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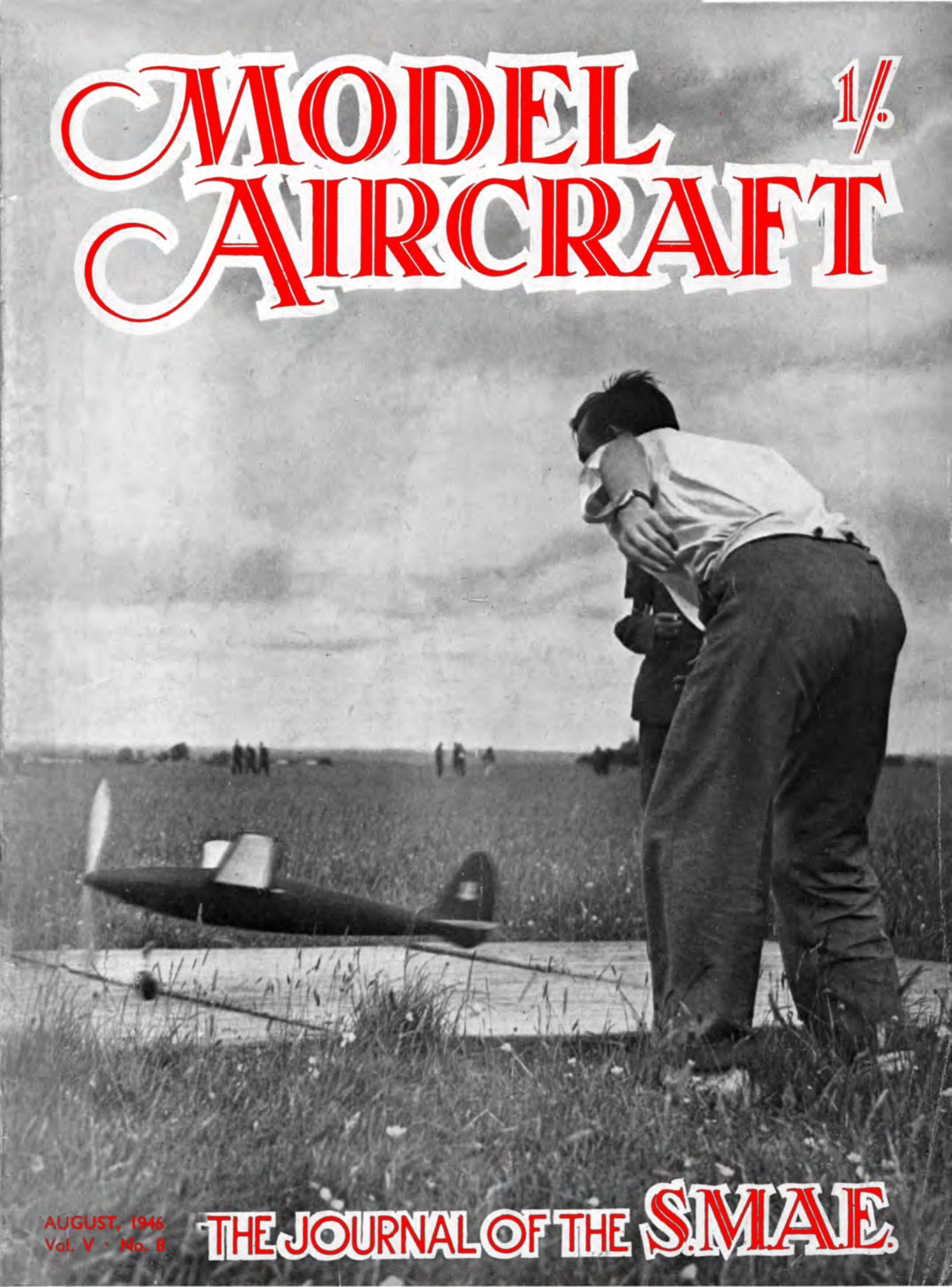

AUGUST, 1946
Vol. V · No. 8

THE JOURNAL OF THE S.M.A.E.

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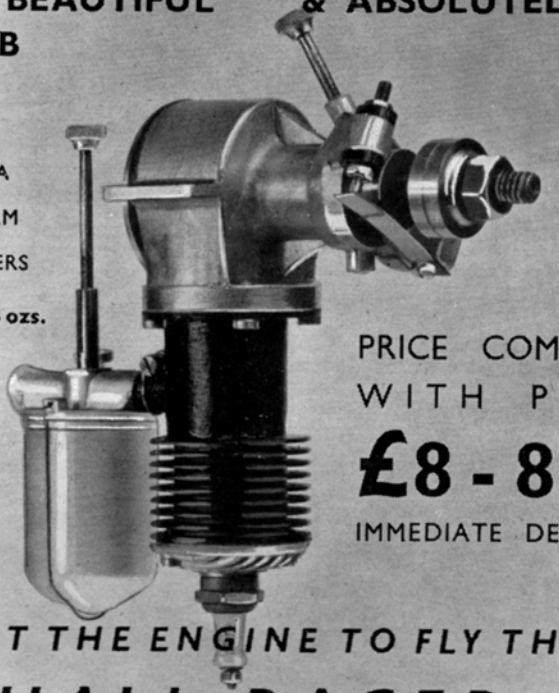

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MODEL AIRCRAFT

The Journal of the Society of Model Aeronautical Engineers

AUGUST 1946
Volume 5. No. 8

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Edited by
A. F. HOULBERG, A.F.R.Ae.S.

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The Editor presents

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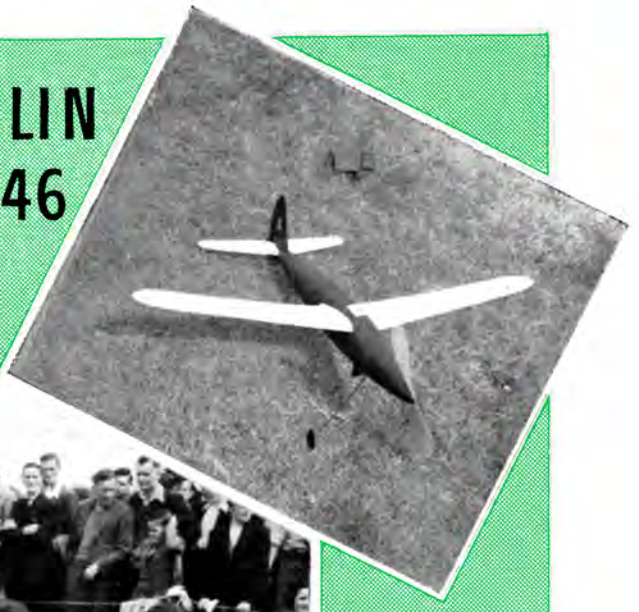
DUBLIN 1946



The Irish National Contest produced some good flying, particularly on the part of Dr. Hal. Charles, of Dublin, and R. Copland, of the S.M.A.E. The left-hand upper picture shows Dr. Charles starting up one of the two models which he entered in the petrol section, and top right-hand picture shows Bob Copland's winning machine in the Wakefield model section. Note the parachute dethermaliser trailing on the grass.
Our centre picture shows the hub of the organisation—the control table—which was largely responsible for the success of the meeting. Reading from left to right are Mrs. Charles, the Chief Timekeeper ; Mrs. B. L. Stewart, Recorder ; and Mr. G. S. Row, the Secretary and Controller..
The two lower pictures are general views of the competitors' pens, which give a good impression of the attendance.

Photos. by your Editor.

News Review

Cover Story

Our cover this month displays a good example of correct take-off technique with a rubber-powered model and shows Bob Copland's Wakefield Model taking-off on the flight which established Bob as the winner of the Irish Nationals Contest for this class of model at the recent meeting at Dublin.

Apart from the excellence of this take-off, and the subsequent perfect performance of the machine during the flight, Bob Copland again proved that he is our leading exponent of contest flying, and his masterly handling of his machine was the deciding factor of the contest. The dethermaliser was set for eight minutes on the first flight, and brought the machine down according to arrangements some three miles away to gain the substantial lead which Bob easily maintained on his subsequent flights.

The photograph was taken by your Editor, and it gives a good impression of the 8/10ths. cloud conditions existing during the contest.

"The Model Engineer" Exhibition

The Model Engineer Exhibition will be opening its doors to the public soon after the appearance of this issue, and we look forward to meeting many model aircraft enthusiasts during the period it will be open. It offers all interested in model making an unrivalled opportunity of seeing the very latest designs and the best examples of workmanship in every sphere of modelling.

It will be opened on August 22nd, and will remain open until August 31st, from 11 a.m. to 9 p.m., the price of admission being 2s. 3d.

There is every indication that it will be the most comprehensive exhibition of models ever held, and will be well worthy of a visit.

The R.A.E. Display

The Royal Aircraft Establishment are to be congratulated for the manner in which they are placing before those sections of the community directly interested, up-to-date information on the latest aircraft developments, both commercial and technical.

A series of special displays were staged by them at Farnborough over the last few days of June, where all the latest commercial aircraft were on view and giving flying demonstrations. This type of educational display does a great deal of good and enables prospective operators to decide on the right type of machine for their particular requirements by direct comparison.

In addition, some of the latest Service machines were on display, such as the "Spiteful," the "Seafire," the "Martin-Baker," with contra-rotating propellers and the two jet fighters, the "Vampire" and the "Meteor," of course. But even the stupendous performance feats of the jet fighters were overshadowed by the pilot of the huge Short Flying Boat, who handled his charge in almost acrobatic fashion, making vertical banked turns and finally flying straight down the runway barely 12 ft. off the ground—a truly awe-inspiring sight.

The demonstrations included a comprehensive static display of the latest internal-combustion and jet units, auxiliary equipment, ejector seats, high-speed experiments, combustion experiments, inspection devices, clothing developments and research developments, all of which were a most valuable contribution.

British Win in Irish Nationals

The Irish Nationals proved to be a well organised and efficiently run contest and the British Model Aircraft enthusiasts who made the journey to Dublin were given an extremely warm welcome and thoroughly well entertained.

The contests themselves turned out to be a triumph for the S.M.A.E., as both of the eliminating contests sponsored by the A.B.A. were won by S.M.A.E. members, and in the actual event, the principal contest, that for Wakefield machines, was won by Bob Copland of the Northern Heights Club, with some magnificent flying on behalf of the S.M.A.E.

Second and third places were also taken by S.M.A.E. members. R. A. Hinks, of the Luton and District M.A.S., taking second place, and Ron Calvert, of the Bradford M.A.C., coming in third.

The British entrants in the petrol contest did not fare so well, and it was obvious that more practice with the "duration on limited engine run" type of contest is needed by our petrol enthusiasts in order to hold their own with overseas competitors. It was also obvious that the Irish boys had access to some better American engines than have been obtainable in this country during and since the war.

The petrol contest was won by Dr. Hal. Charles of Dublin, and this was a well-deserved

win, not only on account of some excellent and consistent flying by the Doctor, but as a fitting reward for the hard work which both he and Mrs. Charles put into the task of entertaining the visitors, particularly with regard to their "spiritual" needs. Nothing appeared to be too much trouble, and the Charles household was a home-from-home to all.

Third place in the petrol contest was taken by that well-known S.M.A.E. member, Trevor London, of the Bradford Club, who substituted for Silvio Lanfranchi, owing to the latter's absence in Switzerland at the time.

R. Copland and K. Tansley demonstrated that their models were capable of holding their own in the best of company, and with a little more luck might well have been placed amongst the winners.

The Model Aeronautics Council of Ireland are keen to make their national contests international events from now on, and we feel sure that British aeromodellists will co-operate by regular attendance in future.

Thanks are due to William Brazier and his cousin Vera for their share in looking after the "material" needs of the visitors, to which they devoted a considerable amount of time and trouble, and to the organiser of the contest, G. S. Row, who worked indefatigably in the background to make the event a success.

De Havillands go Tail-less

The latest concern to make serious incursions in the solution of the tail-less aircraft problem is the De Havilland concern whose jet-propelled "Swallow" tail-less machine is now off the secret list.

This machine, which bears a close family resemblance to the "Vampire" shorn of its tail booms, follows previous conceptions of tail-less machines with control by elevons and a fin and rudder mounted centrally above the jet efflux pipe. It has two features of interest to modellers; firstly, it is provided on each wing tip with containers housing parachutes, which can be released by the pilot should he get into difficulties; secondly, the outer span of the wing is fitted with leading edge slots to improve the stability characteristics at low flying speeds.

The parachute has been in use in full size aircraft for some time as a device for pulling a machine out of uncontrollable spins, but this is the first example of two being employed. With the experience we have obtained recently with models having dethermalisers of this type, one does not envy the pilot who finds, on emergency, that one of the chutes will not open, especially as this particular machine has a cruising speed in the neighbourhood of 550 miles per hour.

No mention is made of synchronisation of the ejection of the two parachutes.

Another feature of special interest to modellers is that this machine is in the nature of a large scale experiment for use in the development of a much larger De Havilland jet-propelled civil project mentioned in last month's issue under "Jet Developments."

The model is a full size scale model in fact.

The Bowden Trophy Contest

The Bowden Trophy will be held on August 4th, at Heston Airport, London, starting at 12 noon, prompt. By kind permission of The Ministry of Civil Aviation, The Ministry of Supply, and the Fairey Aviation Co. Ltd.

