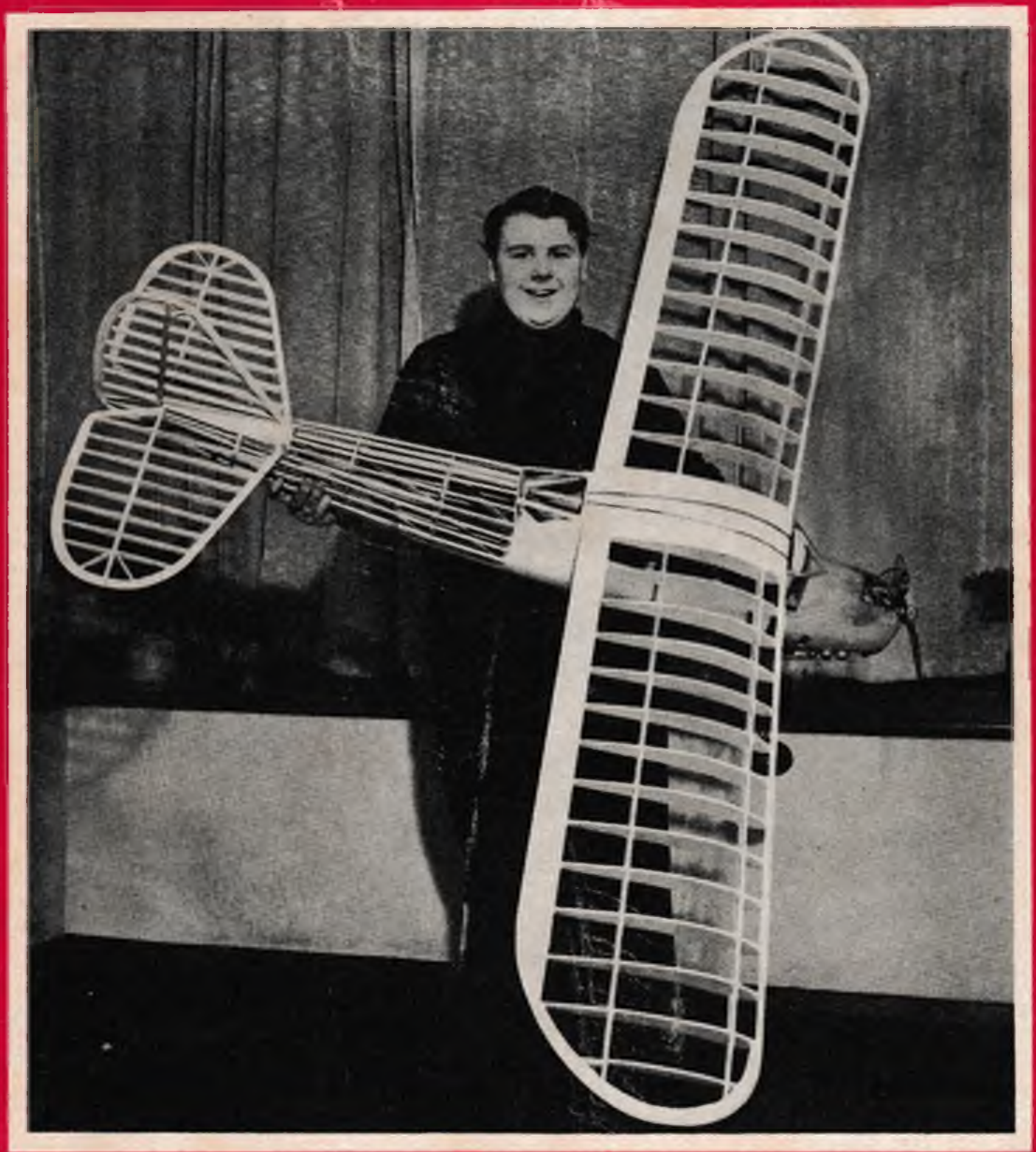
AERO MODELLER

MAY - 1939
Vol. IV No. 42
Monthly Price 6d.



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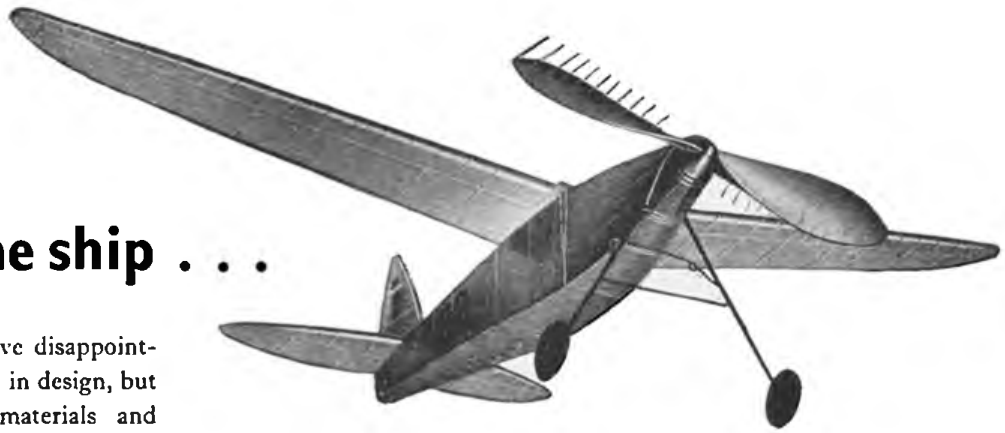

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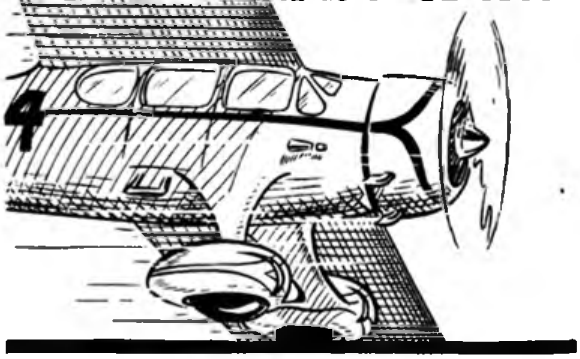

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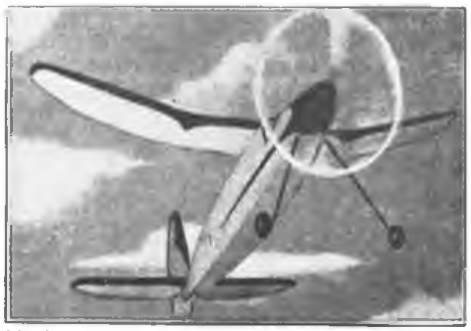

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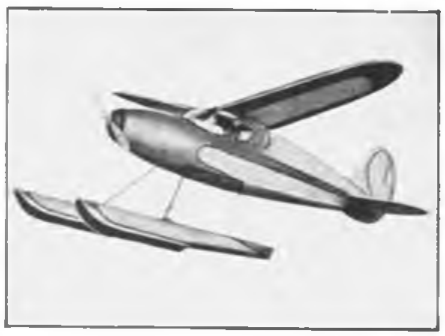

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This is certainly the model 'plane of the year. For all those entering contests the M.S.S. LYNX will prove a real winner. At the first meeting of the Lancashire Aero Club, Leaming Cup, the LYNX took first and second places. The final placings were as follow:

1st, LYNX—Built and flown by A. Tindall.
2nd, LYNX—Built by F. Bailey in 4 days and only 1½ sec. behind the winner. Incidentally, this was the machine's first flight. 3rd, Cadet Major —A. Hill.

SPECIFICATION: Wing span, 41½ in.; area, 208 sq. in.; length OA, 37 in.; tail-plane area, 66 sq. in.; total weight, 8½ oz. (ready for flight). Complies with Wakefield Int. Cup specification. We hold the sole rights of reproduction of this famous machine, and our kit has been supervised by Mr. Tindall. Kit includes ready-carved propeller, finished free-wheel type prop. shaft, wheels, printed ribs, contest rubber, tissues, cement, dope; in fact, everything possible to make a kit the finest obtainable in this world.

