methinks. This club goes from strength to strength, and with 57 new members since last October this well-organised body now gets near the 200 mark for membership. Blimey N.H.—where do you all sit?

Numbering many accepted experts among their members, great concentration is going ahead on trimming models for the season, and at a recent meeting Wakefield "fans," after waiting for evening conditions, were putting up remarkable times. Bob Copland put his 1939 model up at 8.20 p.m. and, with the moon shining nicely, clocked 4 min. 18.75 sec. Very tasty—very sweet! Which gives point to Korda's statement that "Bob had the best machine at the contest last year, and it was a tough break that he did not win." I think that is a very sporting statement from the eventual winner.

Loss of ground to the universal ploughing has not deterred these chaps, and a new ground at Holly Farm, The Ridgeway, Botany Bay, Enfield, has been well attended. Mr. S. Collins won a scratch contest with

a time of 113 sec., while J. Rees won the annual Construction and Finish event.

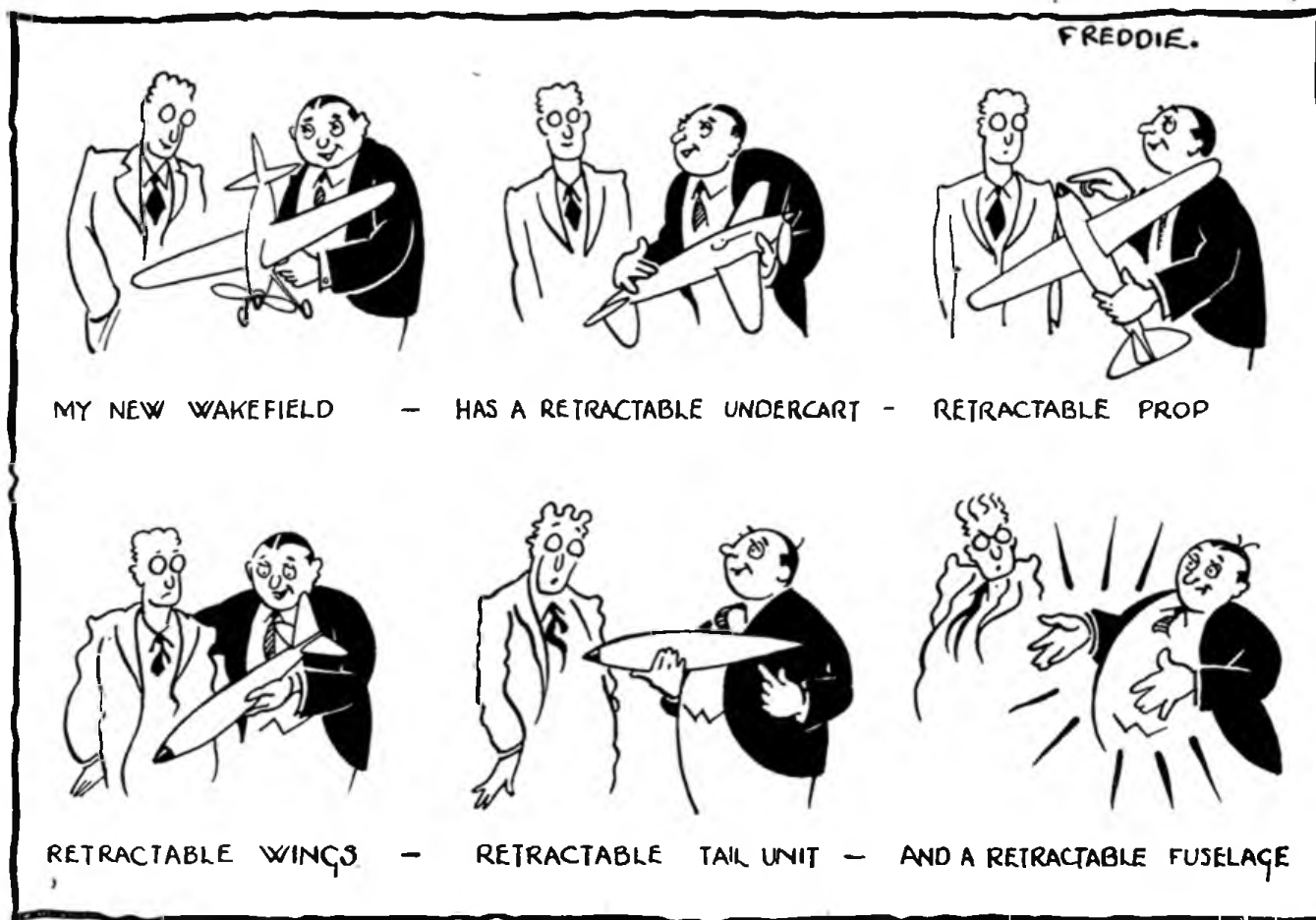
The Stoneygate Club has been reorganised under the title of the LEICESTER M.A.C., with subscription fee of 5s. per annum, all competitions free. Mr. Farmer has presented a cup for monthly competition, with the events alternating for both rubber-driven jobs and gliders. The usual field having been "mucked" ready for meadow land, any news of a suitable field would be appreciated.