Admission will be by the presentation of a membership card of any club or organisation concerned with aircraft, either model or full-sized, and any members of the A.T.C. in uniform will also be admitted free.

Heston Airport is easily reached from Hounslow West Station on the Piccadilly Line, and thence by 98 bus to the Berkeley Arms on the Bath Road. A short walk from here down Cranford Avenue, bearing right into the High Street and right at the Queen's Head into Cranford Lane brings one to the airport entrance.

Petty Pilfering

It is regrettable to learn from the manufacturers of "Frog" model aircraft that one of their experimental auto-ignition engines was removed from the vicinity of their car at the Northern Heights Rally at Langley Aerodrome.

Investigation indicates that the engine was taken from their "camp" some time after 6 p.m., and the person who has "borrowed" it is requested to return it immediately, as its loss is seriously interfering with the development of this type of engine by this concern.

Will all model aircraft enthusiasts please keep an eye open for this engine. It is easily distinguishable from the fact that the cylinder barrel is devoid of fins, but otherwise similar to the "175" petrol engine which has been advertised by Frog's lately, except that it has a short compression adjusting lever and screw in place of the sparking-plug of the petrol engine.

If it is located, will the finder communicate immediately with International Model Aircraft Ltd., telephone LIBerty 1041.

WAKEFIELD MODELS

by R.N. BULLOCK

(Continued from page 162)

ON odd occasions in the past, models have got into Wakefield teams on one thermal flight, when really they could not have beaten 120 sec. in the evening or under similar conditions ; this is the luck of the game, but should be guarded against if possible.

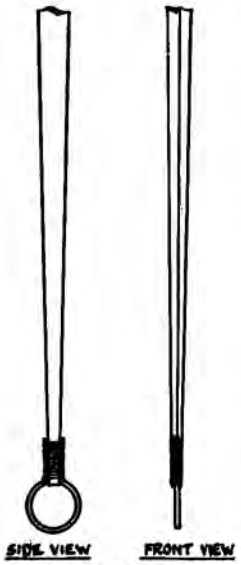


Fig. 1.
A simplified type of undercarriage suggested by the author. While it may be efficient aerodynamically it is not attractive in appearance and at a disadvantage on rough take-off surfaces.

Having given an approximation of possible performance in our last issue, which, no doubt, has been exceeded by a few of the best designers since 1939, I will deal with each part in turn, and try to show what is required for maximum efficiency.

Let us consider the fuselage. A fair size lies between 34 in. and 38 in., and for myself, I favour 36 in. overall.

The shape of the fuselage at the maximum cross-section can be elliptical, circular, rectangular, or rectangular with hemispherical top and bottom, diamond, square, or triangular ; any one of these is a matter of choice depending on your building ability and your ideas of how you can best use your material. There is now little doubt about which shape to use, as the aerodynamic experts and the practical flyers agree that the ellipse is the best, with the circle as a good second, since this is economical in weight, and lends itself better than any other shape to getting good continuous lines from spinner to tail end without difficulty.

The elliptical fuselage is a little more difficult with regard to spinner fairing, and the arrangement of its geometry when being

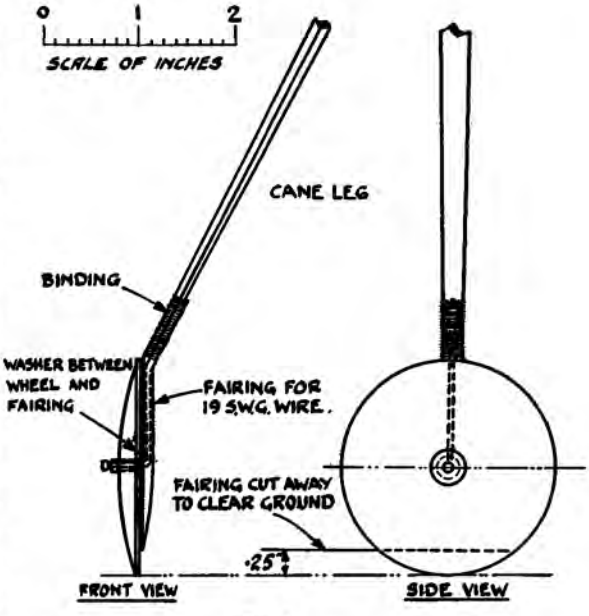


Fig. 2.
This scheme for fairing off the end of the undercarriage leg is an interesting new conception for overcoming the problem of parasite resistance or interference between the leg and the wheel.

designed, but, if well designed and constructed, can be quite light and strong, giving, without doubt, the lowest drag when flown at high angles of attack, unless, of course, a pear section is used; this, however, would only be better than the ellipse when on the climb and would have to be used inverted to equal the ellipse on the glide. There is one rather serious difficulty with elliptical-section fuselages, and this is the rather narrow shoulder width for spar boxes, unless the boxes are brought well outside the fuselage lines and built to form stub roots of aerofoil section or contained in the root fillets. From this you will gather that I believe in fixed wings, and by now I think it has been thoroughly proved that shoulder wings pushed into boxes cannot be beaten for all round efficiency, and nearly all modern high performance Wakefield models have this feature.

The position of the maximum cross-section of a fuselage is important, and should be between 25 and 35 per cent. of its total length from the front end, or, so say the tests, R. & Ms., and experts, but at the low speed at which our models fly there is every indication that about one-third of the total length from the front end is best. If, however, you wish to fatten the front end, or move the maximum cross-section aft, in an endeavour to arrange for the retraction of the under-carriage, do so, as it would not affect the fuselage drag to any great extent, particularly if you arrange the change in shape by a gradual curve, as it appears that it is sharp changes or humps on the surface that matter. Having decided on an elliptical fuselage with fixed wings at shoulder position, the next point that can be considered in connection with the fuselage is the under-carriage.

The under-carriage can take many forms, but the very best thing to do would be to have one which only occupied a position causing resistance during the period of take-off and landing ; all the rest of the flying time it is a serious disadvantage, and it would be of great benefit to the model if it could be retracted.

So now we come to the first, and possibly the greatest, increase in performance that can be expected from any special device. The problem of successful under-carriage retraction on models has been attempted by quite a number of people in the past, a Mr. Henry actually succeeded on two different models as long ago as 1930, but, alas, the models lacked the other essentials to success.

I have made several attempts to solve this problem, but have not succeeded, and I fully realise how difficult it is, particularly to do it without increasing the weight of the model, altering its trim, or decreasing its stability. Though I have failed so far myself, I would strongly recommend an attack on this problem to anyone who has the necessary vigour and ability, for when this is well done it will repay the designer's effort with an appreciable increase in the number of seconds, both on the way up and down, and will be well worth the effort.

The best fuselage construction found so far takes the form of a multi-stringer and wound-former structure, with balsa fillings between the stringers at highly stressed and attachment points. If the stringers are not cut into the formers, which, to me, would be a mistake, the structure round the formers should be brought to the level of the top of the stringers with small filling pieces between each and every stringer on all formers; this is important, as it is only by this method that the paper skin can be arranged in bays of satisfactory size and shape to enable it to hold the fuselage rigid against the severe torsional stress set up by the motor when fully wound up.

The stringers should be 3/32-in. square when sixteen are used, and $\frac{1}{16}$-in. square when thirty-two are used; in the case of the 3/32-in. square stringers, these should be tapered towards the rear end by sanding to $\frac{1}{16}$-in. square at the rear, over about half the total length.

From what one can see of past Wakefield models, it does not appear to be wise to build either a planked monocoque, or carved fuselage, even with the very lightest balsa, as the weight will never repay the problematical gain from the surface smoothness.

Returning to under-carriages, gains from other means than retraction into the fuselage or wings are possible by using plain cane legs with a simple wire loop bound on the end, as in Fig. 1 of the illustrations.

This type of under-carriage will suffice for take-off from hard ground or smooth take-off board if the model is fully wound, but is more likely to cause a nose over on landing.

Another way is to use very small wheels, and yet another is to have wheels designed and fitted as shown in illustration, Fig. 2.

(Continued on page 191)

LONGITUDINAL STABILITY

P. R. PAYNE

(*Continued from page 177, July issue*)

THE last step in this calculation is the adding together of both moments and the plotting of the result against wing angle of attack. (*Note.*—Angle of disturbance is purely relative, so we might as well use this angle as the one between the centre line and the direction of flight.) The resultant curve is shown by a continuous line in Fig. 4, and it is obvious that the model is stable over most of the range, but only slightly so. Between −3° and −1° it is definitely unstable, although this is not serious over such a small range.

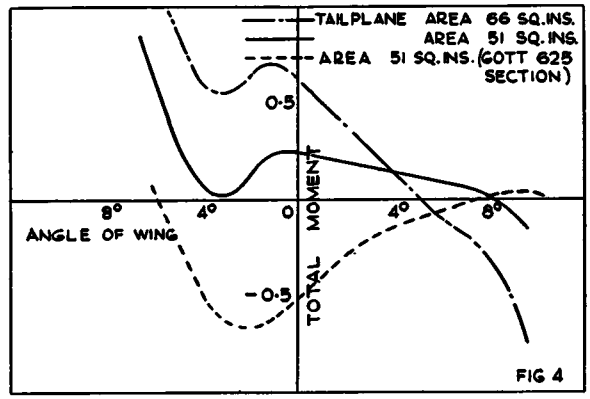


FIG 4

Referring to the table of generalisations at the beginning of this article, we see that we can increase the degree of stability by decreasing the angle of attack of the tailplane and/or increasing its area. The result of a new set of calculations for a reduction of 1° in the former, and an area increase to 61 sq. in. is shown by the chain line—a very great improvement.

The result of using a high-lift tailplane section is shown by the third curve, and is very interesting because of the way in which it bears out what practical modellers have been saying for a long time—it is very unstable from angles of −2° upwards. It is also interesting to note, whilst on this subject, that all my work has so far revealed the flat plate to be the best stabiliser section for small and medium sized models, with a thin symmetrical section as a good runner-up. A curved plate is better than both for positive angles of disturbance, but, unfortunately, is poor for negative angles.

The results are in all cases a little pessimistic, because they do not take into account the stabilising effect of the fuselage. For slabsiders particularly, this is quite appreciable, but as the error is on the right side, there is no need to apply a correction.

This then, is the method for determining whether or not your projected machine will be stable. In conclusion, however, I would point out that it is possible for a model to be statically stable, but dynamically unstable. This can be avoided by following rule (*e*) given at the beginning of this article—keep the tail unit as light as possible.

While all this appears to involve a lot of calculation and work I think readers will agree that it is well worth while. Anything which will enable us to design our models with the certainty that they will perform in a satisfactory manner and in the way we desire them to is a step in the right direction.

TABLE II.

1	2	3	4	5	6	7
α Wing	Downwash Angle ϵ°	θ° Tailplane	α Tailplane	C_L Tail	$C_{LT} \times y$	$C_{LT} y \times k$
−6.3°	0°	−2.5	−2.5°	−0.165	+2.932	+0.746
−3.37°	1.75°	+0.43°	−1.32°	−0.08	1.44	0.367
−1.47°	3.5°	2.33°	−1.17°	−0.07	1.26	0.321
+2.8°	5.25°	6.6°	+1.35°	+0.085	−1.53	−0.39
5.9°	7.0°	9.7°	2.7°	0.175	−3.15	−0.803
7.7°	7.87°	11.5°	3.63°	0.24	−4.32	−1.1
9.6°	8.5°	13.4°	4.9°	0.325	−5.84	−1.49

"Tune it up" says ROBIN BANKS

THE motor-cycling enthusiast knows that for safety's sake he must overhaul his machine periodically—preferably before every long journey. A quick run over the whole machine, tightening a loose nut here or a loose connection somewhere else, in short, a general *tuning-up*, gives our friend with the motor-cycle the knowledge that this task, although it takes only a few minutes each morning, may save a really nasty and expensive mishap a little later. When a check is made every morning, it takes a few minutes or even only seconds. When left for weeks, the tuning-up may take a day or more.

Like the motor-cycle, the model aeroplane requires looking after, if it is to be at its best. Whereas, however, a motor-cycle will carry on for some time without attention, merely storing up the trouble, a model aeroplane produces trouble straight away. If everything is not O.K.—you've had it, and so has the model. Many an elegant model has come to grief through a happy-go-lucky assemblage of components, removed from the carrying box and slung together at high speed. The gaiety of the heavenwards launch so often changes to dismay when the fateful cavortings of the model take place. The whole business is so expensive!

The cure, safety measure—or what you will—lies in a simple but methodical check over before each flight. It is necessary before every flight, because it is almost certain that something will have shifted in the stresses resulting from the previous landing. In order not to miss anything, the logical way to examine the model is from one extremity to the other, and my own method is to start from the nose and work to the tail. Before the actual tuning-up routine, which naturally takes place on the flying field, a complementary process should be used before packing the model and leaving home. This consists of making sure that no little repair or adjustment is left for rectification that could be better seen to at home. Any soldering or wire-bending, for instance, is difficult to carry out satisfactorily on the field.

Let us imagine we are just off for our day's flying. We have seen to the little points above, have packed our model carefully away in the box, and are all ready to go to the flying field.