Price of kit, complete with special ready-carved propeller, only **14/6** Post Free

Special Entrants' Kit. As above, but containing materials only for making prop., prop. shaft and wheels instead of finished articles. (Complying with Wakefield Contest rules). **10/6** Post Free

SPECIAL OFFER For a limited period only we are offering full size "LYNX" plan and instructions, all printed Balsa and M.S.S. famous 1939 Catalogue for 3/6. Send your order immediately.

M.S.S. VALUE KITS

"MIGHTY MIDGET" ... ... NOW ONLY	£3	0 0
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VOL. IV. No. 42. MAY, 1939

CONTENTS

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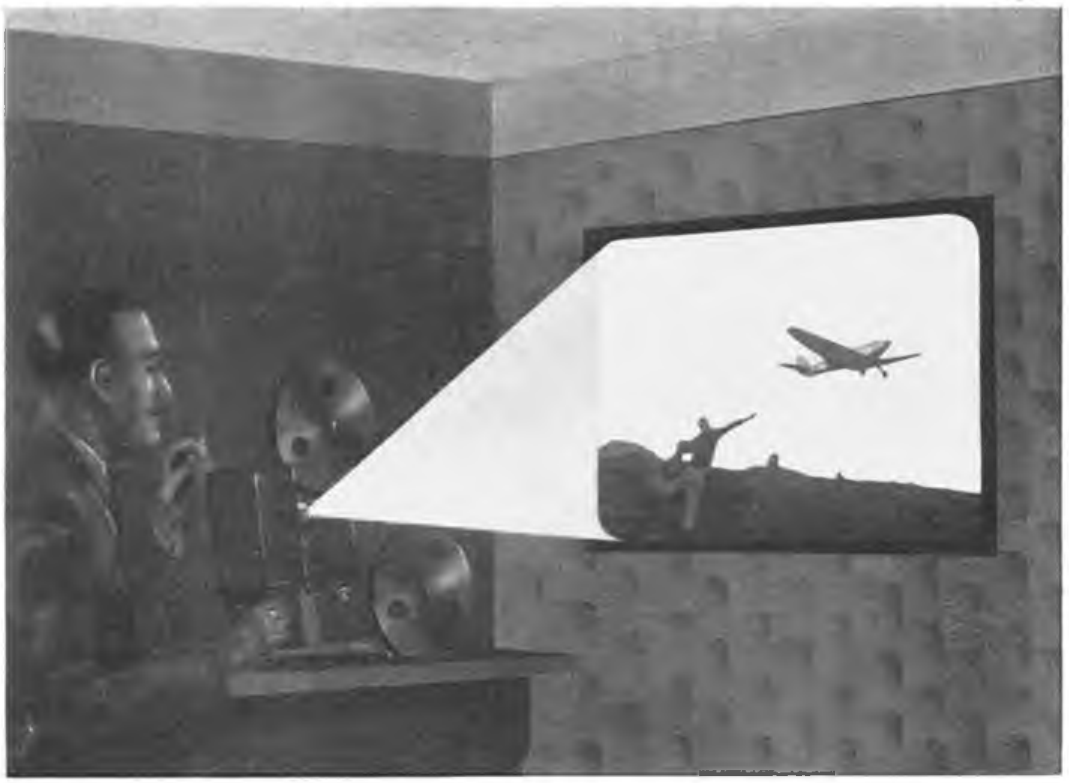
THE HAWKER "HURRICANE"



We reproduce herewith portions of a film showing Mr. D. J. Miller launching his 80-in. span flying-scale model of a Hawker "Hurricane" petrol 'plane, which is described and fully illustrated in this issue.

Our front cover photograph is of the well-known film star "Fat Boy," Graham Moffatt, with his latest petrol 'plane, which he has built during the making of his latest film, "Where's that Fire?"

(Courtesy, Twentieth Century Productions Ltd.).

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MAY - 1939
Vol. IV. - No. 42

Tel. Leicester 65322

The AERO MODELLER

INCORPORATING THE "MODEL AEROPLANE CONSTRUCTOR"

EDITORIAL

E have received a considerable number of congratulatory remarks on our latest covers, and particularly on the fine photograph on our last cover, in which a model was shown just leaving the take-off board. Unfortunately, we described this model as being that of Mr. Chasteneuf's, whereas, of course, it was Mr. Bop Copland's world record holding model, "G.B.3." We offer our apologies to both these gentlemen, but as we know them to be lifelong friends we feel there will not be a crisis over this matter!

Another correction we have to make is in regard to the description of the Wakefield plans, which were given away with the last issue—and over *them* a crisis very nearly *did* develop in our offices! Originally, we intended to print one plan full size—and then arose the old, old question, "To gear or not to gear." Some said we must publish plans of a model with gears, and others said there would be trouble with some of our Wakefield fans if we didn't publish a straight drive! Being firm believers in the cause of peace we compromised and published plans of both types of model, but this necessitated drawing the models half-size, and unfortunately they were described as full size on the cover.

However, we have endeavoured to make amends with the plans given away with *this* issue—surely one of the most ingenious designs ever produced, and it is definitely full size! On a sheet considerably increased in size.

Whilst this model may be a little too advanced for some of our readers, we feel that there are many duration enthusiasts who will appreciate such a fine design from such a well-known aero-modellist, for this model is designed by none other than Monsieur Fillon, well known as the winner for France of the Wakefield Contest in 1937.

Talking of Wakefield models reminds us that the Wakefield Fund is not growing fast enough—that is quite blunt and to the point, and it is meant to be. With the S.M.A.E. report we publish a full list of donations received to date totalling less than £150, and even with our £15 15s. and the £10 10s. promised by The Balsa Wood Co., the £5 5s. from The Air League of The British Empire, *and* the £20 realised by The Lancs. Model Aeronautical Society Raffle, the total is under £200. Now, why *is* it that some clubs can run a dance or an auction, or even just make a collection, and produce two or three guineas, and yet there are many others who so far appear to have done nothing? To our knowledge there are now close on 300 clubs in the country—two guineas from each, and the job is done—or very nearly. With an average membership of 30 it means a matter of 1s. to 1s. 6d. per member and the chance of a free trip to America. What a grand lottery! But surely it is something more than this? Can it not be claimed that it is the *duty* of every club member to do his share to raise a few pence for the fund? If some clubs can do it the others can. Entry to the Wakefield Team is open to any aero-modellist in the country, whether he belong to a club or not. We have our prestige and reputation to uphold—and we have the Cup to bring back from America if possible this year. We do appeal to all club secretaries to bring to the notice of their members at their next club meetings the need to provide a substantial sum so that our picked team can travel in a suitable manner to America to compete for the Wakefield Trophy.

Mr. L. Hawkins, Treasurer of the S.M.A.E., will gratefully acknowledge all contributions, however large or small, at his *new* address, "Heathview House," Meadowcourt Road, Lee Green, London, S.E.3.

On pages 340 and 341 we publish reports and news from the S.M.A.E. We would draw particular attention to two items in the second of the reports. Firstly, to the munificent gift of £300 to the Wakefield Fund by Lord Wakefield, patron of the S.M.A.E., to whose generosity and support all aero-modellists owe so much; and secondly to the resolution, carried unanimously, "That the N.G.A. policy be accepted for the purpose of petrol 'plane registration with the S.M.A.E., and to accept the Editor of THE AERO-MODELLER's offer to publicise the S.M.A.E.'s suggested safeguards." This is dealt with fully by Mr. Ship in his notes on page 342 of this issue.

We would also draw attention to the first part of the first report, on page 340, in which reference is made to the inauguration of the Dray Memorial Fund, which has been opened by a donation of 25 guineas from the S.M.A.E., followed by a sum of five guineas from the

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directors of THE AERO-MODELLER. We sincerely hope that all clubs will send a donation to such a "worthwhile" fund.

Empire Air Day, which is organised by the Royal Air Force in conjunction with the Air League of the British Empire, is the only occasion during the year on which the Air Force is "at home" to the public. It provides an opportunity for visitors to acquaint themselves with the various units of the Metropolitan Air Force, which is primarily concerned with the air defence of Great Britain, and with the activities of the Flying Training Schools.