Talking of gliders, S. Reading, of the CHESHAM AND D.M.F.C., got a flight of 18 min. 30 sec. with a "Stothers Glider" built from THE AERO-MODELLER plans. Launched from a 100 ft. towline, the model was lost and eventually found over three miles away.

With ideal conditions the GLASGOW M.F.C. held its initial competition of the year, when J. Maxwell won the event for 50 sq. in. spar models. Larger club premises have been obtained at the Christian Institute, 70 Bothwell Street, Glasgow, where meetings are held every Friday. Please note change of address of the secretary, Mr. George Sowter, who now resides at 724 Crow Road, Glasgow.

In common with many another club, the EAST BIRMINGHAM M.A.C. has adopted "Trees" as its signature tune. You should hear me singing it under action. New members are enrolling at the rate of one per week, and a welcome is extended to any lone hand in the district.

Jolly interesting letter from the CARDIFF M.A.C.



RETRACTION AD INFINITUM

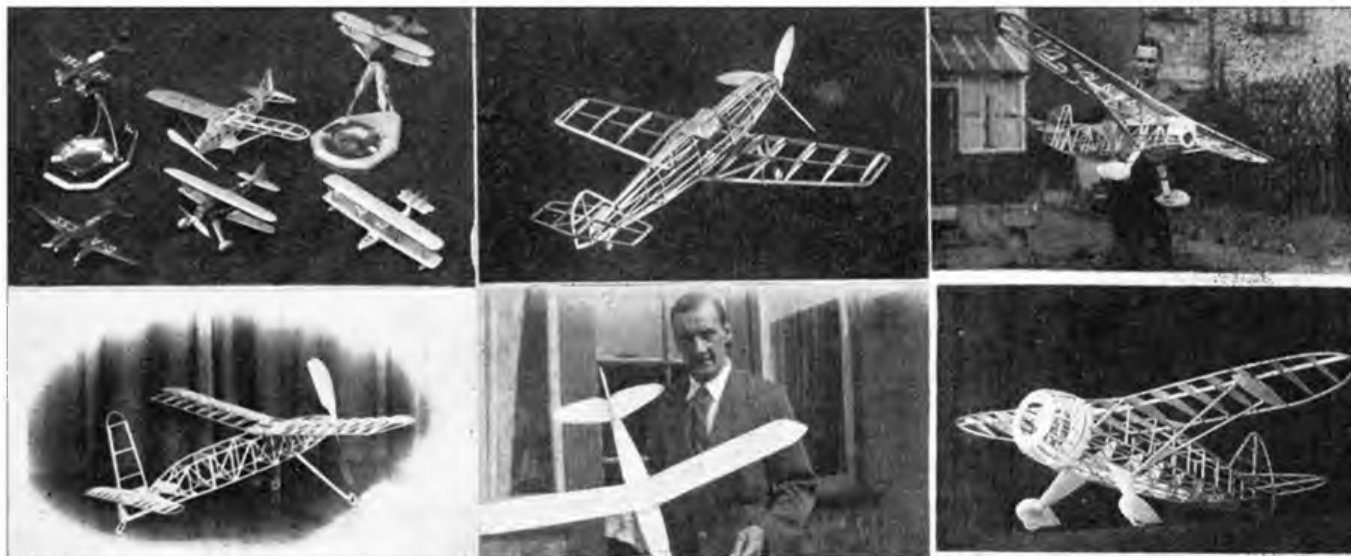
as usual, and my only regret is that I cannot print it anywhere near in full. Still, I hope my slashing does not put you off Watkins, and please keep it up. You cheer me no end—de da! Main points of note are the raising of the club record to 4 min. 59 sec. O.O.S. by Bud Morgan (Itma) and the results of two well supported contests. The first, for the First Monthly Event, was won by A. Brewer with an average time of 83.6 sec., followed by H. J. Watkins, 74 sec., and K. G. Sims, 65.7 sec. The interesting thing about this event,

OPEN DURATION.