Here we are—and a fine day, too! Ideal for our little bus—but wait! The whole point is that we must not be impatient. *Tuning comes first* must be the golden rule. Off with the lid of the box then and out with the contents.

First of all, we must assemble the model, and deal with any obvious fault or breakage. This, unfortunately, is so often where the impatient flyer stops. This, however, is where we should start. Sticking to our routine, we look at the nose first. The propeller (absurd as this may seem), *make sure you have it on the right way round*, and not producing reversed thrust. This has been known to happen and cause much consternation. One look, however, reassures us. We are O.K. How does the free-wheel? If not, adjust it accordingly. No trouble here, that's good! We'll try putting about fifty turns on the motor and watching the propeller as it turns. No wobble here, so we haven't a bent shaft. A drop of machine oil, though, will probably improve its freeness of running. Yes, that's better. We'll hold the model at arm's-length to test the working of the free-wheel clutch, swinging round to see if the propeller declutches all right. O.K. again. Well, nothing wrong here, so now we'll examine the fuselage. Before we do that, remember to test the hinge if you have a folding propeller and make sure it all works easily.

The noseblock, now, I think. Where's that downthrust packing got to? Here it is, slipped inside. We'll glue it on this time, as we know it's the right amount. What's that you say? "Lucky we noticed it?" Not at all. You can't miss a thing like that when you check systematically. Is the rubber hook properly covered with valve-tubing or flex? Don't want a motor cut through. Oh, yes, of course, we've fitted bobbins—better still. The motor is not sagging either; we have to be careful of that, for it leads to instability, apart from soaking the fuselage with rubber lube! Let's try the spacers all along the fuselage; they should all be nice and firm. Very often the butt joint between a spacer and a longeron gives way, and the spacer is held in place only by the tissue, which is dangerous. You can test for it by exerting slight pressure with your thumb, but don't overdo it.

We'd better mend those tears in the tissue, they are unsightly and only add extra drag. Run a thin film of cement along the edges of each tear; it will make quite a neat repair. The dowel at the rear should be examined to make sure the pull of the motor has not loosened it a little. Take it out and we'll run a thin film of cement over it. That's the idea. Wait till it's dry and then replace it—you'll find it fits all right.

Now for the undercarriage! Are those wheels running true? They seem all right, but with this celluloid type it pays to make sure the hubs aren't split. O.K. again. Don't forget the wheels must be parallel and pointing straight ahead, and that the retaining washer on the end of the axle must be soldered firmly, and not splayed in and out at odd angles. See, too, that the model sits horizontally on the undercarriage legs, which must, of course, be of equal length. Lastly, we'll check up the springing, especially any soldered joints.

Fine—and now for the wings! Patch any tears in the tissue first, and then we'll check that each wing panel has equal dihedral, and that we haven't developed any warps. The incidence is correct, I see, but I wonder if those rubber bands are strong enough to hold everything while the model is under the strain of flying. They feel all right, anyhow, and now we've checked that the wing is in the right position for best glide and the rubber bands seem to be holding out quite satisfactorily and firmly. This is important, as we don't want a wing to shift while the model is flying. The wing must be resting solidly on the fuselage, and the centre line of the wing must be dead in line with the centre line of the fuselage, not at an angle to it. All therefore appears as it should be.

We are now left only with the tail. The fin must be firm and vertical and trimmed to the angle required. We'll take a look to make sure the tailplane is perfectly horizontal and lined up with the wings—few things give rise to more peculiar behaviour than a tailplane which, when viewed from the front, looks as if it has been used as a see-saw. Make sure, then, and check that it is not pointing right or left at an angle to the fuselage. All that now remains is to check that the incidence packing is firmly glued in place, and see the rubber attachment bands are strong enough; nothing can have a worse result than a tailplane coming adrift—unless it's a wing!

Well, that's all you have to do. Your inspection is over—it hasn't taken half the time you've spent reading about it, and you have the satisfaction of knowing the odds are a hundred to one against any ordinary mishap, and if one does happen—well, you have done everything you could to prevent it. There you are then—next time, *tune it up first.*

WAKEFIELD MODELS

(*Continued from page 188*)

This reduces the interference between the wheel and the leg to a minimum, but is likely to get jammed if used on grass.

There is a fairly simple form of retraction to be got, with a layout where the model is carried at the front on a single leg and small wheel, this leg to be retracted forwards and upwards, the rear end of the model being carried on two small stubs on the tips of the tailplane, but this necessitates fitting the tail-plane low. Mr. Norman Lees has developed a successful single-leg retracting undercarriage which he uses to counter the shift of the centre of gravity due to the folding propeller blades, but this only retracts at the end of the power run. My own choice is still a plain two legs well fixed into paper tubes internally braced, but I have a strong fancy to attempt the new wheel arrangement shown in Fig. 2.

Norman Lees with his Payload Wakefield which incorporates a forward-retracting undercarriage operated by the tensioning device so that the forward shift of the centre of gravity counterbalances the rearward shift due to the folding propeller. The undercarriage is of the single leg type, hence the two stub fins on the tail to give three point support for take-off.

Duration Contests for Power-driven Model Aircraft

G. W. W. HARRIS

AUTHOR'S NOTE : *For the purpose of this article we will assume the word "Power" refers to any source of power other than that produced by rubber motors.*

I WAS inspired to write this article after attending the Council meetings of the S.M.A.E. held at Blackpool this year. One of the leading items for discussion were the rules and regulations governing power-driven model aircraft contests and the possibilities of holding duration contests. The Midland and Northern club representatives were particularly keen on a duration contest being fitted into this season's calendar of events. So the power group, who were present, were duly commissioned to see how best such a contest could be regulated to suit the prevailing conditions.

Now there will be many who will raise their eyebrows at the decision to hold a duration contest for power-driven aircraft; quite rightly, they will ask about the possible dangers of power-driven aircraft making long flights, and will probably cite instances of "close shaves" in the past, and of petrol-driven models getting lost. In fact, there will be quite a number of diverse queries. Let us then, without bias, consider the position by enumerating the chief points that may be held up for criticism and question.

(*a*) Would a duration contest be a source of danger to the public and their property?

(*b*) Would duration contests introduce freak aircraft?

(*c*) Would structural and aerodynamic design improve in any respects?

(*d*) Would power plant design benefit?

There are, of course, a number of side issues to these four points, such as in the case of (*b*) when automatically we enter into the eternal question of what exactly is a freak? More of this anon. Point (*a*). It is difficult to see any reason why a duration contest would involve any more danger than say a "Precision" contest such as the Hamley Trophy event, provided the maximum motor run allowed did not exceed, say, 20 seconds. Past experience shows that the resulting glide would not be excessive. Further, wing loadings would tend to be on the low side, thus the all up weights would be somewhat lower than the average precision contest type of model of the present time—for a given engine rating. Admittedly, such aircraft will be required to climb more rapidly, but one cannot see danger in that—it's the descending that can cause bother; however, here again, the duration job glides slowly AND FLATLY. Obviously, the maximum motor run times will have to be compatable with progress and geographical limitations. We must not overlook the advances made in recent years in the matter of dethermalisers; already several petrol model enthusiasts in this country are actively using them in their latest models. In America, of course, they are accepted practice.

On considering points *b*, *c*, and *d*, I find them quite closely related, inasmuch that the possible

(*Continued on page 199*)

The De Havilland "Dove"

PERHAPS one of the best looking post-war aircraft, the De Havilland D.H. 104 "Dove," is already living up to its good looks by sound service.

Ease of maintenance and operational facility, together with passenger comfort has been the keynote of the design. It is interesting to note that the "Dove" can carry more pay-load than was at first estimated. The gross weight has been raised from 8,000 lbs. to 8,500 lbs. She is intended for light, fast feeder-line work with a range of 200-300 miles, carrying a pay-load of between eight and eleven passengers, plus their luggage at an economical cruising speed of 160 m.p.h.

The low-wing layout ensures a light rigid undercarriage and affords a considerable amount of protection in the event of a belly landing. The wing is a single spar structure and of fairly thick section.

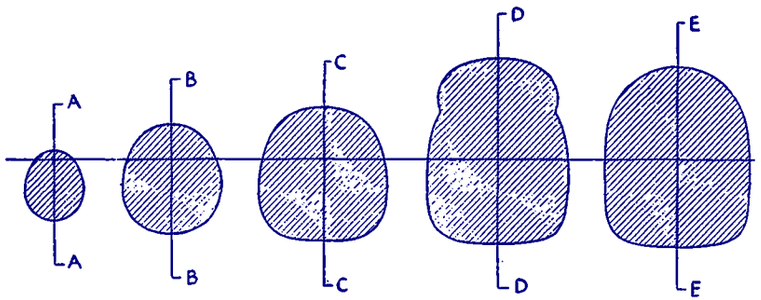
The all-metal wings are of Piercy Aerofoil section, the chord at the root being 8.66 ft. and at the tip 2.62 ft. The angle of incidence is 2 deg. (chord to fuselage datum).

The tricycle undercarriage ensures good ground stability in cross-wind take-offs and landings and makes entry and exit for the passenger much more comfortable, being on an even keel. The fuselage has a maximum width of 4 ft. 6 in. and a maximum height of 5 ft. 2½ in. It is of all-metal construction with stressed skin, the outside surfaces being burnished. The cabin is air-conditioned and is 11 ft. 9 in. long. It is well sound proofed. The cockpit has side by side seating and is fitted with blind flying panel and all the latest wireless aids to navigation.

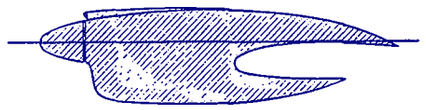
The Gipsy Queen 71 geared, supercharged motors, have direct fuel injection. The airscrews are fully feathering and reversible for braking on ground manoeuvring. The undercarriage, flaps and brakes are actuated on the "Hymatic" system.

Maximum level speed at 5,800 ft. is 222 m.p.h. Rate of climb at sea-level, 750 ft./min. Service ceiling 18,500 ft.

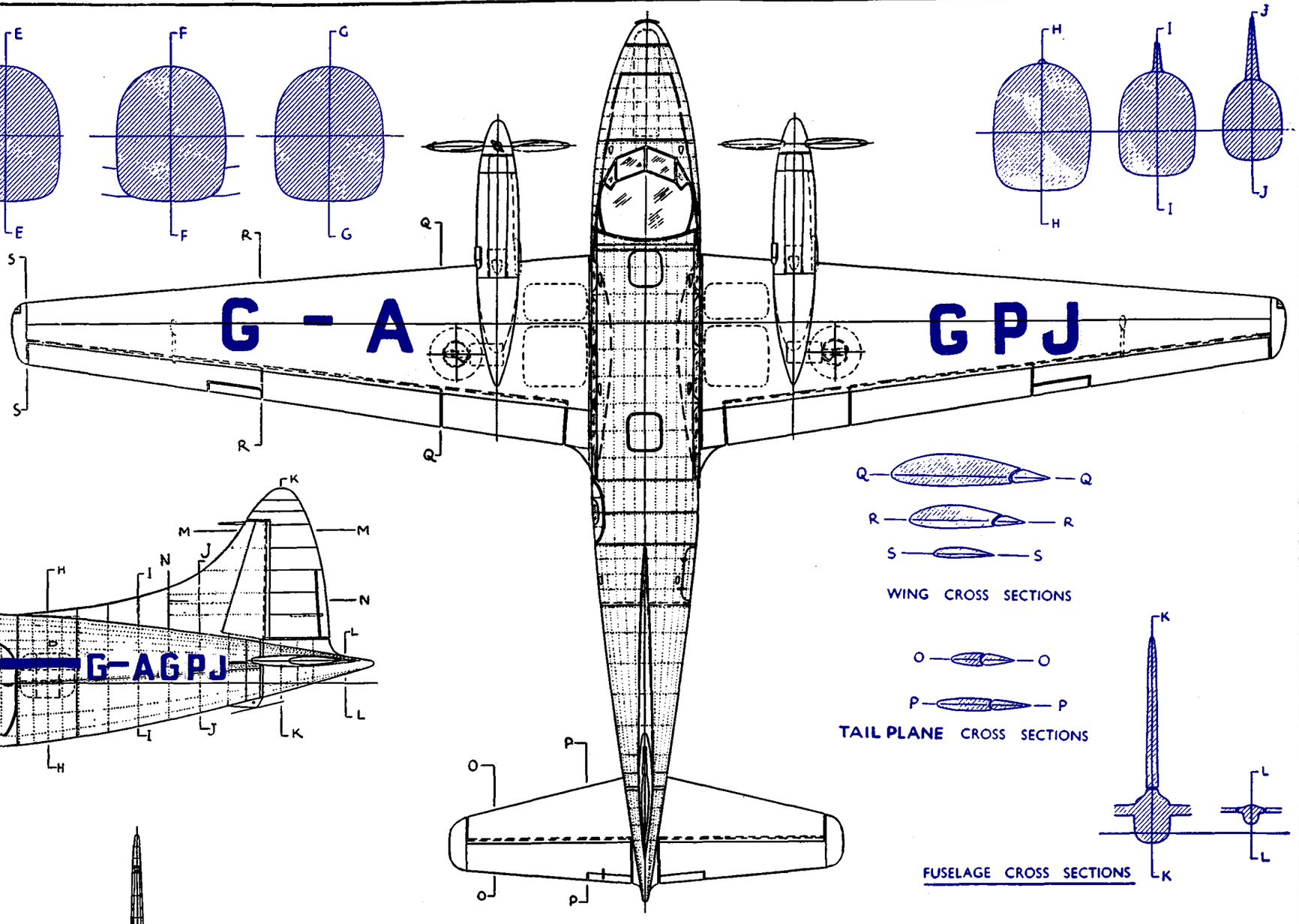
THE DE HAVILLAND D.H. 104 "DOVE" LIGHT FEEDER-LINE PASSENGER AND TRANSPORT AIRCRAFT