This year marks the "coming of age" of the Royal Air Force, which came into being on April 1st, 1918, and the sixth Empire Air Day will be observed on Saturday, May 20th, at 78 aerodromes, including 63 Royal Air Force stations, as compared with 58 last year. This is the largest number that has ever been open to inspection by the public.

Of the remainder, 11 are civil aerodromes where personnel are being trained for the Royal Air Force, the Auxiliary Air Force, and the Royal Air Force Volunteer Reserve.

Stations will normally be open from 2 p.m. until about 7 p.m. The programme at each station will include flying displays provided by local units, supplemented, in many cases, by demonstrations of aircraft from other stations. The public will be afforded the opportunity of witnessing the performance of the latest types of monoplane fighter and bomber aircraft now in service. Several types of aircraft will be available for inspection at most stations, and the workshops, hangars, mess-rooms and barrack-rooms will also be open to the public.

Admission for adults will be 1s., and for children 3d. The profits will be allotted by the Air Ministry to charitable and philanthropic objects connected with aviation.

As we feel sure that many of our readers will wish to visit one or other of the R.A.F. Stations, we publish herewith a complete list of them, together with a list of civil aerodromes, at which also flying displays will be given.

THE EDITOR.

List of R.A.F. Stations to be opened to the public on Empire Air Day, May 20th, 1939.

Abbotsinch, Renfrewshire.
Acklington, Northumberland.
Aldergrove, co. Antrim.
Biggin Hill, Kent.
Bircham Newton, Norfolk.
Boscombe Down, Wiltshire.
Brize Norton, Oxfordshire.
Calshot, Hampshire.
Cardington, Bedfordshire.
Castle Bromwich, Warwickshire.
Catfoss, Yorkshire.
Catterick, Yorkshire.
Church Fenton, Yorkshire.
Cranfield, Bucks.
Cranwell, Lincolnshire.
Debden, Essex.
Detling, Kent.
Dishforth, Yorkshire.
Duxford, Cambridgshire.
Evanton, Ross-shire.
Felixstowe, Suffolk.
Filton, Somersetshire.
Finningley, Yorkshire.
Gosport, Hampshire.
Halton, Bucks.
Harwell, Berkshire.
Hawkinge, Kent.
Hemswell, Lincolnshire.
Hendon, The Hyde, N.W.9.
Henlow, Bedfordshire.
Hornchurch, Essex.
Hucknall, Nottinghamshire.
Kenley, Surrey.
Leconfield, Yorkshire.
Leuchars, Fife.
Linton-on-Ouse, Yorkshire.
Manby, Lincolnshire.
Manston, Kent.
Marham, Norfolk.
Martlesham Heath, Suffolk.
Mildenhall, Suffolk.
Montrose, Angus.
Mt. Batten, Devonshire.
Netheravon, Wiltshire.
Northolt, Middlesex.
North Weald, Essex.
Odiham, Hampshire.
Pembroke Dock, Pembrokeshire.
Penrhos, Caernarvonshire.
South Cerney, Gloucestershire.
Stradishall, Suffolk.
Tangmere, Sussex.
Tern Hill, Shropshire.
Thornaby, Yorkshire.
Thorney Island, Hampshire.
Turnhouse, Midlothian
Upper Heyford, Oxfordshire

Civil Aerodromes.

Ansty, nr. Coventry, Warwickshire.
Blackpool, Lancs.
Bristol (Whitchurch), Gloucestershire.
Cardiff, Glamorganshire.
Dyce, Aberdeenshire.
Feltham (Hanworth Park), Middlesex.
Hamble, Hampshire.
Luton, Bedfordshire.
Manchester (Ringway), Lancs.
Norwich, Norfolk.
Plymouth (Roborough), Devonshire.
Reading (Woodley), Berkshire.
Shoreham, Sussex.
Stoke-on-Trent (Meir), Staffs.
Yeadon, Yorkshire.

In Next Month's Issue—

GIVEN AWAY FREE—BEGINNERS DURATION 'PLANE
Designed by **Mr. Howard Boys**
THE SOCIETY OF MODEL AERONAUTICAL ENGINEERS
By **Mr. A. F. Houlberg,** *Chairman*
"JOB DROPS A BRICK." *A Short Story* ... ... **By Arthur Mountstephens**
MODEL AVIATION IN GERMANY. ... ... **By Paul Shroter**
PETROL 'PLANE COMPETITION RULES
—Fully Explained by **Mr. J. C. Smith, S.M.A.E.,** *Comp. Sec.*
"SOME GADGETS FOR YOUR 'PLANE" ... ... **By Mr. S. E. CAPPS.**
AND SEVERAL SPECIAL ARTICLES FOR BEGINNERS
FULL LIST OF MODEL AEROPLANE CLUBS IN THE COUNTRY

Club and Beginners' Number

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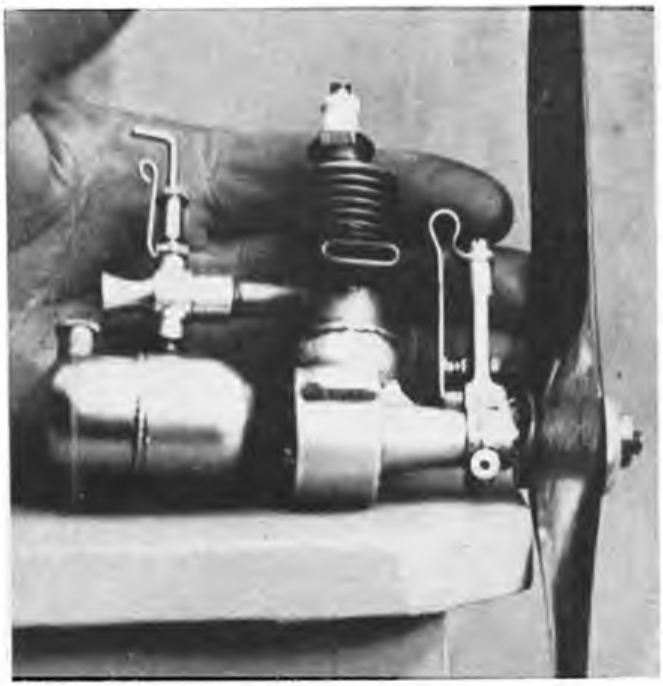
THE OVERHAUL OF MODEL PETROL ENGINES

By LAWRENCE H. SPAREY



The "Giglio" 3 cc. petrol engine—of Italian manufacture.

LIKE their full-size counterparts, small I.C. engines require, after some hours of running, to be dismantled, cleaned and generally overhauled. Foremost among these operation is the process of decarbonising, or "decoking," as it is generally called. Fortunately, the carbon deposit left on the cylinder head and piston of a model engine is usually little more than a dirty, oily substance, which may easily be removed with a piece of rag wetted with petrol. There are several reasons why this deposit is not usually hard and brittle like that of large engines. Our small engines are not subject to such hard and continuous use, and our fuel contains a much larger percentage of lubricating oil, which tends to keep the deposit soft. Furthermore, the cylinder temperature of model engines is not often high enough to carbonise the oil and petrol in the familiar, hard manner. The cooling surfaces are relatively larger on small I.C. engines, and the smaller the capacity of the engine the greater the proportion of radiating surface. This is obvious when we remember that whereas the capacity of any normal engine goes up as the *cube*, the area of the surfaces is governed by the *square law*. This means that if the size of a given engine is doubled, the volume of burning gasses is increased eight times, whereas the radiating surfaces are only increased four times, i.e. eight times the heat must escape from only four times the surface. This is a point which may usefully be borne in mind when designing small engines.

Should, by any chance, the carbon deposit be hard, care is necessary, when removing it, not to scratch the piston, as piston tops, especially on two stroke engines, should be polished, so as not to impede the free flow of the gasses. Alloy pistons, because of their soft nature, are particularly liable to damage, and any scratches on the top should be lightly polished out with fine emery cloth and oil, or, if you are of a patient nature, with metal polish. *On no account must the sides of the piston be scratched or polished with any abrasive material.* Serious leakage of the gasses, and, perhaps, a failure of the engine to start, may result from carelessness in this direction. When the piston has been carefully cleaned and wiped, wrap it in a piece of soft rag, and put it in a safe place. Remember, the piston is the heart of the engine, and it requires careful handling.