Lucas, Stone, Henwood.

Membership is now about sixty, a very healthy state of affairs. By the way, Mr. H. J. Tugwell is now secretary to this club, his address being 27 Stanley Street, Brighton 7.

A social and sporting side has been added to the activities of the STOCKTON-ON-TEES M.A.C., who have just held a very successful inter-club event, in spite of windy conditions. Full results are given here:



(Top left) A fine collection of models and trophies by Mr. Bishop, of the Gloucester and District M.A.C.

(Top centre) How's this for an effort by a 13-year-old? An Me.109 built by Paul F. Peeks, of Hanwell, from "Aero-Modeller" plans.

(Top right) H. E. Bateman, of Walthamstow, with his finely detailed gas model of the U.S.A. Navy Racer. Span 6 ft. 6 in., weight 3½ lb.

(Bottom left) Who said a camel was the only one with the hump? But F. Craigie, of Glasgow, evidently believes in plenty of room for the rubber—and who can blame him!

(Bottom centre) W. Jones, of Leicester, with his "Air Cadet" that has shown such remarkable form on initial flights. (See text).

(Bottom right) A 36 in. "Mr. Mulligan" built by BM/RLDG, of London.

which consisted of three flights—H.L., R.O.G. and H.L. in that order—was that in most cases the best times were put up in the R.O.G. round. Amazinaintit!

Bud Morgan—what, again?—won the Watkins Cup event with a 119.3 average; second, A. Roberts with 106.8 sec.; and third, T. Morgan, 60.6 sec. Roberts made best time of the day with a flip of 194.9 O.O.S. I am rapped over the knuckles for not stating last month that this club had applied for reaffiliation. Sorry! And instead of talking about some asbestos gloves, what about presenting me with a pair? Would they come in handy —.

Results of recent events in the BRIGHTON DISTRICT M.A.C. are:

HANDICAP DURATION.

P. Lammimar	...	...	...	170 points
T. Lucas	...	...	...	120 "
F. Thomson	...	...	...	115 "

LIGHT-WEIGHT DURATION.

F. Thomson	...	...	...	269 sec.
T. Lucas	...	...	...	245 "
T. Lance	...	...	...	210 "

DURATION.

Lucas, Thomson, Lammimar.

EVENT NO. 1 (under 30 in. span).

	1st.	2nd.	3rd.	Total sec.
1. Mr. Butterfield (Darlington)	26	31	32	89
2. Mr. A. Hinchliffe (Stockton)	34	19	30	83
3. Mr. Todd (Darlington)	...	30	19	27 76

EVENT No. 2 (over 30 in. span).

1. Mr. Brewer (Middlesbrough)	82	70	139.5	291.5
2. Mr. Rigg (Stockton)	...	100	64	68 232
3. Mr. Broady (Stockton)	...	57.5	64	62 183.5

EVENT No. 3 (knock-out contest).

Winner, Mr. R. Johnson (Stockton).

EVENT No. 4 (nearest to 40 sec.).

Winner, Mr. R. Johnson (Stockton). Time of 34.5 sec.

EVENT No. 5 (Wakefield class).

Winner, Mr. K. Rigg (Stockton)	71	72	61.5	204.5
Mr. J. Fraser (Stockton)	...	86	91	— 177
Mr. R. Johnson (Stockton)	...	45.5	45.5	56 147
(Stockton)	45.5	45.5	56	147

Since the disbanding of certain clubs around the Romford, Essex, district a new body has come into being

under the title of the PHOENIX M.F.C., which is apt at least. These chaps would be pleased to hear from other clubs in Essex regarding their 1940 programmes, and hope to hold invitation meetings themselves.

The HINCKLEY M.A.C. held a successful exhibition, followed by a duration "own design" contest, won by C. Palmer with a time of 64 sec. (They tell of the chap who spent hours carefully cutting out the 40 odd ribs for the "Flying Minutes," and then when supper called got 'em mixed up with the odds and ends, and bunged 'em in the fire. Blue pencil, blue pencil —).

F. Longson, of the BEVERLEY AND D.M.A.C., raised the club towline glider record to 3 min. O.O.S. off a 20 ft. line, while on a recent Sunday Messrs. Elwell. Gray made flights ranging from 2½ min. to a top of 5 min. by the latter fellow. This club is to hold a rally on June 2nd, commencing at 11 a.m., when five events will be staged. Those who wish to camp on the field may do so after getting in touch with the secretary. Entry forms for the contests, which must be in by May 31st, can also be obtained from the same source.