FUSELAGE CROSS SECTIONS



ENGINE CROSS SECTION
(SIDE ELEVATION)

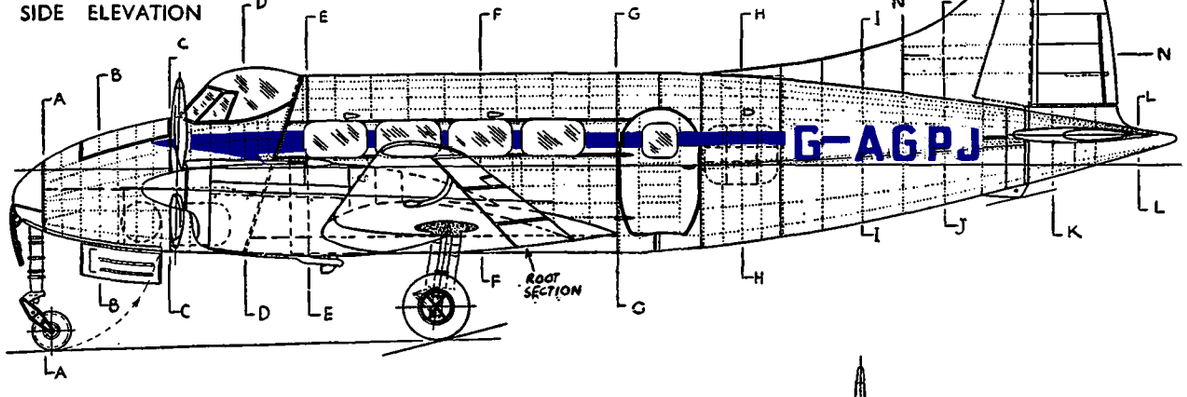


WING CROSS SECTIONS

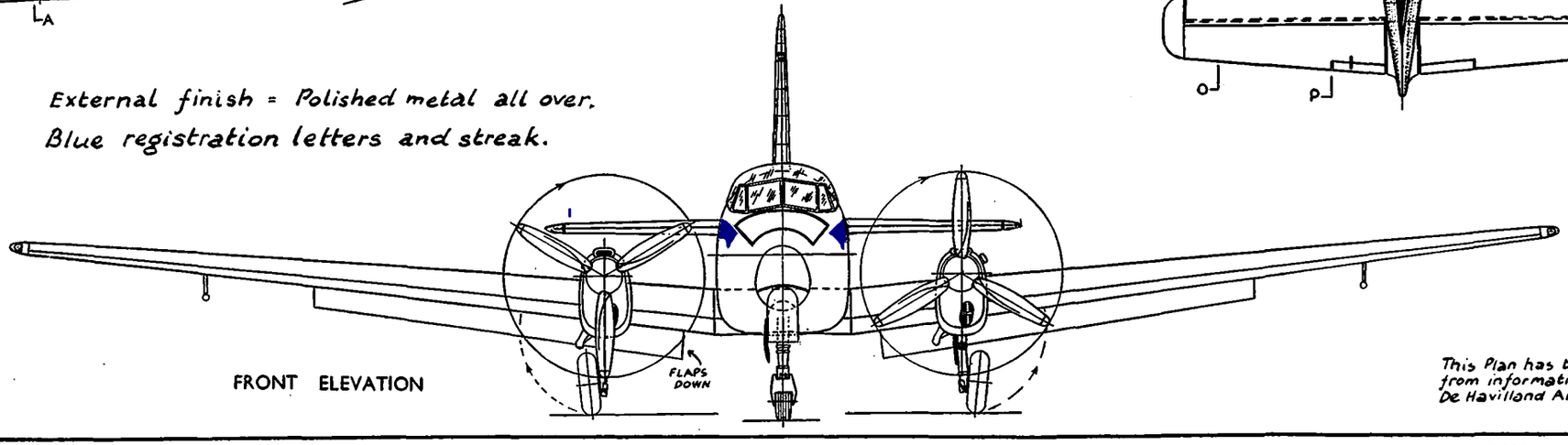
TAIL PLANE CROSS SECTIONS

FUSELAGE CROSS SECTIONS

SIDE ELEVATION



External finish = Polished metal all over.
Blue registration letters and streak.



FRONT ELEVATION

FIN
CROSS SECTIONS

DRAUGHTSMAN
C.B. DUN
546

This Plan has been prepared from information supplied by De Havilland Aircraft Co Ltd.

Scale 6 feet to 1 inch

Span : 57 ft. Length : 39 ft. 4 in. Height : 13 ft. Powered by two de Havilland Gipsy Queen 71, super-charged geared motors of 330 h.p. each. Crew : 2, Passengers : 8 to 11. De Havilland fully feathering and reversible pitch airscrews for braking purposes. This plan is reproduced from a " Veri-Tru " drawing.

The Northern Heights Rally, held on June 30th, at Langley Aerodrome, proved to be the best attended of the series, and as popular as its predecessors of pre-war days, thanks to the reputation built up in the earlier rallies.

Here is a selection of pictures which gives a cross section of the event, but only covers a small percentage of the activities which took place at this meeting.

The top left picture shows a well-made glider entered by Mr. Smith, of Northampton, rising steadily on the tow line in the glider contest, while the right-hand picture shows some of the glider competitors lined up at the starting point awaiting their turn to take-off. This section of the rally attracted an entry of no less than 268 competitors and was easily the best patronised event of the rally.

NORTHERN HEIGHTS RALLY

The results in detail are to be found in the Northern Heights report, in the Club News section of this issue.

The picture on the right shows the attractive glider belonging to Mr. A. J. Cockrel, of Northampton, in the hands of his youthful helper.

The left-hand picture is an impressive general view of the Concours d'Elegance which drew a good entry and produced some fine examples of workmanship which set the judges a difficult problem. Honours were finally awarded to R. H. Smith, of Wolverhampton, for his beautifully finished petrol model "Mercury IV."

Photos. by your Editor.

Edgar T. Westbury

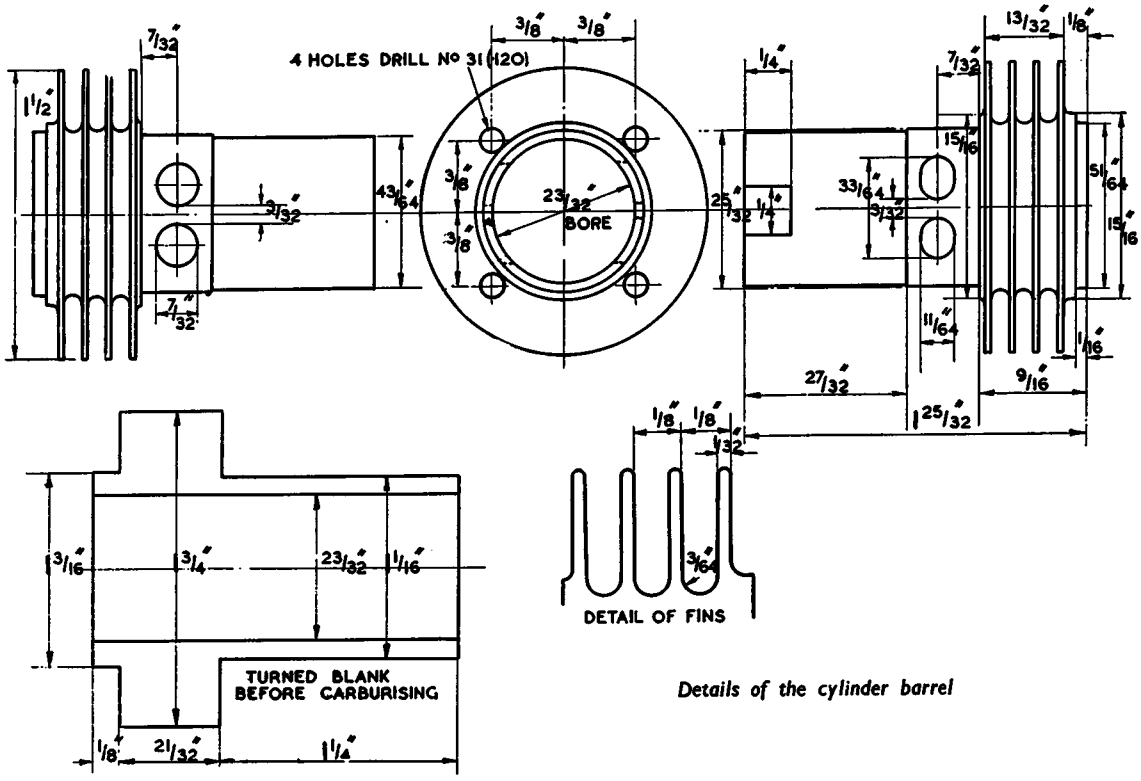
"ATOM MINOR" MARK III

6 c.c. Engine

BEFORE turning the cylinder-head cooling fins it is a good policy to drill and counterbore the holes for the holding-down screws, as if this operation is left till afterwards, there will be a tendency for the drill to run out of truth as it passes through the fins. It will be seen that the counterbore passes through three fins, and is finished flush with the surface of the thickened fin which serves as a bolting flange. The best tool for counterboring, or at least for finishing the flat face, is a spot-facing cutter or " pin drill," and if a ready-made one is not available, this also may be made from silver-steel rod.

To form the fins, a parting-tool 1/16 in. wide should first be used to cut grooves almost to finished depth, after which a finishing tool 3/32 in. wide, with a rounded nose, is used to clean up the sides and bottom of each groove. The tips of the fins are rounded off with a smooth file.

Taps to cut the thread for the sparking plug are available from most tool shops, but screw-cutting in the lathe is not a difficult operation. The top face of the plug boss should be faced cleanly and dead square with the thread.



Details of the cylinder barrel

Cylinder Barrel

This is the most important single component in the engine in respect of accuracy, and every possible care must be taken in machining it. The material recommended, for constructors who wish to avoid the necessity of carburising or other heat-treatment of the bore, is fine-grained cast-iron, preferably die-cast or centrifugally cast in solid or hollow bar form. Should steel be used, it should be either a high-tensile alloy steel, which will be found very difficult to machine, or a mild-steel may be used, which will machine fairly easily, but is not sufficiently hard to produce a really durable surface in the bore unless it is carburised. It is true that many engines have been made with mild-steel cylinders, but their working life is comparatively short, especially when used with ringless pistons which have no accommodation for wear; and the least fault or deficiency in lubrication is liable to lead to serious trouble.

Assuming that mild-steel is used for the cylinder, it is recommended that the treatment applied is such that only the bore is hardened or toughened to resist wear. This may be done by first machining a blank to the dimensions shown in the lower part of the drawing, and carburising it by packing in a closed iron box filled with case-hardening composition, heating the box to a red heat and maintaining this temperature for about an hour. If the usual box as employed for this purpose is not available, it is possible to dispense with it by simply making two large discs or washers to close the ends of the bore, with a bolt to go through the centre and keep them in place; then pack the bore of the cylinder with the case-hardening powder, close up, and heat up the blank as directed above. The blank should be allowed to cool naturally, and the outside is then machined to its finished dimensions, except for the fins, which will remove the carburised "case," leaving the steel in its original soft condition.

If means are available for internally grinding the cylinder, it may be re-heated and quenched out, so as to leave the bore surface glass-hard, which is the nearest approach to the ideal for long wear. But hardening almost invariably introduces some distortion, which is extremely difficult to correct by any other means than grinding, and few amateurs have facilities for carrying out this work. It should also be noted that the material removed by grinding must be allowed for, by leaving the bore about 0.010 in. under size in the initial machining.

The carburised surface, if left unhardened, is a good deal more resistant to wear than untreated mild-steel, and it will be fairly satisfactory to leave it in this condition, finishing the bore surface by lapping with abrasive paste on a soft metal (lead or copper) lap. In this case, no more than about 0.001 in. need be removed in the finishing process, providing that the bore is left as smooth and parallel as possible in machining.

The process of lapping cannot be described here in detail, but it has been dealt with many times in, practical articles in *The Model Engineer* and is also described in the "M.E." handbook "Grinding, Lapping and Honing." It is emphasised that lapping is something more than a mere polishing process, and that mere "finish," as such, is not the most important thing to aim at. Correct methods in lapping will produce accuracy to the very finest possible limits, but it calls for care and patience, and results cannot be obtained by rush tactics.