In overhauling your engine, I would advise thoroughness, and this means that the whole engine should be dismantled. Please do not use pliers to remove small nuts and screws! If you do you will be sure to damage them. Nothing so quickly makes an engine look old and second-hand as burred screw-heads and rounded nuts. Furthermore, there is a grave danger of stripping small threads, as it is impossible to get the "feel" of a small nut with pliers. Do not spoil the look of an expensive engine for the lack of spanners costing a few pence.

As is common with all working mechanism, wear takes place on small I.C. engines, and the part usually most vulnerable is the crankshaft main bearing. This is a serious matter, as a worn bearing will not only allow the compressed gas to escape from the crankcase, but air will be drawn into the crankcase on the induction stroke. This will dilute the gas charge, and is a prolific cause of irregular running and difficult starting. Should an engine, which has previously been running well, develop either of these troubles, and no obvious cause is apparent, a worn main shaft bearing should be suspected.

Main bearings are usually of phosphor bronze, and are pressed into a housing in the crankcase. Those constructors who possess lathes will find no difficulty in turning up a new bearing, as this is usually only a matter of plain turning and boring. It may be helpful to those that have facilities for such work to mention an easily made reamer, which will ensure that the bearing is bored smoothly and to size. A length of round silver steel rod should be obtained of the exact size of the main shaft. This steel is obtainable in all sizes in 1-64th inch graduations, and also in metric sizes. To form the reamer it is only necessary to file a long, oblique flat on the rod, and to relieve the point, as shown in Fig. 1. The reamer may now be hardened, and the flat touched up on a grindstone. The necessary cleaning-up with emery cloth after hardening will slightly reduce the diameter of the reamer, and ensure a really good fit of the main shaft. These reamers cut particularly true to size, and are much easier to make than the usual type, which requires that the rod be filed to exactly half its diameter.

New bushes and other spare parts for commercial engines may usually be obtained from the makers.

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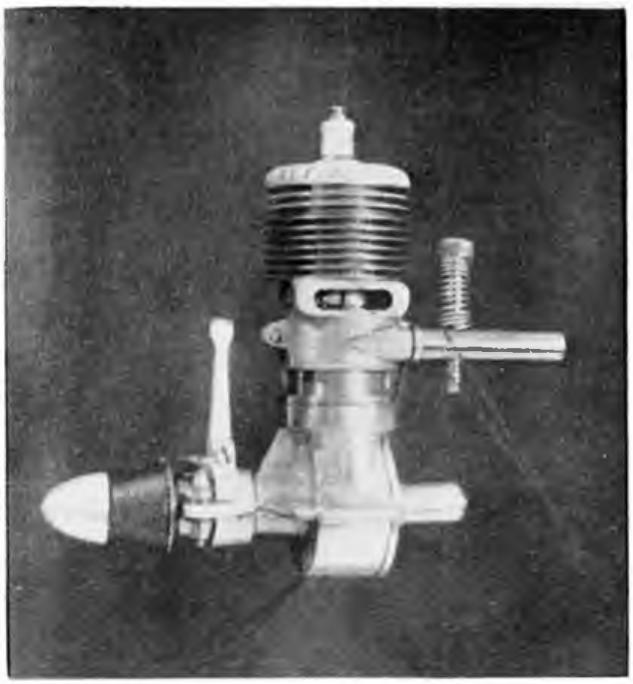

A 9 cc. "home-made" engine, built by Mr. J. Forster, of the Bromley M.A.C. Every part has been made by him with the exception of the plug and the contact points.

The old bushes may be removed by punching out with a hammer and brass drift, but on some engines this is not such an easy matter as it may seem. These engines are often made with the main bearing in two halves. Each half terminates in a collar, and they are entered from opposite sides of the housing. This state of affairs is shown in Fig. 2, and it will be seen that the halved bushes cannot be punched out from either side. If, however, the lower half bush is threaded internally with a suitable tap, and a short bolt inserted, as shown in the drawing, the lower bush may be punched out by means of a thin steel drift, inserted through the top bush.

The pistons and cylinder bores on commercial engines wear for a surprisingly long time, and renewal of these parts is seldom, if ever, necessary. New piston rings may, however, be fitted if the engine has seen a great deal of service. It may be mentioned here that removal of piston rings which are not badly worn is seldom necessary, and the reader is advised to leave them alone, as the risk of breakage is very great. They may be inspected to ascertain that they are free, and not stuck in the grooves. Should they be so, the piston may be soaked in paraffin oil, and the rings freed by very gentle persuasion.

Those constructors with no facilities for making their own parts, can do little beyond buying replacements of any badly worn component. Worn bushes are, as stated, the most serious defect, but slight play in big or little end bearings will do little immediate harm, beyond making the engine somewhat noisy in operation. It must be remembered, however, that loose bearings wear more quickly than well fitting ones, and replacement may be a wise course if an extended period of hard running is contemplated.

Before assembly, all parts should be carefully cleaned in petrol, and wiped dry with a *clean* cloth. On no account may dust or grit be allowed on piston or cylinder bore. These must be scrupulously clean and should be lightly covered with *clean* oil. All other parts should also be lightly smeared with oil before assembly.

It is essential that all joints should be gastight when reassembled. If jointing washers are used they may be cut from writing paper. Goldsize is the most usual jointing compound, but "Seccotine" will make good, gastight joints. It is as well to visualise a model two-stroke engine as a "box-full of compression"—which is anxious to escape at all possible points. Even very small compression leaks are sufficient to cause bad running or non-starting troubles.

Should your engine be of the type which requires a paper washer between the cylinder head and the crank-case, be sure that the washer is cut out for the transfer passage. This is an easily overlooked point, and even "old hands" have been known to forget it.

Leakage is very likely to occur between the sparking plug and the cylinder head itself. This is particularly so with alloy or aluminium heads, where no amount of tightening will render the joint gastight. This is due, in most cases, to the plug having been screwed home too tightly at some time or another, with a resultant distortion of the threads in the alloy cylinder head. The top threads, particularly, are liable to be pulled upwards; consequently, the copper plug-washer cannot seat tightly upon the surrounding surfaces. The cure may be effected by lightly countersinking the top of the plug hole—and the cause prevented by never unduly tightening the plug into the cylinder head.

Each side of the copper plug-washer may be rubbed flat upon a piece of fine emery cloth, placed over a piece of plate glass or other flat surface. This will remove any burrs or irregularities which may be holding the plug from its seating.

FIG. 1.

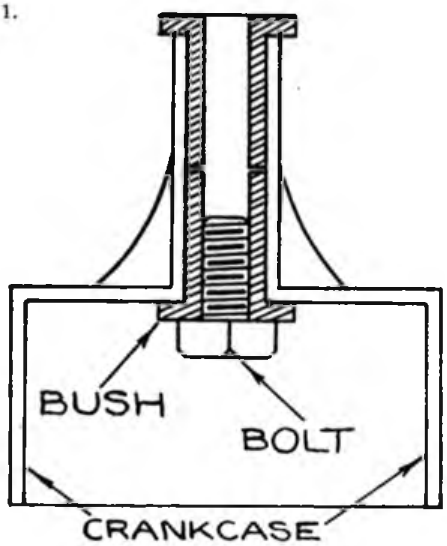

FIG. 2.

Plugs themselves should not be omitted from the overhaul. These miniature plugs are of two types—detachable and non-detachable; the former being of the type which allows the central electrode to be removed for cleaning purposes. In the non-detachable type this is not possible. However good the convenience of the detachable type may seem on paper, they should seldom

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or *never* be taken apart, as it is usually found in practice that the removal of the central electrode. as often as the necessity for cleaning arises, soon destroys the efficiency of the plug. After frequent removal, difficulty is found in keeping the plug gastight, and for this reason the simpler, non-detachable types seem to give the best service.

During the " active " season plugs are usually treated to an occasional washing out with petrol, and a quick brush with a piece of frayed Bowden cable. On the miniature $\frac{3}{8}$ in. and $\frac{1}{4}$ in. plugs, the small aperture between the central electrode and the body of the plug makes cleaning by these ordinary methods rather unsatisfactory.