An "Air Cadet" built by the CHELTENHAM M.F.C. clocked 37 sec. R.T.P., following up by showing some good times outdoors.

D. Andrew, of the SHEFFIELD AIR LEAGUE SOCIETY, made a record flight with his model on April 6th, when his model was last sighted after being in the air for over 4 hours. Now can yer?

The Invitation Gala Day staged by the CROYDON AND D.M.A.C. on Easter Sunday was a huge success and well supported. Some fine models were in evidence. Mr. Golding having a 9 ft. monocoque sailplane weighing 47 oz. (mind my bike!). Mr. Gilroy won the nomination event, also collecting second place in the duration event with a total of 344 sec., being beaten to first place and the Stuart Davis Cup by Mr. Piggot, who totalled 348 sec. During this event Mr. Gilroy raised the club light-weight record to 183 sec. Mr. Headech raised the indoor club record to 85 sec. Indoor flying is to continue during the summer months.

Mr. W. Jones, of Aylestone, Leicester, gives details of the results he gained with a new "Air Cadet" model just built. Its first three flights were 60, 78 and 95 sec., the last flight terminating on contact with the top of an electric pylon. This is proof indeed of a good model, and endorses many other glowing reports of this model.

K. Haines, a non-member, won the nomination event

staged by the SOUTH BIRMINGHAM M.F.C., with W. Lough and C. K. Duffield chasing him in.

Well, they say the last should be first, and the report of the ROTHERHAM M.F.C. also contains news of the picture that heads these columns this month. This interesting 'plane, built by A. V. Wilson, the hon. secretary, carries two separate motor containers, each mounting a 9 in. propeller, both cut right-handed. It is claimed that this job is exceptionally steady in flight. Good workmanship and rather exceptional photography are evident here. This club is going ahead well after its first year of working, and finds aero-modelling a good tonic against Hitlerism.

The COTEBROOK AND D.M.E.S. have arranged an open meeting for June 15th, when flying will take place for the "St. John and Holy Cross Silver Challenge Cup." Details can be obtained from the Secretary, Mr. H. Morrey, of Utkinton Lane, Cotebrook, Tarporley, Cheshire.

Well, before finishing, here is a list of changes of addresses, etc., that you might like to note:

DEVON AND EXETER M.A.C. again functioning.

Mr. C. Thorne, Lamp Cottage, Alphington, Exeter.

WESTON-SUPER-MARE M.A.C., also out of hibernation.

Mr. F. Lindsey, "Terra Nova," Shaftesbury Road, Weston-super-Mare.

STREATHAM M.A.C. Reformed—— tch tch.

W. P. W. Stokes, 13 Drakewood Road, Streatham, S.W.16.

HAWKER M.F.C. Change of secretary.

Mr. G. Brassington, 35 Pinfold Road, Streatham, S.W.16.

EPPING M.A.C. New club.

Mr. C. Pollitt, 37 Regent Road, Epping, Essex.

And so to bed, and there to dream of the days when one burnt old paper and the Sunday bunch of radishes was wrapped in superfine tissue. As they say—hope springs eternal, but winter blasts a heck of a lot. May your undercarfts never fold up on you till after at least the tenth pint!

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CHISWICK.—A. A. Baker, 526 High Road, Chiswick. Large stocks kits and all accessories. Agents for Hobbies, rubber, dopes, cements, tissues, etc. Blue prints, balsa, spruce and birch. Splendid selection. Telephone Chiswick 3816.

CHISWICK.—Jones Bros., 56 Turnham Green Terrace (Chiswick 0858), stock balsa wood and cut special sizes as required. Agents for Club, Cloud, Aeromodels and Scalecraft kits. Caton's rubber. Joyplane products. Large stocks of propellers and all accessories.

DUMFRIES.—Campbell's, 46 High Street. Penny stamp brings our price lists. Balsa, stripwood, dopes, kits, all sundries, Skybirds, Skyryda, Aeromodels, Studiette, Tower, Comet; hand-painted tarmac paper, 9d. per sheet, post free.

EDINBURGH, 8.—“Calling All Aero-Modellers!” Whatever your requirements, Frank Royle, 54 South Clerk Street, is at your service. Fullest range of kits, balsa wood, petrol engines, accessories. Illustrated catalogue, 3d. post free.

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

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SEVEN KINGS.—A. Barnett, 420 Green Lane. Stockists of Joyplane and other model aero products.

STAFFORD.—Aircraft Models, South Walls, is just the place to call and see a real variety of models and obtain advice on the best way to buy from modellers like yourself.