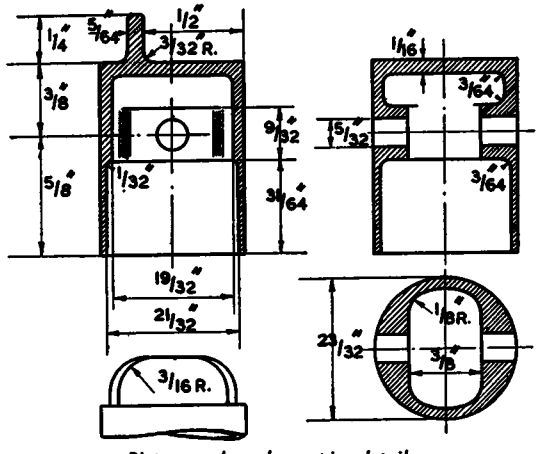
If cast-iron is used for the cylinder, the processes employed are generally the same, including lapping, but with the exception of heat-treatment. The cast-iron cylinder barrel will be rather fragile when finished, and will need careful handling. It may be noted that the lower end of the cylinder skirt, which is shown as 1/64 in. smaller in diameter than the port belt, need, in fact, only be reduced in size just sufficient to slide easily into the crankcase, if it is desired to keep this part as strong as possible. The port belt should be a tight "wringing" fit in the crankcase, so that leakage of air from the crankcase to the exhaust port is avoided.

Before turning the fins, the holes for the cylinder bolts should be drilled, following through from the holes in the cylinder head. The cylinder should be mounted on a mandrel for turning the fins and other final machining of the exterior. It will be seen that the fins are formed similarly to those of the cylinder head, and it may be mentioned that this is not the ideal shape of fin for producing the most effective cooling, but is better than a square-bottomed fin, and will be found generally adequate for a model aircraft engine. If, however, it should be proposed to use the engine in an enclosed position, or for any purpose where the flow of air past it is reduced, a tapered form of cooling fin, both on the cylinder barrel and the head, will be found better.

The cylinder ports are formed by drilled holes, the positions of which are plainly shown on the drawing. It will be seen that the ports

on the transfer side are slightly elongated with a file after drilling. It is permissible to join up the ports to form a single slot, both on the transfer and exhaust sides, which will increase the port area considerably, but this will show very little, if any, advantage at the speeds required for aircraft propulsion, and will reduce the bearing area of the cylinder wall. If a piston fitted with rings is employed, slotting out in this way is not permissible, as it would result in trapping and breaking the rings.

A notch ¼ in. wide by ¼ in. deep is filed in the base of the skirt on the transfer port side, to clear the connecting rod at its point of maximum angularity. After this work is completed, it will be found desirable to give the cylinder a final lapping, to remove burrs and possible distortion caused in cutting the ports.



Piston and gudgeon-pin details

The piston may be made either of cast-iron or suitably treated steel. Aluminium pistons have been tried out in these engines, but owing to their high coefficient of expansion, these need to be fitted with a large clearance, which tends to make engine starting difficult, unless they are equipped with piston rings. Cast-iron pistons generally give the most satisfactory service in small engines, and their greater weight compared with aluminium pistons, makes very little difference at normal running speed. A piece of cast-iron " stick " may be used for machining the piston from the solid—it is hardly practicable to cast it to the finished shape internally—and an ample extra length should be allowed for holding it in the chuck. If the external surface is rough, it should first be turned all over to produce a true cylindrical surface for holding in the chuck.

(To be continued)

Duration Contests for Power-driven Model Aircraft

(Continued from page 192)

answer to (*b*) automatically answers (*c*) and (*d*). Look at this way :—

A good designer and builder of model aircraft is the product of: (*a*) experience gained over a number of years at no little expense of time and money ; (*b*) he invariably possesses a high degree of patience, persistence, and often, because of his enquiring type of mind, is extremely versatile, he knows that the wider his knowledge and the more extensive his practical abilities, the greater will be his success.

Give these amateur designers—there are thousands of them—a design problem to solve or a formula to work to and, if it takes their fancy, watch the results. The winter months give way to spring and the flying season, and there they are, each designer and builder with his answer to the design problem he was set. Each has tackled the problem his own way. The answers to the problem may be diverse, yet give good results. Some of the models, to the eyes of many, will be regarded as being freakish, but, and this is surely the main point, do they perform well, do they extract, with their unorthodox appearance, the last ounce of efficiency, are they based on scientific reasoning? Do they, in fact, excel as the answer for their set purpose? If so, then I submit they are not freaks in the sense of the general implication given to that word.

It is pretty obvious then, that if we accept this outlook for producing power-driven model aircraft for duration, we will have to do some swotting. For the problem introduces quite a number of difficulties.

Structures will have to be light, yet capable of withstanding extremely high loads and English weather. Power units will have to be efficient. Airscrews will have to be designed with a theoretical back-ground, in fact, I think we can safely say that the answer to (*c*) and (*d*) is definitely yes.

ORIGINAL DESIGNING

by

GORDON ALLEN

THE last type of fuselage to be dealt with is that which is designed to carry a wing in the low position.

Fuselage Type 1 (Fig. 1) shows a typical low-wing layout. Due to the position of the wing, the centre of drag and the centre of gravity are lowered (as compared with a high wing) ; therefore the thrust line can be made to coincide with the former. This in itself makes for increased longitudinal stability.

The line of thrust (represented by the datum in the example) is therefore positioned close to the bottom longerons. Consequently, the curve from "E," through "A" to the rear, and representing the fuselage top, will be far more pronounced than the lower fuselage boundary, to give the fuselage a suitable maximum depth.

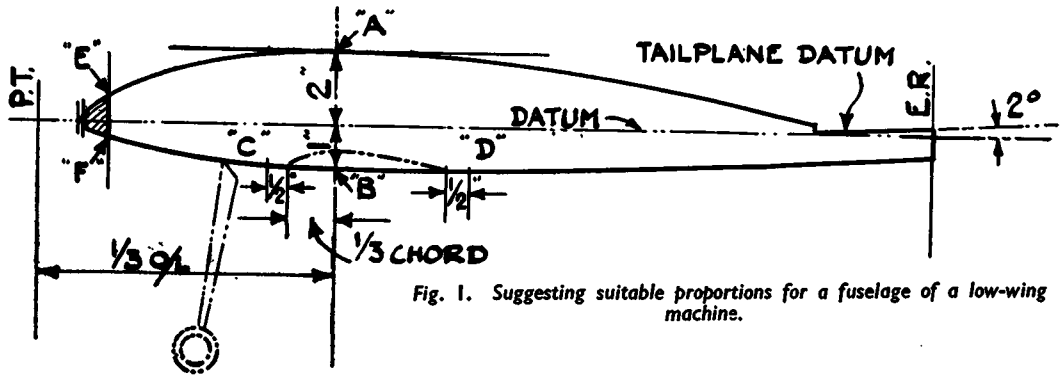


Fig. 1. Suggesting suitable proportions for a fuselage of a low-wing machine.

Care must be taken to see that the layout is not, thereby, made top heavy. Distances of the upper and lower boundaries from the datum must be arranged, as suggested in the sketch.

Low wings generally call for negative incidence on the tailplane. This can be incorporated in the design either by inclining the tailplane datum (as shown) or by packing placed underneath the tailplane.

The line representing the bottom of the fuselage must incorporate a flat (" C " to "D"), the length of which must be the chord, plus 1 in., and it is positioned as shown. This is to allow for adjustment of the wing, the centre section of which is designed to allow the whole unit to clip on to the fuselage from underneath.

Similar flats must be incorporated in the plan view of the fuselage ; otherwise the design procedure remains the same as that described previously.

The layout of fuselage Type 2 (Fig. 2) differs from the previous example in the method of wing fixing. Here the wing is a fixture, being positioned by two fuselage bearer plates. The line from " F " through " B " to the rear can therefore be a continuous curve. The fuselage side plates are made from hard balsa and are located between fuselage uprights. The wing centre section ribs should be cut from these plates to ensure a clean fit on assembly.

Should the undersurface of the airfoil not correspond to the curve of the fuselage bottom, then a fairing must be incorporated beneath the wing centre section to achieve that end.

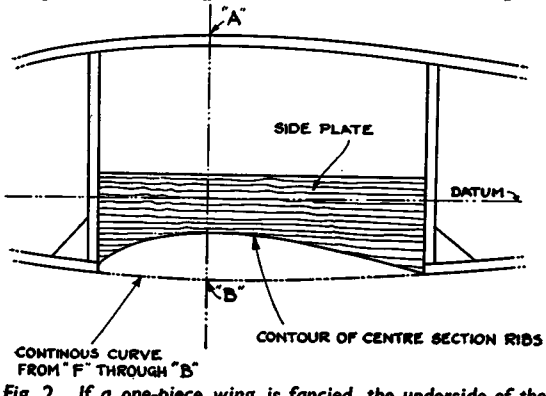


Fig. 2. If a one-piece wing is fancied, the underside of the fuselage can be cut away, as shown, and strengthened with side plates,

If a streamlined low-wing is contemplated, the same design procedure as used on mid-wings (part 3) is adopted, with the exception that the former extensions (to carry the wing-boxes or tongues) must embody a rather marked dihedral angle as compared with other designs. This should be somewhere between 10 and 12 degrees.

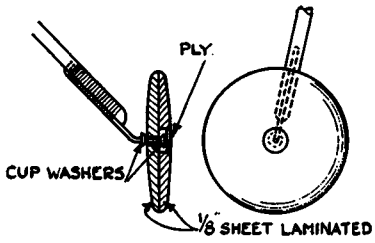


Fig. 3. A method of making wheels with a blind axle to give a smooth and streamlined exterior.

Undercarriages

Due to the creation of drag, an undercart can only be described as an unwelcome necessity. It must be the aim of the designer, therefore, to evolve an arrangement that is light and yet strong enough to withstand the heavy landing and take-off loads imposed upon it. It possesses one asset however, for it can be used to adjust the trim of a model. The position of the undercarriage then is important. It may be an advantage to leave the actual fitting of the unit to the fuselage until all other structure has been completed, when the model can be assembled (in its uncovered state) and the undercart then located to obtain a desired balance. The position of the unit should not be too close to the nose, or take-off will be found difficult, caused by too great a tail leverage. On the other hand, placing the undercarriage too far back will result in a nose-over tendency on take-off. A good position is approximately two inches forward of a line drawn vertically through the leading edge of the wing.

The undercart is indicated in the side view of the fuselage by drawing in the full shape in a provisional position, at the same time allowing sufficient ground clearance for the airscrew. The *true* length of legs will, of course, be greater than shown in side view due to their slope, required to give the unit a suitable wheel track. The latter should be as large as possible to aid ground and take-off stability.

Fig. 3 shows a neat, yet straightforward, method of making a "hubless" wheel and its attachment to an orthodox bamboo or balsa undercarriage leg. The wheel is made from two discs, pieces of hard balsa. The outer lamination is drilled ¼ in. diameter, while the inner disc is bushed with a short piece of 18 s.w.g. aluminium tube.

The axle (18 s.w.g. steel) is then bent to shape to agree with the drawing. (A front view of the undercarriage will be required here showing the correct track and stagger of the legs.) A cup washer is soldered close to the bend radius of the axle, the inner wheel lamination fitted, and a second cup washer soldered in place as shown. The outer wheel disc is then cemented in place and the whole wheel is streamlined. Finally, a piece of millimetre birch ply is fitted into the wheel hub well.

A cantilever type of undercarriage is shown in Fig. 4.

The lever is made first, from light gauge sheet brass, and is drilled to take a piece of brass tube at one end (soldered) and a light tension spring at the other.

This is then fitted over a length of steel wire required to make the support, item "C." The latter is then bent to shape, and, during the process the bearer tubes are located. The whole unit is then mounted on bearer plate "B," made from hard balsa or ply and cemented to the forward face of a fuselage former as indicated. Reinforcement can be fitted over the tubes (in the case of a heavyweight) in the form of struts carried to the rear face of the former immediately in front, and further reinforcement can be provided by binding plate "B" to the former.

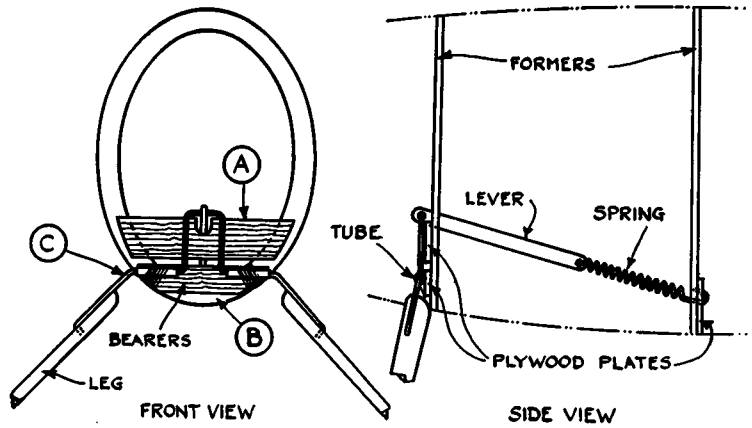


Fig. 4. A suggestion for a sprung undercarriage which has proved successful. Rubber bands can, of course, be used instead of the spring.