A good system, which is surprisingly effective, is to fill the plug with liquid metal-polish, and scrub out with a stiff nail brush. The metal polish not only cleans by its abrasive action, but seems, in some measure, to act as a solvent for the carbon deposit. The plug must be thoroughly washed out with petrol after this treatment.

It is a good plan to adjust the spark gap of the plug to be as large as is consistent with good running. On model engines the plug is relatively large in proportion to the engine, and insufficient heat is, at first, generated to heat the plug to the degree necessary to burn or evaporate the oil or petrol which collects upon it. This causes trouble before the engine has got under way, as the oil or petrol causes internal short circuiting of the plug. A large gap between the points helps to heat the plug quickly, and this may prevent certain starting troubles.

Finally, we may overhaul the ignition system. It is not often that the contact-breaker points become actually burnt, as the working life is comparatively short as against that of full-sized engines. The most usual trouble is caused by oil on the contact points, and this is often due to leakage of oil past the main bearing. The usual situation of the contact breaker on model engines makes it easily accessible to oil distributed in this way. Renewal of the main bearing will cure this trouble.

Contact-breaker points should be lined-up so that the surfaces meet squarely and give the best possible contact. Any oxydisation may be removed by drawing fine emery cloth between the partially closed contacts. The break gap should be adjusted to coincide with that of the plug points.

Under ordinary conditions, model I.C. engines distribute a considerable amount of oil upon their surroundings, and it is inevitable that the rubber covering of the ignition leads should often deteriorate. A chronic bout of misfiring on a 5 cc. engine was completely cured by the writer by substituting stout rubber-covered cable for the electric lighting flex previously used. Electric lighting flex is not satisfactory, as not only is the insulation too thin for high tension currents, but the rubber covering itself seems to be of a very poor and plastic nature, and easily dissolved in petrol and oil. Most radio dealers sell a stout rubber-covered cable of about $\frac{3}{16}$ in. diameter, which is very satisfactory for our purpose. All leads which look the least suspicious should be replaced with this.

When your overhaul is completed, run the eigine on the bench. to make sure that everything is in order. but do not immediately remount the engine into its aeroplane. If you do. it will probably stand about exposed to the dust and winter atmosphere. Neglected idleness is often more destructive to machinery than hard work, so that it is advisable to wrap your engine in a clean cloth, and put it safely aside. until a fine day may bring it forth again.

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DURATION

"EAGLE"	WING SPAN	46 inches
	Overall length	33½ "
Price 13/6	Weight	5 oz.
"HAWK"	WING SPAN	39 inches
	Overall length	26 "
Price 10/6	Weight	3½ oz.

GLIDERS

"BUZZARD"	WING SPAN	60 inches
	Overall Length	22 "
Price 9/6	Weight	6 oz.
"SWALLOW"	WING SPAN	39 inches
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ALL PARTS CUT OUT READY FOR ASSEMBLY

"FLASH"	HIGH WING CABIN MONOPLANE - -	**£3 : 15 : 0**
"WASP"	" " " " -	**£3 : 10 : 0**
"HORNET"	" " STREAMLINED " - -	**£2 : 5 : 0**

NEW BRITISH SUPER PETROL ENGINES

"WASP" 6 cc., **£4 : 7 : 6,** WITH COWL AND BACKPLATE **£4 : 19 : 6**

"HORNET" 3·5 cc., **£4 : 5 : 0,** 1939 SUPER SPITFIRE **£4 : 0 : 0**

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THE SOCIETY OF MODEL AERONAUTICAL ENGINEERS

Notes on a Council Meeting of the S.M.A.E., held by permission of the Royal Aeronautical Society in their Library, at 7 Albemarle Street, Piccadilly, on Wednesday, March 8th, 1939, at 7.30.

Dr. Thurston was in the chair.

Owing to a cold, Mr. Cosh was unable to read the minutes. This was attended to by Mr. A. F. Houlberg.

A letter from Mrs. Joan Dray to Mrs. Thurston was read, to which Dr. Thurston had replied, and had sent to Mrs. Dray a cheque for five guineas. At Dr. Thurstone's request, Mr. York told the Council of the circumstances in which Mrs. Dray found herself. He also informed the Council of the vast amount of work done by the late Mr. Hubert H. Dray on behalf of the society. It will be remembered that Mr. Dray was the founder and editor of the *Model Aeroplane Constructor*. Mr. Rushbrooke had called on Mrs. Dray at the society's request. The Council thereupon inaugurated the Dray Memorial Fund, and headed the subscription with twenty-five guineas. Mr. R. T. S. Gillett, of P.M.A.L., handed to the treasurer ten shillings. It was proposed and passed that subscription lists should be sent out to all clubs in aid of this fund.

The entertainment side of the King Peter Cup Competition was next discussed, and a committee was elected to consider the ways and means of dealing with this side of the competition. Dr. Thurston, Messrs. Blunt, Faulkner, Hawkins, Cosh and York were the gentlemen elected to be responsible, with instructions to remain in constant touch with the competition committee.

The question of the discrepancy in the Southport Club's letter to the S.M.A.E and their letter to Mr. Leadbetter was discussed. Mr. Cosh was instructed to write to the Southport Club. It was suggested that transfers of the S.M.A.E. badge be made for the use of decorating models. The Council passed this suggestion, and Messrs. A. F. Houlberg and J. C. Smith were asked to obtain quotations.

The following clubs were affiliated :—

Glasgow M.A.C.	37	members.
Mansfield and District M.A.C. ...	25	,,
Mildenhall M.A.C.	20	,,
Worthing M.A.C.	47	,,
Weston-super-Mare M.A.C.	7	,,
Watford M.A.C.	24	,,

The following clubs were re-affiliated :—

Stoneygate M.A.C.	51	members.
Wembley and District M.F.C. ...	18	,,
Woodford M.A.C.	20	,,
P.M.A.L.	60	,,
Ealing and District M.F.C.... ...	40	,,
Luton and District M.A.S.	22	,,
Brighton and District M.A.C. ...	54	,,
Midland M.A.C.	27	,,

Mr. Hawkins announced that there were no lapses in reaffiliation fees this month.

Alterations to timekeepers and officials of the following clubs were made :—

Cranwell M.A.C. Bromley M.A.C.
Blackpool M.A.C. Woking and District M.A.C.
Newcastle (Staffs.) and District M.A.C.

Applications for petrol grounds were discussed. One by the Barnes and District M.A.S. for a ground at Biggleswade, near Cambridge, was passed. Applications from Luton and Bromley for ground sanctions were referred back, so that the locality might be inspected by the S.M.A.E. An application by the Westwood Club for two grounds to be used for petrol flying was read. The R.A.F. ground at Leconfield was passed, the other was put back for further particulars. Liverpool's application for ground sanction was referred back for further comments. The Bristol club's application for ground sanction was referred back whilst waiting for a map which the club had not supplied. The Council gave Mr. Smith authority to provisionally sanction this ground if the map was forthcoming. Will clubs please note that it is advisable, when applying for ground sanction, to send an ordnance survey of the ground and the surrounding country. The compass points and the prevailing winds should be indicated on the map.

Will officials and organisers of S.M.A.E. decentralised competitions please note that the competitors' S.M.A.E. registration numbers must be quoted on the entry forms.

An indoor R.O.G. helicopter record of 39·5 seconds by J. Morris, of the Edgware Club, was passed.

The meeting closed at 10 p.m. with a vote of thanks to the chair, which had been occupied for the latter part of the evening by Mr. A. F. Houlberg.

H. York, *Hon. Press Secretary.*

Notes on a Council Meeting of the S.M.A.E. held at the Y.M.C.A., Tottenham Court Road, on Friday, April 14th, 1939.

Dr. Thurston was in the chair.

The minutes of the previous Council Meeting were read and confirmed.

Dr. Thurston then read a letter from Lord Wakefield in which once again our patron's keen interest in the work of the society was shown. Lord Wakefield not only promised his assistance in running the King Peter Cup, but also promised £300 toward the Wakefield Cup Fund. Lord Wakefield had also presented to the Society a cheque for £100. This latter amount was to assist the Society, not only in the work involved in organising these competitions, but in conducting its general business. Dr. Thurston read his letter of thanks to Lord Wakefield. The Council wished to place on record their gratitude and thanks to Lord Wakefield. The Council also expressed their appreciation to Dr. Thurston for his efforts on behalf of the Society.