WARRINGTON.—Burton's Model Aero Supplies, 23 Bewsey Street. Aeromodels, Drome, Tower, Cloud, Studiette, Skylead, Scalecraft, Keelbild and Penguin kits. Drome, Joy-Plane and Studiette accessories.

WILLESDEN'S Leading Aero-model Suppliers—Wood's Sports Ltd., 98 Chamberlayne Road, Kensal Rise, N.W.10. Comprehensive stocks of all kits, materials and prints. Write for free catalogue. Phone LADbroke 1414. Buses Nos. 6, 46, 52, 70 stop at door.

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S.M.A.E. REPORT.—(Continued from page 395).

his services in the chair. This was carried unanimously and the meeting thereupon adjourned.

The meeting was resumed at 5 p.m., Mr. D. A. Russell taking the chair at the invitation of those present.

The filling of vacancies on the Emergency Committee was next discussed at some length, and the following resolutions were put to the vote:—

Proposed by Mr. C. A. Rippon, seconded by Mr. J. G. Wallens: "That the President of the Society shall not act as a working member on any committee." Carried with one dissentient.

Proposed by Mr. R. T. S. Gillett, seconded by Mr. C. A. Rippon: "That with the exception of those already elected on the Emergency Committee, the remaining names on the ballot rota be deleted." Carried unanimously.

Proposed by Mr. E. F. H. Cosh, seconded by Mr. C. A. Rippon: "In the event of a vacancy occurring on the Emergency Committee, this be filled by vote at a quarterly Council meeting, the item being inserted in the notice of that meeting." Carried unanimously.

Proposed by Mr. A. F. Houlberg, seconded by Mr. C. S. Rushbrooke: "That the Emergency Committee shall consist of thirteen members." Carried unanimously.

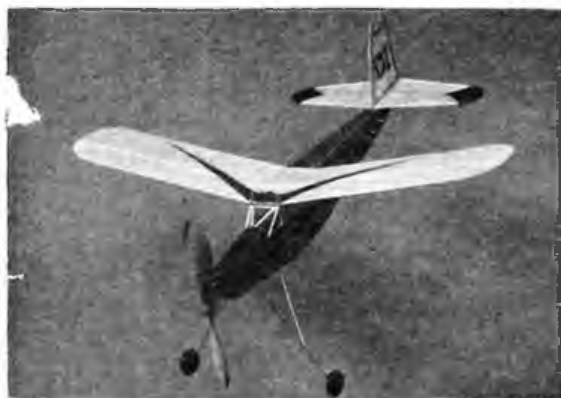
Proposed by Mr. A. F. Houlberg, seconded by F./O. P. R. S. Gutteridge: "That the vacancy which now exists be filled in accordance with the previous resolution." Carried.

Amendment.—Proposed by Mr. J. I. Faulkner, and seconded by Mr. T. Wickens: "That the vacancy which now exists be filled to-day." Defeated by 12 votes to 9.

Messrs. E. F. H. Cosh, H. York, D. A. Gordon, C. A. Rippon, and A. G. Bell signified their desire to resign. At the request of the Chairman the first four gentlemen gave the reasons for their decision, Mr. Cosh making it clear that he wished to resign, not only from the Emergency Committee, but also as Hon. General Secretary and Editor of the S.M.A.E. Journal. Captain J. Blunt proposed the following resolution: "That those present at this Extraordinary General Meeting express their very deep regret at the tendered resignations and request those concerned to reconsider them." This was seconded by Mr. C. S. Rushbrooke and carried unanimously. A number of delegates spoke in support of the resolution and the resignations were withdrawn. Mr. E. F. H. Cosh and Mr. D. A. Gordon agreed to continue their work as Hon. General Secretary and Assistant Hon. Secretary respectively for a short period.

The meeting terminated with a hearty vote of thanks to Mr. D. A. Russell for his able chairmanship during the second half of the meeting.

H. YORK, *Hon. Press Secretary.*



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Appendix - Links to the plans

The issue comes with the full size plans for building a 15" stick rubber model and a 13" glider printed on two separate pages. There is no sufficient overlap for joining the pages and so their union has been created butting them together.

Halcyon by C. Williams

28" Span Rubber Model. Sketch and instructions

[Document Page: 10](#)

15" Stick rubber (Full size) by F. Woolliscroft

Union page added

[Document Page: 26](#)

13" Glider (Full size) by W. Drew

Union page added

[Document Page: 31](#)

15" Stick Model & 13" Glider Union page

[Document Page: 58](#)