Purely Petrol

CLOUD-DOZER

by R. V. BENTLEY

MOTOR unit, fin, dethermaliser, and one or two minor items, are yet required to complete the "Cloud Dozer." The motor unit will vary slightly according to the make of motor used, and the drawing shows the arrangement for the Ohlsson Gold Seal. My original intention to use paper conduits has been abandoned in favour of running connections through the motor-bulkhead by means of 6-B.A. brass screws and nuts, all wiring terminating in terminal tags which are held on the screws, and this arrangement has proved quite good in practice, as there is no passage through which fuel and oil can be driven through to the rear of the motor and into the fuselage. The running of the high tension lead through an aluminium tube has not proved detrimental in any way, as its position is reasonably remote from any other earthed metal parts. A cowling over the motor, although not essential, finishes a model off nicely, and I have had considerable success in the past with built-up paper cowlings, made by carving out a wooden block to the shape required, but $\frac{1}{16}$ in. less all over than the finished cowling size, and building up the cowling over the block with small strips of paper, using clear, full strength dope as the binding medium. The first covering of paper strips should be stuck down to the block with liberal quantities of vaseline in order to ease the removal of the cowling when complete. A paper cowling made in this fashion, about $\frac{1}{16}$ in. thick, is exceptionally strong, and a good final finish can be obtained by continued sanding and doping until all the "'umps and 'ollers" have been sanded away.

The Fin

The fin is made simply from medium hard $\frac{3}{16}$-in. sheet, sanded to airfoil shape, and cemented into a slot cut into the upper sheet balsa covering of the tailplane. The movable trimmer is cut off and re-fixed by means of a thin celluloid hinge as shown.

The Dethermaliser

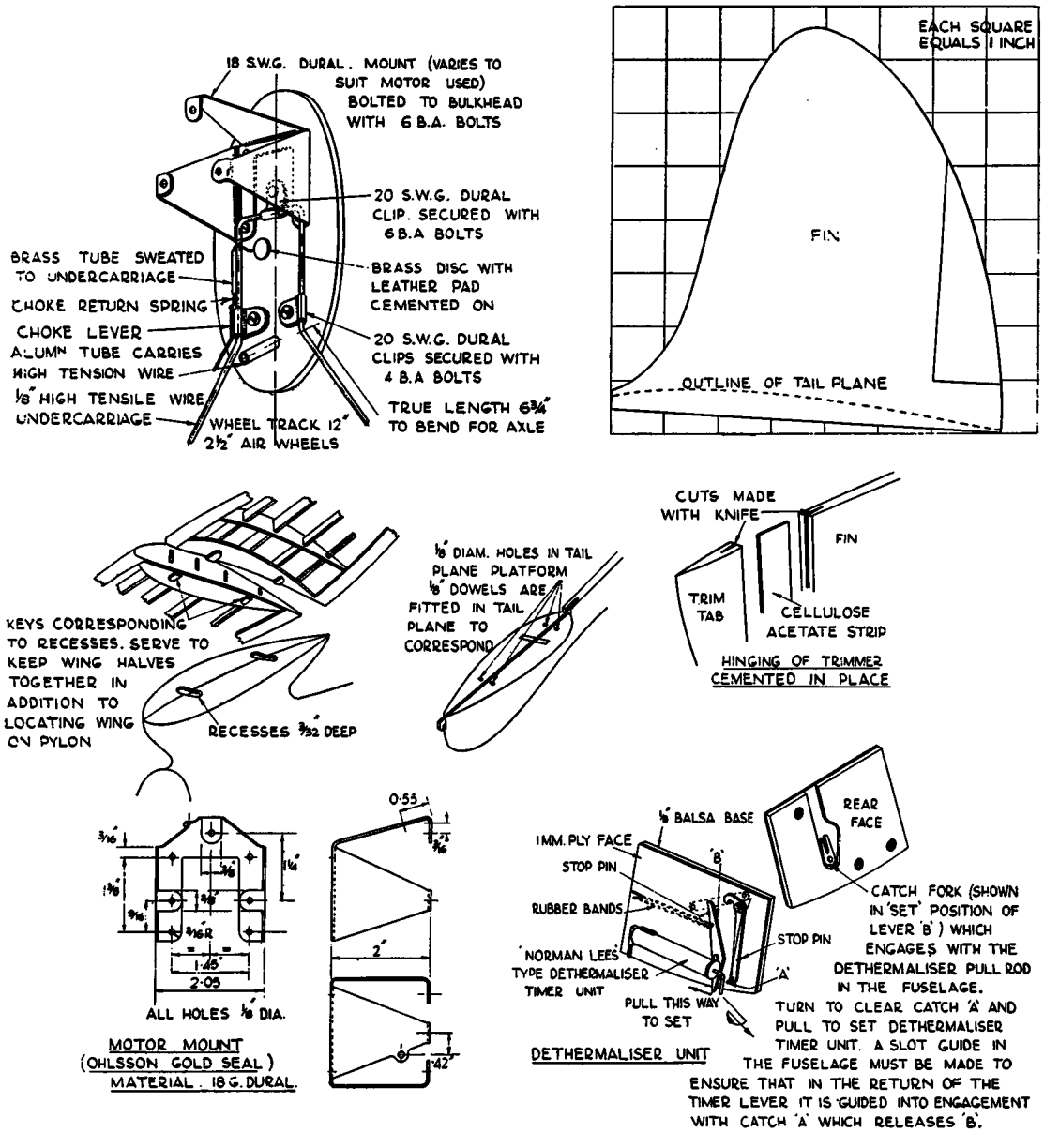
The dethermaliser unit may vary according to whether the timer is home-made or a purchased commercial job, and the drawing shows all necessary details. When fitting the original into the fuselage, I cut the opening in the planking to a suitable shape, inserted the unit and built up the filling-in pieces directly on the unit, sanding the whole lot with the fuselage.

Fixing the Platform-pieces

Before covering, there is one more little job to do on the wings, which is the fixing of the platform-pieces, to correspond with the pylon top, and which we cut out from $\frac{1}{8}$-in. sheet at the same time as we made those for the pylon. These pieces are let in to the undersurface of each wing according to the sketch, and finish flush with the undersurface. The centre section of the top surface is also to be given a balsa covering to withstand the pressure of the rubber retaining bands when the wing is attached to the pylon. Locating recesses and keys, which also serve the purpose of holding the wing halves together, are cut in the pylon top and cemented to the wing respectively as indicated, and dowel pins and holes at the tailplane attachment, as shown, complete the model and make it ready for covering. The fuselage of the original was covered with a single covering of Jap tissue, well doped down with full strength dope, as was the fin, while the wings and tailplane were double covered with red Jap tissue, water shrunk between coverings, and given three coats of dope on completion. The fuselage and fin were finished silver, using four coats

of silver dope brushed on and sanded smooth each time, finishing with a very carefully-brushed coat of the same silver dope slightly thinned with thinners, followed, when dry, contact with petrol and the finish remains tacky indefinitely.

The propeller used on the original is 13 in. diameter and 9 in. pitch, with a blade



with a carefully-brushed coat of clear Chinese lacquer. I have found the usual high-gloss finish sold in the model shops rather unsatisfactory, as it appears to be softened slightly by

1 3/16 in. wide, carved rather thinner than is usual in order that it will break itself rather than damage the engine in the event of crashing.

MIDLAND AREA RALLY WORCESTER

The weather was fine for this rally during the morning of the appointed day, but it failed to maintain its early promise. The upper picture indicates the deterioration which took place and the difficulties encountered by the competitors in the afternoon.

In the next picture a competitor demonstrates an easy and nonchalant style in launching, and on the right R. T. Parham displays his latest glider which is both neat and angular.

The bottom picture shows F. Chatwin of Birmingham, preparing his petrol model for flight, ably assisted by C. Doughty. This was the only petrol entry.

The hero of the day proved to be D. W. Harrison, of Birmingham, shown (3rd down) with the machine with which he won the glider contest. As he also won the duration contest for rubber-driven models and made the longest flight in both of these classes, he finished as undisputed champion of the rally.

There were several flyaways during the fine spell in the morning, all of which clocked over 3 min. Full results are to be found in the Worcester Club report in our Club News section.

Photos by your Editor.

NEWS from the S.M.A.E. and CLUBS

S.M.A.E. 1946 COMPETITION CALENDAR

	AUGUST	4th	BOWDEN TROPHY (PETROL) INTERNATIONAL. HESTON.
D	,,	11th	FLIGHT CUP (RESTRICTED) WOMEN'S CHALLENGE CUP.
	,,	11th	NORTHERN AREA RALLY (2) AT BAILDON, BRADFORD.
	,,	18th	NORTHERN AREA "DAILY DESPATCH" GLIDER TROPHY.
	,,	22nd	"MODEL ENGINEER" EXHIBITION.
D	,,	25th	K. & M.A.A. CUP (BIPLANE) AND CIVIL SERVICE CUP (PAYLOAD)
	SEPTEMBER	1st	GUTTERIDGE TROPHY (WAKEFIELD) FROG SENIOR (INTERNATIONAL) CUP (FLYING SCALE).
D	,,	8th	WHITE CUP (FLYING-BOAT) AND LADY SHELLEY CUP (SEAPLANES).
	,,	15th	PETROL CONTEST (DURATION ON LIMITED RUN).
D	,,	22nd	S.M.A.E. (OPEN RUBBER AND GLIDER).

D = *DECENTRALISED COMPETITIONS.*

MIDLAND AREA NEWS

Minutes of meeting held in Friends' Institute, Moseley Road, Birmingham, on Saturday, May 18th, 1946.

In the chair, Mr. H. J. Taplin.

Clubs represented were Birmingham, South Birmingham, West Coventry, Coventry, Oxford Civil Defence and Wolverhampton. Mr. Houlberg was also present. Apologies for absence were received from Loughborough College and the Hay Aeromodelling Clubs.

The chairman announced the agenda which was as follows :—(1) Minutes of last meeting ; (2) Business arising from minutes ; (3) Correspondence ; (4) Rules and constitution ; (5) Confirmation of election of officers, and election of new hon. secretary ; (6) Subscriptions ; (7) Other business.

The chairman then called on acting hon. secretary, S. W. Smith, to read minutes of meetings held on April 13th and May 4th. Their adoption was carried unanimously.

Mr. Ginns (Coventry), asked for A.B.A. correspondence mentioned in the minutes to be read. The secretary did so, and the meeting approved the Council's replies.

After the chairman had stressed the urgency of adoption of rules and constitution, pointing out the inability of officers to carry out their duties until adoption was carried, he suggested they should be read through in three sections, voting to be on each part.

To this the assembly agreed, and also to vote according to system laid down in rules (i.e. 1 vote for every 10, or part of 10 members per Club). Part one was passed unanimously.

Part two, dealing with clubs in default, after amendment by Mr. Ginns, was also carried unanimously.

Part three, after amendments deleting a clause dealing with submissions to S.M.A.E. Council for approval, altering number of days notice of meetings, and notice of motions, and transfer of rule *re* representatives to a more appropriate position in rules, was carried unanimously.

The chairman recalled that election of officers should be by postal ballot, but one thing against this was the time element. It was suggested that the meeting should proceed to ratify election of the officers as provided for in the letter recently circulated to all clubs. The suggestion was adopted, and all officers, except secretary who had resigned, were unanimously ratified.

The meeting then elected a secretary from two nominations, namely Mr. Smith, proposed Mr. Watts (Coventry), seconded Mr. Harrison (Birmingham), and Mr. Greaves, proposed Mr. Cook (S.B.) and seconded Mr. Jones (S.B.), resulting in Mr. Smith's election by 15 votes to 10.

Mr. Harrison proposed, Mr. Gunn seconded, Mr. Smith's appointment to position of delegate to the S.M.A.E. This proposal was carried unanimously.

Two proposals were put forward for affiliation fee, (1) by Mr. Harrison, seconded Mr. Wilkes, for 2s. per senior Club member, and 6d. per junior, and (2) by Mr. Ginns (Coventry), seconded by Mr. Gunn (W. Coventry), that it be 6d. per Club member. Resulted in the unanimous adoption of proposal No. 2.

A vote of thanks to the chair terminated the meeting.

MIDLAND AREA COUNCIL

As the Coventry Aero Modelling Club were unable to have the use of the aerodrome for the Thurston Cup, this competition was flown in the Midlands on Hockley Heath Aerodrome on July 14th. As there was not sufficient time to arrange a rally in conjunction with this competition the Midland Area is running a rally on August 25th.

Programme—(1) Open Duration Rubber, 3 flights ; (2) Open Duration Glider, 3 flights ; (3) Under 16 years Tyro, 2 flights ; (4) Nomination for Power other than rubber, 40 sec. minimum, 60 sec. maximum, 2 flights ; (5) Novelty competition (duration). Competition to start with the plane in pieces. Time taken to assemble plane to be deducted from flight time. Rubber, 1 flight.

NORTHERN AREA NEWS

By "NORTHERNER"

Firstly, I must congratulate the Midland Area on the drawing up of the excellent constitution for their area. The Northern ideas are much the same as those laid down in the Midland Area Constitution, but, so far, the North have never set them down on paper in detail. I hope that this will be fully discussed at the next Northern Area Meeting, along with another point which is being much discussed in this part of the country at the moment, "Is the Northern Area too large?" There is certainly quite a strong feeling that it is too large to do justice to all clubs in the area, and there seems only two alternatives, the first is, to split the area into two parts, a North Eastern Area (Yorkshire, etc.), and a North Western Area (Manchester, Liverpool, etc.), or let the various large towns form local committees similar to the present Manchester & District Council of Model Aero Clubs, consisting of representatives from the clubs in and near the towns. These local committees could then appoint a district representative to attend Northern Area Council Meetings, and each representative could carry one vote from each club in his district. Northern Area Council meetings would then consist of the elected officers and one or two representatives from *each* of the district councils. One could then truthfully say that the Council did represent the whole of the North of England. It would be interesting to hear the views of other Northern clubs on this subject. What about it, chaps?