Mr. Rushbrooke, on behalf of the Lancs. M.A.S., presented a cheque for £20 to the Wakefield Fund, the result of his club's raffle. The Council warmly thanked the Lancs. Club.

Mr. York announced that the Fund now stood, with the amounts collected and various promises, at about £180. The Council requested that all moneys toward the Fund should be received by June 12th.

Mr. York estimated that about £60 per head would be needed to cover the trip. He had been in touch with the shipping companies, and had provisionally booked berths. He was instructed to book eight berths sailing on the Aquitania on July 26th, and returning on the Queen Mary on August 9th.

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The Council next discussed the N.G.A. insurance scheme, and considered the advisability of accepting for registration with the Society petrol models insured under that scheme. The Editor of THE AERO-MODELLER was present, and explained to the Council various points in the policy upon which information was desired. Several Council members expressed their views on the subject, and the following resolution was finally put to the vote and carried unanimously: "That the N.G.A. policy be accepted for the purpose of registration with the S.M.A.E., and to accept the Editor of THE AERO-MODELLER'S offer to publicise the S.M.A.E.'s suggested safeguards." The Editor of THE AERO-MODELLER offered to have literature printed, drafted in conjunction with the S.M.A.E., which would be given away by the trade on the sale of petrol engines. This offer was accepted.

The following records were accepted:—

Indoor helicopter: R. W. M. Mackenzie, 1 min. 38 sec.

Indoor stick, R.O.G.: J. K. Bletcher, 4 min. 23 sec.

F. A. Bunce, outdoor R.O.G. O.2 P.1, 1 min. 16.5 sec.

The meeting closed at 11 p.m. with a vote of thanks to the chair.

H. YORK, *Hon. Press Sec.*

PILCHER CUP RESULTS.

MARCH 18TH, 1939.

		Ttl. pts.	*Plugge pts.*
1.	N. Lees, Halifax	354·5	39
2.	R. H. Warring, West Sussex	335·4	38
3.	R. Hinks, Luton	316·75	37
4.	L. Stott, Halifax	297·5	36
5.	H. Hirst, Halifax	269·5	35
6.	I. Hall, Northern Heights	253·0	34
7.	G. W. Day, Northern Heights	219·25	33
8.	J. D. Taylor, Barnes and District	197·9	32
9.	H. R. Jiffs, P.M.A.L.	179·0	32
10.	T. Adams, Barnes and District	160·2	30
11.	— Youhill, Hayes and District	159·0	29
12.	C. S. Rushbrooke, Lancs.	153·5	28

C.S.S.A. (POWER) CUP.

MARCH 19TH, 1939.

1.	— Coxall, Hayes and District	102.4 points.
2.	— Crabbe, Hayes and District	76.4 ,,
3.	— Norman, Junr., Hayes and District	69.0 ,,

GAMAGE CUP RESULTS.

(April 2nd, 1939).

		Average of 3 flights.	*Plugge pts.*
1.	R. N. Bullock, Blackheath	194·88	207
2.	C. Gibson, North Kent	154·36	206
3.	R. Copland, Northern Heights	138·13	205
4.	D. Lees, Halifax	135·56	204
5.	W. W. Preston, Barnes and District	116·16	203
6.	A. G. Bell, Northern Heights	112·83	202
7.	N. Holbrook, Lancs.	109·33	201
8.	G. Suggett, Dartford	106·5	200
9.	H. Austwick, Halifax	106·03	199
	B. Bonner, Kingston and District		
10.	W. Cumber, Barnes and District	104·6	198

PLUGGE CUP POINTS.

Club.	*Pilcher Cup.*	*Gamage Cup.*	*Ttl.*
Halifax	110	590	700
Barnes	84	595	679
Northern Heights	69	596	665
Lancs.	71	588	659
Blackheath	25	519	544
North Kent	—	512	512

THE WAKEFIELD 1939 FUND.

WE give below the full list of donations received up to March 31st.

There are several other promises. Bushey Park M.F.C. and the Hornchurch M.A.C. are both organising dances to raise money. Cardiff M.A.C. and Rugby M.F.C. are devising ways and means of raising money. Woking and District M.A.C. have guaranteed two guineas toward the fund.

In addition to the £15 15s. promised by the Directors of THE AERO-MODELLER, the Balsa Wood Co. Ltd. have promised £10 10s., and the Air League of the British Empire £5 5s.

Time is now getting short, so will all those clubs who have not yet sent in their donations please do so as soon as possible?

	£	s.	d.
S.M.A.E. Dance	15	10	0
Northern Heights Dance	15	0	0
Dunlop Rubber Co.	10	10	0
Blackheath M.F.C. Dance	9	14	3
S.M.A.E. Diaries (Profit)	7	5	5
Lancs. M.A.S. Dance	5	14	4
E. N. Bray, Esq.	5	5	0
Caton Ltd.	5	5	0
Cellon Ltd.	5	5	0
Cranwell M.A.C.	5	5	0
E. Keil & Co. Ltd.	5	5	0
H. H. Price, Esq.	5	0	0
S.M.A.E. Prizegiving	4	4	10
Bradford M.A.C.	4	0	0
"Flight"	3	3	0
Woodford M.A.C.	3	3	0
Hornchurch M.A.C.	2	10	0
W. G. Evans & Sons	2	2	0
Kettering & District M.A.S.	1	15	0
North Kent M.A.S.	1	9	2
Northampton M.A.C.	1	6	0
Stoneygate M.A.C.	1	5	6
Halton M.A.C.	1	5	0
Oxford M.A.C.	1	2	1
W. E. Evans, Esq.	1	1	0
Brighton & District M.A.C.	1	0	0
Shorts M.A.C.	1	0	0
Hornchurch M.A.C.		15	0
Bath M.A.C.		14	6
Wakefield (Yorks.)		14	0
Edgware M.A.C.		11	0
Ossett & District		10	0
H. Boys, Esq.		5	6
R.T.S.G., M.F.			6
	£128	16	1

LANCASHIRE MODEL AIRCRAFT SOCIETY.

Results of the Wakefield Draw, which took place on March 22nd:—

1. C. D. Anderson, Derby 836
2. D. B. Phillips, Chester 299
3. J. Clark, Macclesfield 1007
4. J. Penny, Blackheath 1265
5. Mr. Watkins, Manchester 139
6. I. W. Hall, Potters Bar 1366
7. G. E. Gardner, Birmingham 1109
8. L. Wilson, Sheffield 935
9. G. W. Adshead, Manchester 478

The Committee wish to thank the many friends who helped to make the venture a success in the selling of tickets, etc., as a result of which the sum of £20 has been donated to the Wakefield Fund.

C. S. RUSHBROOKE, *Hon. Sec.*

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THE NATIONAL GUILD OF AERO-MODELLISTS

CONTACT! Members! Contact! Another month has passed and still the applications come rolling in fast, but not quite as I had hoped from clubs. Now come along, club secretaries, and help to build the Guild up. You must surely realise the absolute necessity for all your members to be covered against third party risks. Take a line from Mr. Rothwell, secretary of the Keighley Model Aeroplane Club, who has now got all his members to join the N.G.A. Very fine effort, Mr. Rothwell! Still further, I should like to ask members to enroll all their friends who have not yet joined. Bruce Young, whom some of you no doubt already know as a very keen young aero-modellist, has already done great things in this connection, and has been enrolling members right and left, and I should like to thank him for his efforts.

From another club I have had quite a different kind of letter. The Secretary says: "Is it imperative that each member of the Guild takes a copy of THE AERO-MODELLER for himself each month? If so, I'm afraid that not one would do so." Well, well, well! What a rum idea, and how one-sided! The members of *this* club want all the benefits of our insurance scheme, yet won't take the journal which makes available this absolutely essential protection!