Before closing my own comments I would like to mention one other subject that seems to be much neglected

in the North, and that is, the exhibition. I notice that an appeal has been made for stewards, etc., to do duties at the exhibition. I do hope that we shall not leave all this work to our Southern friends. Let us see the North doing its share, yes, even if it does mean sacrificing a few days of ones holiday.

Now here are the few club reports. The most outstanding report comes from the *Wythenshawe Model Aero Club*. Mr. A. Timms, the Hon. Secretary, is just completing the Nova No. 1 Auto Ignition Engine, described in a recent issue of MODEL AIRCRAFT, another member has also a petrol engine almost completed. There is not a great deal of enthusiasm for rubber-powered models in this club at the moment, because of the poor quality of the rubber (never mind, this worry may soon be removed). Gliders are extremely popular, and almost every member has a glider. Mr. Winters recently took a newly constructed "Dabchick" on to the flying field, and in its first flight off the tow line, it struck a thermal and everyone watched it circle steadily higher and higher until it passed out of sight, the time being 30 min. Mr. Mosby, of the same club, launched a "Baby Gull," and in a short time that also vanished from sight. The *Radcliffe & Whitefield A.T.C. Aircraft Club* state that they are progressing with their club gliders, and although these are being built only on one club night per week, they hope to be able to enter one or two contests this season. The last report comes from the *Whitefield Youth Movement Model Aircraft Club*, with a copy of their magazine, which has been published regularly almost every month during the past two years. This club possesses some poetical members who keep the magazine quite lively. Some good articles are also published from time to time, by members of the club. The Hon. Secretary is now Mr. J. C. Cookson, who has also taken over the publicity secretary duties, the address being the same as before. Mr. E. G. Bartle has been appointed competition secretary.

IRISH NATIONAL CONTEST

OFFICIAL RESULTS

CLASS "A" (Wakefield Models)

		1st secs.	2nd secs.	3rd secs.	Total secs.	Avge. secs.
1st	R. Copland, S.M.A.E. ...	426.5	91.2	186.4	704.1	234.7
2nd	R. Hinks, A.B.A. ...	112.05	117.0	76.9	305.9	101.98
3rd	R. Calvert, A.B.A. ...	106.4	74.2	111.6	292.2	97.4
4th	R. Warring, S.M.A.E. ...	194.4	13.5	6.6	214.5	71.5
5th	R. Hanna, M.A.C.I. ...	72.0	56.6	77.0	205.6	68.53
6th	J. Pollard, M.A.C.I. ...	78.4	68.05	52.6	199.05	66.35

Best flight of day, R. Copland, 426.5 secs.

Best performance by an Irish designed model, R. Hanna, 68.53 secs.

PETROL MODELS

		1st secs.	2nd secs.	Total secs.
1st	H. Charles, M.A.C.I. ...	92.0	59.1	151.1
2nd	W. Little	74.6	72.0	146.6
3rd	S. Lanfranchi, A.B.A. ...	78.4	63.0	141.4
4th	R. Copland, S.M.A.E. ...	33.8	83.6	117.4
5th	H. Charles, M.A.C.I. ...	55.0	27.0	82.0
6th	K. Tansley, S.M.A.E. ...	38.7	42.8	81.5

Best flight of day, H. Charles, 92 sec.

Maximum motor run, 20 sec.

NEWS FROM THE CLUBS

BATHGATE AND DISTRICT M.F.C.

The first annual gala held on June 2nd was a tremendous success. The total number of entries was 98, clubs coming from Edinburgh, Fife, Glasgow, Paisley, Garnock, Stirling, Falkirk and Strathallan. Spectators numbered around the 200 mark.

The results were as follow :—

Junior Glider. Aggregate of 3 flights.

A. Harvey, Stirling, 5 min. 20.5 sec. ; W. McConnachie, Glasgow, 2 min. 33.5 sec. ; H. Gorrie, Falkirk, 1 min. 36.8 sec. On his third flight A. Harvey put up the best time of the day, viz. 2 min. 45.5 sec.

Open Rubber Duration, R.O.G. Aggregate of 3 flights.

H. A. Wardell, Edinburgh, 3 min. 2.9 sec. ; P. Montgomery, Fife, 3 min. 0 sec. ; J. Wedderspoon, Fife, 2 min. 25 sec. H. A. Wardell required only 2 flights to win.

Open Glider—Winch Launch. Aggregate of 2 flights.

R. Marshall, Garnock, 2 min. 59 sec. ; P. Montgomery, Fife, 2 min. 43.4 sec. ; S. R. Martin, Edinburgh, 1 min. 45 sec. P. Montgomery had only one flight, his model flying away and being lost.

Nomination Event. One flight. Margin of error.

G. Bisset, Falkirk, 1 sec. ; S. R. Martin, Edinburgh, 7 sec. ; P. Montgomery, Fife, 11.5 sec.

Consolation Prizes were awarded to N. Anderson, Edinburgh; R. M. Bowie, Strathallan; R. Venner, Dunfermline.

BIRMINGHAM M.A.C.

The handful of keen modellers which composes the B.M.A.C., have been having some concentrated flying lately, visiting Worcester, Rochdale and the Northern Heights Gala in three successive weeks. D. W. F. Harrison won both the Open Duration and Glider events at Worcester, but we can only record a tale of woe from the Northern Rally and the Northern Heights Gala ! Perhaps the good weather at these two rallies gave us too much of a surprise.

Now that W. Dallaway and R. C. Monks are in the Forces, we see fewer gas jobs about ; Frank Chatwin, however, visited Baildon for the Hamley Trophy and came fourth.

SOUTH BIRMINGHAM M.F.C.

Two Club trophies have been presented, H. J. Taplin's Tankard, and Freddie Wilkes's gold-plated Flying Scale Trophy. The Tankard has yet to be allocated but the winner of the Wilkes Trophy is Stan Rogers, who won a consolation prize in *The Aeromodeller* Taylorcraft "Auster" contest.

Quite a few members are experimenting with rocket models; Phil Dash has a "Flaming Ptero," Mr. Taplin a capable flyer of his own design, and R. H. Greaves a Frank Zaic design, which is rather under-powered with a "Brocks" rocket.

F. W. H. Wilkes is constantly adding to his fleet of 1/144 scale midget solids, and is now concentrating upon Schneider Trophy aircraft.

An attempt is to be made to form a club in the Bearwood district of Birmingham. Anyone interested should contact H. J. Taplin, 409, Hagley Road, Bearwood, Birmingham.

Mr. Taplin filmed 9.5 mm. shots of the Shelley Cup contest on Hockley Heath aerodrome, and projected several scenes for us in our clubroom recently.

BRISTOL AND WEST M.A.C.

The Club Packer Cup was run off at the same time as the Weston, and the best time was put up by a junior, Bob Moon, who flew a slab sider in the fine spell in the

morning to aggregate 4.45. Second and third places were obtained by M. Garnett and A. H. Lee, who flew their streamliners in the rain to aggregate 4.35 and 3.58, respectively. The best flight was 2.01 by M. Garnett.

As usual with Bristol weather, the following Sunday was calm and very hot, with thermals in real abundance. An impromptu contest held on Durdham Down in the afternoon resulted in six gliders flying o.o.s., most of which have now been recovered, thanks to the help of the press.

M. Garnett's gas model, a photo of which appeared in the May MODEL AIRCRAFT has commenced its test flights, and is proving to be very stable and slow flying.

BUSHY PARK M.F.C.

Radio Control is now the most discussed topic of the Club and two models are process of construction. Messrs. Earp and Guest are combining forces to make one model and hope to fly it by next spring. The outstanding part about this plane is its engine which is a home-made horizontally opposed twin cylinder 20 c.c. engine driving a 20 in. propeller.

The juniors of the Club, however, are coming along so well that they often clock just as good times as their more experienced seniors. Messrs. Smith and Sargeant came 1st and 2nd respectively, in the competition sponsored by Mr. York, on Hounslow Heath recently, Smith's job landing later in Leatherhead—about 15 miles.

These two lads also won consolation prizes for the best flights by juniors at Northern Heights Gala Day.

The ladies of the Club were well represented also at Northern Heights Gala Day. Mrs. Gunter entered a very well made "Thor" for the open petrol competition and Miss R. Baker entered the unusual "Yogi."

COVENTRY M.A.C.

On June 23rd A. J. Barr, flying his own design lightweight rubber job, broke the Club's open duration record with a flight of 4 min. 12.2 sec. The previous record was held by R. Toms with 3 min. 7 sec.

A recent open glider contest was won by R. Toms with an aggregate of 74.35 sec. He was flying his own design F.A.I. sailplane, a streamlined all Balsa machine. 2nd was J. Barrell flying an "Igo" with 58.1 sec., his only flight. P. Ginns came first in the junior class with 51.9 sec. The weather was the cause of low times.

ST. HELENS M.A.C.

At Rochdale, during the Northern Area Rally, R. Scott broke his own club record of 4 min. 19 sec. with a competition flight of 4 min. 26.5 sec. This now stands as our official club record. Mr. Scott was flying his "Condor Clipper."

Some recent biplane flying by Mr. Ball, provided the Club with a spectacular display and food for thought.

Messrs. H. Halpin and G. Allen are flying semi-scale machines almost exclusively and are recording some impressive performances compared with the standard duration jobs flown by other members.

KINGSBURY M.F.C.

During the weekend of July 22nd and 23rd we experienced some of the best weather of the year, members taking advantage of it to break two Club records.

On the 22nd, J. Bowerman raised the H.L. Rubber record to 15 min. 43 sec. with his "Coot I," the model remaining at a height of about 500 ft. for the greater part of the flight.

On the 27th G. D. Miles's tail-less glider contacted another thermal, this time at Hounslow Heath, clocking 7 min. 30 sec. This is believed to be an unofficial British record. At no time during the flight did the model rise above 300 ft. This model, though of simple design, has shown exceptional flying capabilities, and is more stable than some contemporary orthodox models. The model is a lightweight, span 60 in., wing area 360 sq. in., and employs a reflex trailing edge and washout.

LUTON AND DISTRICT M.A.S.

Highlight in the Club's competitions, was the seniors v. juniors team event on June 9th, which was won by the juniors. The competition (for sailplanes) was flown in a high wind by teams of four. Seniors' aggregate was 655 sec., their best flyer D. Bateman losing his "Wasp" on its first flight after 342.5 sec. (This model was found later and returned from 20 miles away.) The juniors' aggregate was 710.75 sec. their best flyer (also flying a "Wasp") was E. King with a total for two flights of 289.5 sec., thus qualifying for the special prize generously presented by S. Miller.

Four clubmen went to Epsom Downs for the Weston Cup, which was flown in a downpour of rain. R. Hinks was unlucky in losing his H.W.B. 100. E. Clark flying a "Rocket" was consistent. R. Hinks performed well in placing second in the Wakefield event of the Irish Nationals, once again flying the faithful "100."

MERSEYSIDE M.A.S.

The society has started the season with somewhat better times than of late, both individually and for "Plugge" points. Mr. B. Haisman put up the club's best times for the "Gamage," the "M.E." No. 2 and No. 1.

Times at the Northern Area semi-decentralised "Pilcher" Cup event were not startling, owing to high winds, and these also accounted for the very numerous "write-offs" during the day. Models simply "folded-up" on the line. However, T. Comber flew very gallantly, and was rewarded by placing third in the N.A.

Several interesting models have appeared, including a very aggressive-looking tail-less glider, by J. E. Lovett. It is hoped to fit a compressed-air unit to this model later on. A powered glider, "Bo-Jangles" by D. R. Hughes, and a streamlined low-wing "Flight Cup" model, by W. A. Jackson.

NORTHAMPTON M.A.C.

On May 26th the Northampton Model Aero Club held its N.M.E. Cup for rubber powered models, at their Duston flying ground. First place was gained by E. W. Evans, flying his well-known "Firefly," with an aggregate of 279.3 points, gaining 49 out of a possible 50 points, for workmanship, P. Wilkinson and J. Knight being second and third, with 269 and 236.5 points.

P. Wilkinson, one of our members, recently put up quite a good show at Eaton Bray Opening Day, gaining first place in the Open Rubber Duration Contest.

Several very good times have been put up on the club flying ground recently, N. T. Barry losing his "Owlett" overhead in a thermal after chasing it for about four miles. A 37½ span glider of his own design.

Another member of the club, E. Hudson, also had a good flight with his "Albatross," which flew o.o.s. in 5 min. and did a total time of 8½ min.

At the recent French tail-less competition, at Lyons, out of a total of four modellers representing England, three were members of the Northampton M.A.C. Howard Boys, leader of the British team, gained first place in the Rocket-propelled Section. G. B. Dun gained sixth place in the glider category, flying A. J. Cockle's latest tail-less design, the 6 ft. 5 in. span "Scylla."

NORTHERN HEIGHTS M.F.C. GALA DAY,

The gala was held on Langley Aerodrome, which was made available by the generosity of Hawker Aircraft Ltd.

Before the competition programme commenced, a short service of dedication to those airmen who, by their supreme sacrifice, had made the day possible, was conducted by Padre A. P. Hyslop, a senior chaplain of the R.A.F., assisted by Air Marshall A. Titmass.

The first event, for the longest duration, was won by Dennis Lees, of the Bradford Model Aircraft Club, with a time of 485.2 sec. Second came R. H. Warring (Zombies), 454.8 sec. Third, D. J. Buxton (St. Albans), 383.6 sec.

The model sailplane event produced some excellent performances, the best of which were made by : P. Brown (St. Albans), first, 321.4 sec. ; B. Chandler (Croydon), second, 252.5 sec. ; D. G. Butler (Surbiton), and D. Hinstridge (Chingford), third, tie, 243 sec.

The third event was, in effect, a combination of the sailplanes and rubber-powered models—again for the highest total duration of flight. First, Croydon M.A.C. ; second, Brentford & Chiswick M.F.C. ; third, Northern Heights M.F.C.

The power event included machines from 3 to 10 ft. First, Bob Copland, Northern Heights M.F.C., 81.8 points ; second, Ken Tansley, Northern Heights M.F.C., 63.0 points ; third, G. G. Harris, Croydon, 51.5 points.

The free-lance semi-scale models was won by R. T. Capon, 188.4 points ; second, W. Geddie (Zombies), 169.5 points ; third, R. Minney (Luton), 145 points.

During the course of the day two additional contests were in continuous session. One, the nominated flight time of 45 sec. was won by R. Wilton, of Northern Heights, with an error of only .2 sec.

The other, the Concours d'Elegance, was won by R. H. Smith, of Wolverhampton, with his beautifully finished petrol-driven model, " Mercury IV."

Winners in the other sections were : Solid scale models, D. Yeabsley (Croydon) ; flying scale models, —. Miller (Luton) ; General flying, R. T. Capon ; Glider, N. Deudney (Walthamstow), unorthodox models, A. J. Cockle (Northampton).

The gala championship cup was won by R. T. Capon, whilst the prize for the longest flight of the day was won by D. G. Lees, 352 sec., of Bradford, and the longest flight by a lady was put up by Mrs. Close, 70 sec., of Brentford & Chiswick M.F.C. The six junior competitors obtaining the highest flights in the sailplane event received consolation prizes.

With the conclusion of the day's flying, the cups, trophies and prizes were graciously presented by Mrs. Camm, wife of S. Camm, O.B.E., the famous aircraft designer.

ROMFORD AND DISTRICT M.A.C.

Despite the weather the above club has been flying regularly this season. Some good times have been put up, among which is 14 min. 10 sec. by Dave Howard's " Bitsa."

Members are enthusiastically competing for the S.M.A.E. Merit Certificates.

Petrol jobs have been to the fore lately, three having put in an appearance on the flying field. The first to fly successfully was Brian H. Wager's 5 ft. 6 in. span high-wing cabin job. Another model, a Bowden " Contest " beautifully built by a member only 15 years of age, is unfortunately underpowered with an Atlas 3.5 c.c.

An exhibition, staged in a local cinema foyer, was successful in arousing considerable public interest.

WORCESTER M.A.C.

Results of the Midland Area Rally held on Perdiswell aerodrome, June 16th :—

Open Rubber, aggregate of 3 flights. Harrison, Birmingham, 388 sec. ; Ward, Wolverhampton, 339 sec. ; Parham, Worcester, 305 sec. ; McGill, Worcester, 305 sec.

Open Glider.—Harrison, Birmingham, 263 sec. ; Parham, Worcester, 252 sec. ; Payne, S. Birmingham, 249 sec. ; Dalloway, Birmingham, 248 sec.

Open Nomination.—Dalloway, Birmingham, Nil ; Chatwin, Birmingham, .5 sec. ; Parham, Worcester, 2 sec. ; Pollard, Worcester, 2 sec.

Best flights were :—Harrison, rubber, 201 sec. ; Harrison, glider, 129 sec. Paynter won the Worcester Corporation Challenge Cup for the best flight by a W.M.A.C. member, with a flight of 155 sec. (rubber).

We are using Perdiswell aerodrome regularly now, catching frequent thermals. Parham lost his lightweight duration model, 8 min. o.o.s. on June 23rd. Immediately afterwards, Wills appeared in the same spot on his record breaking glider (full size) flight, and he, too, was soon o.o.s. ! This shows the type of thermals we're getting ! !

We hope this will attract many flyers to Worcester on August 18th (Sunday) for an open rally. Events will be open rubber, open glider and open nomination (any type). We hope to attract a few petrol models, too ! !

CHANGES OF ADDRESS AND NEW SECRETARYSHIPS

Birmingham Model Aero Club : Secretary, D. W. F. Harrison, of 33, Arboretum Road, Walsall.

Brentford and Chiswick M.F.C. : Hon. Sec., N. Winsley, 5, Berestide Road, Hammersmith, W.6.

Seaham M.F.C. : Hon. Sec., T. Holliday, 2, Queen Street, Seaham, Co. Durham.

Surbiton and District Model Flying Club : Hon. Sec., D. C. Butler, 111, Somerset Avenue, Hook, Surrey, and the Press Secretary is now T. W. Laming, 229, Red Lion Road, Tolworth, Surrey.

Victoria M.A.C. : Hon. Sec., W. R. Clark, 88, Bishops Way, Bethnal Green, E.2.

Worcester M.A.C. (Change in secretary's address). Hon. Sec., C. R. Brazier, " Sunray," Tollodine Road, Worcester.

NEW CLUBS

Goole Old Pupils' Model Club : Hon. Sec., C. H. Charlesworth, 40, Manuel Street, Goole, Yorks.

Stafford and District M.A.C. : Hon. Sec., J. R. White, 35, Salt Avenue, Stafford.

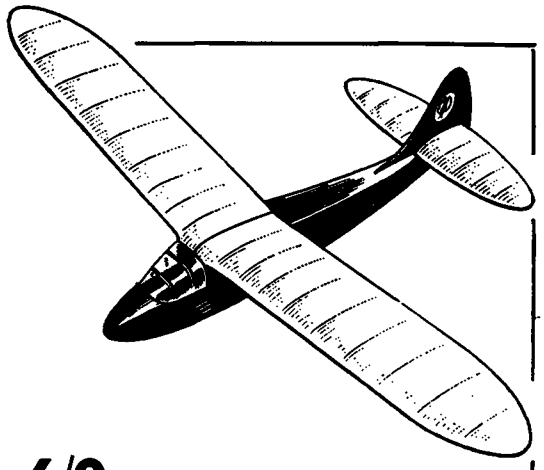
CHANGE OF TITLE

Goole Old Pupils' Model Flying Club now changed to Goole and District Model Flying Club. There is no change in the Hon. Secretary's name and address, which remains as before.

Sale Aeronautical Society now changed to Sale Aero Club. Hon. Sec. (as before) : G. D. Barnes, 61, Clough Avenue, Woodheys, Sale, Cheshire.

FROG TRADE MARK

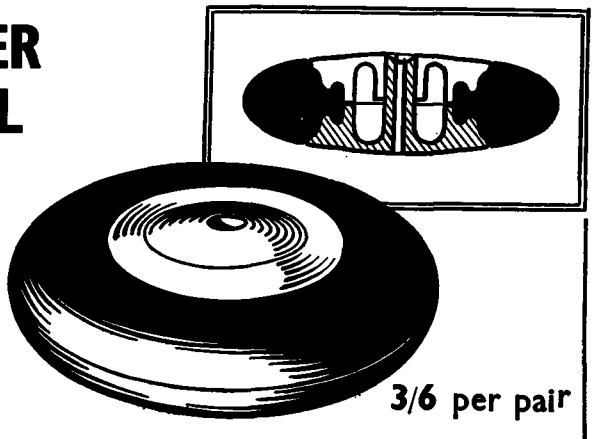
SAILPLANE CONSTRUCTION KITS



A new kit to the usual high FROG standards for this new sailplane is now in production.
It contains ample supplies of all materials necessary to construct the model. The bulkheads, fuselage sides, wing ribs and other shaped pieces are ready cut to shape. Cement, paint, lacquer, tissue, sandpaper, insignia, full size drawings and detailed instructions are also included.

6/9

FROG TRADE MARK POWER MODEL ACCESSORIES



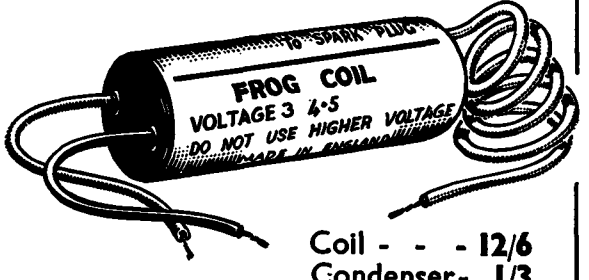
These new 2½ in. diameter wheels for power models show a great advance over normal types. They are of streamline section, with a special rubber tyre assembled under pressure to a moulded plastic hub. Take offs are improved by the better running qualities and landings are safer as it is impossible for the tyre to be knocked off the hub.

3/6 per pair

A specially designed high efficiency FROG ignition coil for all model petrol engines, complete with flexible leads and for use on 3 to 4.5 volts. Weight is 1½ oz.

The FROG light-weight condenser is matched to the FROG coil and weighs only ⅜ oz.

Also available from stock are WICO - PACEY ½ in. × 32 T.P.I Sparking Plugs. These are of 2 piece design and may be readily taken apart for proper cleaning.



Coil - - - 12/6
Condenser - 1/3
Spark Plug - 5/-

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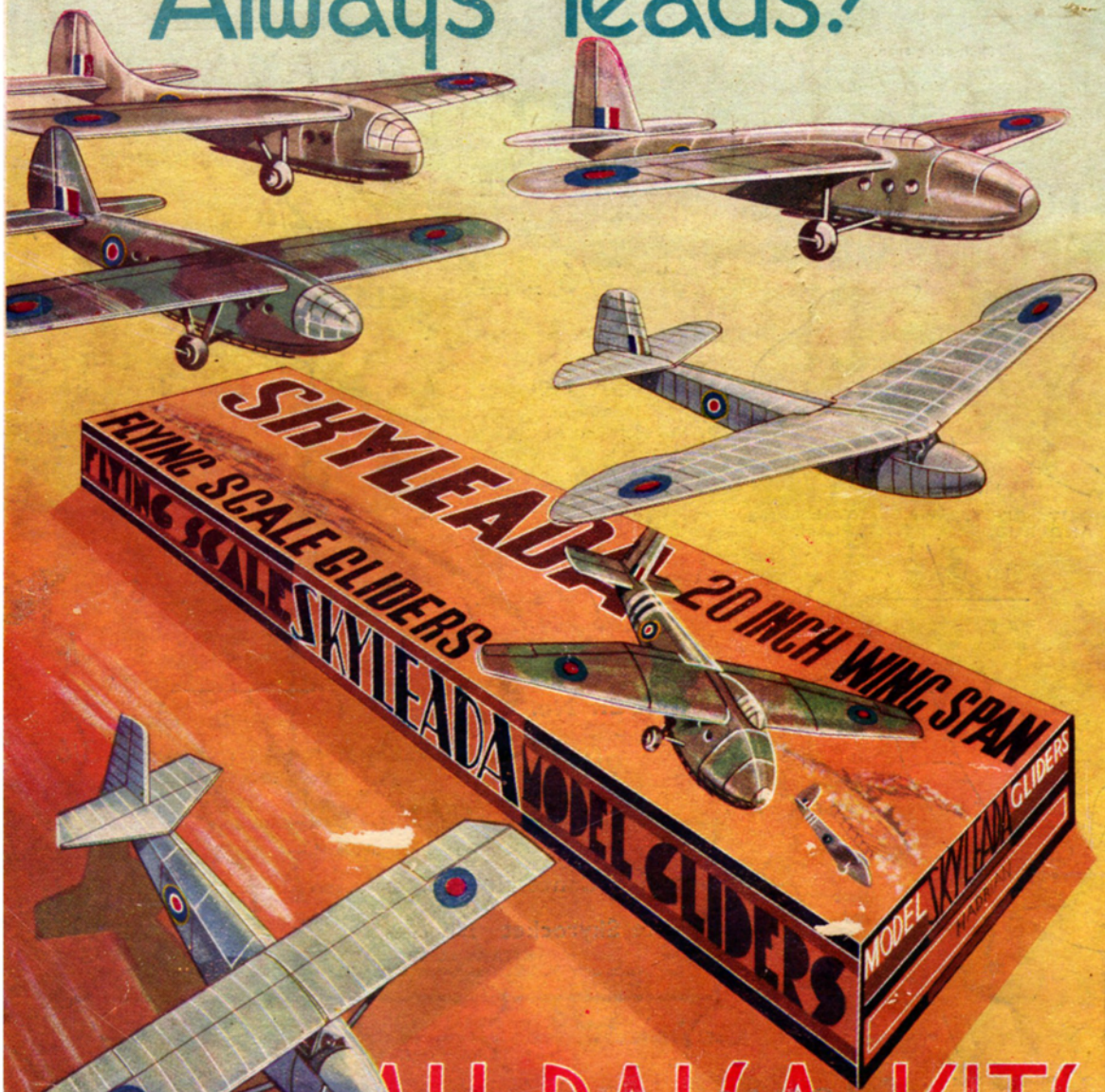

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