It seems to me that, in effect, the members are really *not* concerned about the value of the insurance unless they can get it on the "something-for-nothing" principle. It should be quite obvious to everybody that the insurance *could* only have been made available by our obtaining the support of all our readers. *and will somebody please tell me why a non-reader should have the same advantage as a regular reader?*

Several members, who must obviously be new readers of THE AERO-MODELLER (or never read my notes, or the Editorial) have written to me asking if the Guild is going to organise any flying meetings. The answer is no! I want to make it clear to all members that the purpose of this Guild is solely to promote safe flying of model aircraft, and to provide its members with third-party insurance. This point was made quite clear in the Editor's introduction of the scheme, and was formally confirmed in a letter to the Council of the S.M.A.E. "Every man to his job, and his own patch of grass," is *my* motto. There are now close on three hundred clubs in this country, the majority affiliated to the S.M.A.E., and they are all organised for the purpose of flying model aircraft; that is what they are for. And the Guild has its purpose, as explained above, and it is going to stick to that purpose.

A word about the application forms: some applicants are still enclosing a sixpenny stamp instead of a postal order. This causes even more work than before, so please remember, postal orders only in future, and also a stamped addressed envelope when you write asking for more transfers. Sorry to keep rubbing this point in, but it is absolutely essential, as otherwise you will not get a reply, or the postage will be deducted from the amount sent in for transfers!

Several members have written in saying that they have not yet received their cards, etc. All cards have been despatched by me, and it appears that a number of these have been lost in the post. I have caused the Post Office to make exhaustive enquiries, but so far they cannot trace any of those which I know have gone astray. If there are any more of you who have applied and not received your cards within a fortnight of application, will you get in touch with me immediately, and I will look into the matter? I must apologise to those of you who have been put to this inconvenience, but, unfortunately, in dealing with the huge number of applications some must inevitably go astray.

Several applications have been received from aero-modellists in other countries, but unfortunately the Guild is unable to offer insurance facilities to anyone outside of Great Britain and Northern Ireland, but it has been suggested that perhaps enthusiasts in other countries might like to be associated with the movement from a friendly point of view and to help in our work of promoting the safe flying of model aircraft at all times.

Those of our readers abroad who wish to join the Guild may do so by payment of the sixpence subscription, and will receive their membership card and transfers, but, of course, they will not be insured. At a later date, if it is at all possible to do so, we shall arrange to extend the insurance to as many countries as possible.

I would particularly draw attention to the second S.M.A.E. report, on page 341. The Council has now approved of the Guild Insurance Policy for petrol 'plane registration, so will all members of affiliated clubs please send in their N.G.A. applications for membership to me as soon as possible? Immediately they receive their membership cards, they should be sent to Mr. J. C. Smith, hon. comp. sec., addressed to 1 Treen Avenue, Barnes, London, S.W., together with full particulars of their models, so that the S.M.A.E. registration numbers can be issued.

Now my space is up. A word of *warning*, "*Fly with care.*" And that does *not* mean fly just where you like. Remember that the insurance is for the benefit of someone *other* than yourself, if you should be so unfortunate as to have an accident. Being insured in no way reduces your responsibility and obligation, as a member of the Guild, to always "fly with care."

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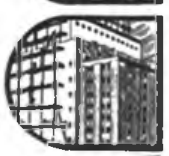

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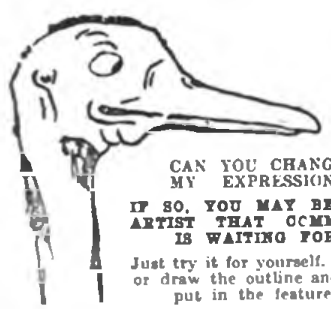

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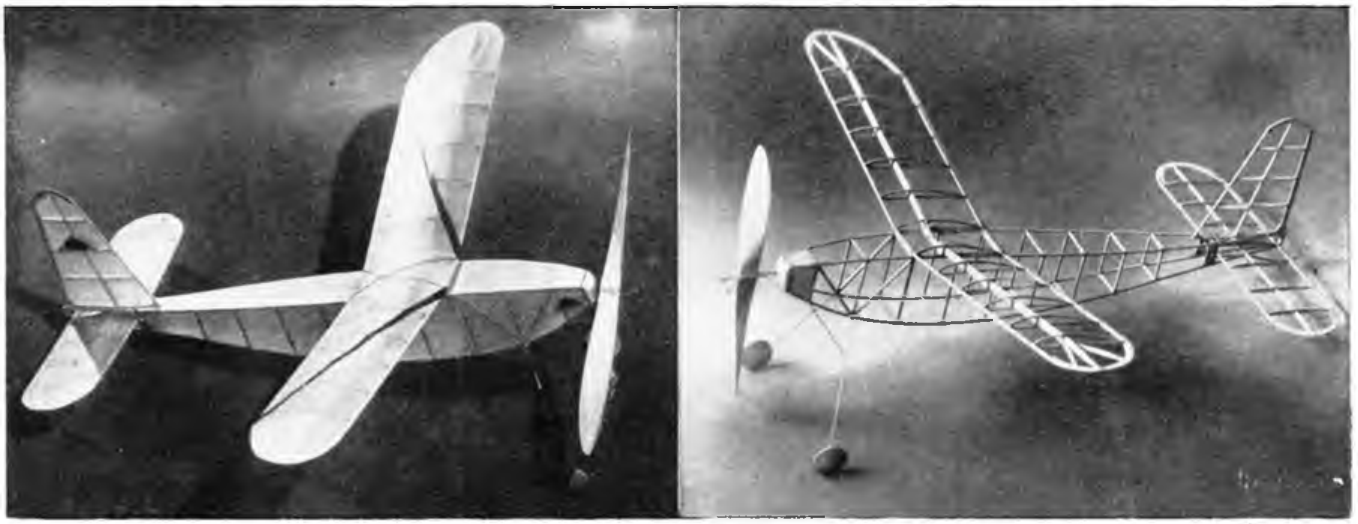
ON TEST—THE CONDOR "CLIPPER"



Report by OUR TEST PILOT

SOMETIMES I have been asked by a reader, "What *is* the difference between a kit costing about 5s. 6d. and one costing about 8s.?" The querist usually adding, "both kits will be of models of a similar size and type, and containing similar material," and more or less inferring that the higher priced kit may not be worth the extra money.

The answer, of course, is the same as that to the question, "What is the difference between a Rolls-Royce and a Morris?" It is a question of *quality* and *design*.

The Condor "Clipper" kit costs 8s. 6d. post free, and is manufactured by Messrs. The Northern Model Aircraft. of 25 Lower Mosley Street, Manchester 2, who supplied a kit taken from stock, from which John Klee built the model illustrated above. Span of the model is 30 in., length 25 in., and weight is 2¾ oz. complete. Not a large model. and although the kit is complete in every way, the question inevitably arises: Is it worth it? My answer is, "Yes."

Not only is the material definitely of first quality, but the performance (which naturally is the result of the *design*) is also of first quality; but before passing to this I must deal with the contents of the kit in some detail. A completely finished airscrew, together with spindle. brass bush. and free wheel. is provided. The main wing ribs are shaped and slotted for the main spar, and only require their centres removing for ultra lightness. Tail and rudder ribs are printed on balsa, a good point being that they are all labelled as to where they go; also ample balsa is "left over" for spare. All balsa is of really good quality. A full-size plan, with detailed instructions, is provided. Bottles of dope, cement. and tissue paste are included. together with necessary "odd bits," and even a balsa cutting tool! Ample tissue is supplied. and a pair of nicely turned hard balsa wheels, which are aluminium bushed.

Building of the kit is quite straightforward. and is well within the ability of young aero-modellists—(John Klee is 15 years old)—but naturally care must be taken to properly finish off all parts. and to align correctly the fuselage and wings.

And now for the flying capabilities of this model. The main wing section is N.A.C.A. 6412, and the tail has a lifting section (and now we begin to see why the glide is so good), which result in a fast climb from the take-off.

This model is certainly of the "sports" type, if I may be allowed a motoring expression; and accordingly it *must* be properly "tuned," if it is to give of its best. I do not mean by this, that the model is *difficult* to trim, but that just as a sports car will be more sensitive to, say, the position of the ignition control; so is this model more sensitive to small variations in trim, and it is advisable to methodically test out the model with only about 200 or 300 turns on the motor, until one is definitely satisfied that the right trim has been found. The motor consists of six strands of ¼ in. rubber, 30 in. long, and this may be stretch-wound up to 700 turns. For "thermal hunting" 8 strands of rubber 35 in. long may be used, taking about 600 turns, when it is claimed by Northern Model Aircraft that a very fast climb will result.

I did not try a motor of this later type, but with the six strand 30 in. motor I tested the model on Easter Sunday (which was a lovely fine day, with good sun and no wind), and obtained several flights of 90 to 100 seconds duration. My last flight with this model was 2 min. 3 sec. O.O.S. So if anybody round Leicestershire finds a "Clipper" with N.G.A. markings on they know whom to return it to!

The makers claim an average performance of two minutes. and my tests would appear to bear out this time. Ideal flying conditions must always influence a model's performance, of course. but "thermals" are not available as early as Easter!

To sum up: The model is simple to build, requires to be "understood." and properly trimmed. and will then give a very good performance. Definitely, a competition model. it should appeal equally well to the "average aero-modellist." who wants a good class job and is prepared to pay for it.

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Above All!

AERO MODELS
CONDOR
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Condor
'CLIPPER'

(*See opposite page, "On Test."*)

The Condor "CLIPPER" has been a flying success right from the start. Never before has any model in its class gained such amazing popularity. Remember, it was introduced only ten months ago, late in the 1938 contest season, yet gained firsts in inter-club contests and finished the season by winning the National Open Biplane Contest (an additional standard wing being fitted for this event) with an average duration of 135.73 sec. for three flights, r.o.g. Abroad, too, the "CLIPPER" has found great favour, and we have received accounts of fine duration flights similar to those recorded by so many customers in all parts of the country:—

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KIT CONTAINS: Full-size detailed plan and instructions (printed black on white). Finished propeller, Paulownia cut-out ribs, Paulownia wheels, tail and fin ribs printed on "NORMAC" graded balsa, white and coloured tissue, cement, dope, paste, rubber, insignias, and even a balsa cutting tool. The most complete kit marketed.

SPECIFICATION: Wing span 30 in., length O.A. 25 in., weight 2.75 oz.

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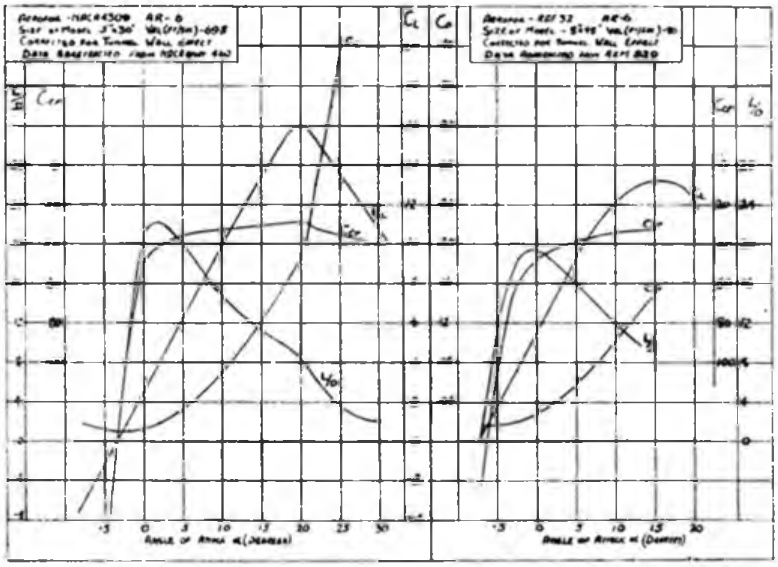

AEROFOIL SECTIONS—III

By J. W. B. CRUICKSHANK

IN this third article I propose to show readers how to select an aerofoil section for a particular purpose.

We will assume that we wish to compare the two aerofoils N.A.C.A. 4309 and R.A.F.32 to suit the following requirements. We wish to build a model powered with ¼ h.p. engine, weighing 4 lb., and to fly at 25 m.p.h. (36·6 f.p.s.) and to have a stalling speed of 12 m.p.h. (17·6 f.p.s.).

For convenience we will assume an aspect ratio of 6, as the curves given are to an aspect ratio of 6, although in actual fact an aspect ratio of greater than 6 is more suitable for model work.

We really wish to compare the performances of the two wings and to find which gives the better performance.

First, we will take the model as having a wing with an aerofoil section R.A.F. 32.

Then, looking at the curves, we see R.A.F. 32 has a value of C_L max. of 1·32.

$$\text{Now } L = C_L \, P_{/2} \, S V_2$$

$$\therefore S = \frac{L.}{C_L \; P_{/2} V^2}$$

$$= \frac{4}{1{\cdot}32 \times P_{/2} \times (17{\cdot}6)^2}$$

$$= 5{\cdot}8 \text{ square feet of wing area.}$$

That is, we require 5·8 square feet of wing area for a stalling speed of 12 m.p.h. for an R.A.F. 32 wing.

Now for the aircraft to fly at 25 m.p.h. we will require a value of C_L given below.

$$C_L = \frac{4}{1{\cdot}32 \times P_{/2} \times (36{\cdot}6)^2}$$

$$= {\cdot}305.$$

Now, looking at the curves, we can see that the angle of attack, which gives $C_L = {\cdot}305$ gives a L/D ratio of 16·6.

$$\therefore \text{ The wing drag } = \frac{4}{16{\cdot}6}$$

$$= {\cdot}24 \text{ lb.}$$

Now, the horse-power required to fly a model at any given speed is obtained from the following equation :—

$$HP = \frac{D \, V}{375}$$

where D = Total drag.
V = speed in m.p.h.

$\therefore$ in our case

$$\text{h.p. required} = \frac{{\cdot}24 \times 25}{375}$$

$$= {\cdot}016$$

That is, assuming an air-screw efficiency of 75 per cent we have ${\cdot}2 \times {\cdot}75 - {\cdot}016 = {\cdot}134$ h.p. to overcome the remainder of the drag of the aircraft, and to give a reserve for climb.

For the model with wings of aerofoil section N.A.C.A. 4309 :—

$$C_L \text{ max.} = 1{\cdot}60$$
$$S = 4$$

$$= \frac{1{\cdot}60 \times P_{/2} \times (17{\cdot}6)^2}{4}$$

$$= 4{\cdot}78 \text{ square feet.}$$

Similarly, at 25 m.p.h. (36·6 f.p.s.).

$$C_L = \frac{4}{P_{/2} \times 4{\cdot}78 \times (36{\cdot}6)^2}$$

$$= 0{\cdot}353$$

Again, referring to the curves, we find that at this value of C_L we have a L/D ratio of 22·2.

$$\therefore \quad D = \frac{4}{22{\cdot}2} = {\cdot}18 \text{ lb.}$$

$$\therefore \quad \text{h.p.} = \frac{{\cdot}18 \times 25}{375}$$

$$= {\cdot}012$$

Which means that we have an excess of ${\cdot}15 - {\cdot}012 = {\cdot}138$ h.p. to overcome the drag of the rest of the model, and for climb.

Now the rate of climb is given by the following equation :—

$$\text{Rate of climb} = \text{Reserve h.p.} \times \frac{33{,}000}{W.}$$

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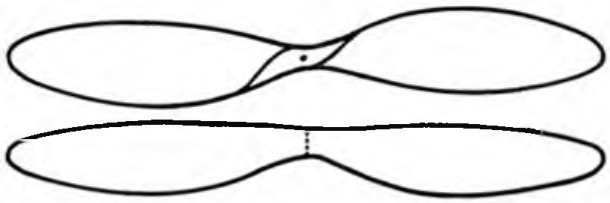

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8 inch	1-1/8 in.	1 2
9 inch	1-5/16 in.	1 4
10 inch	1-1/2 in.	1 6
11 inch	1-5/8 in.	1 9
12 inch	1-3/4 in.	2 0
13 inch	1-7/8 in.	2 4
14 inch	2 inch.	2 8
15 inch	2-1/8 in.	3 0
16 inch	2-1/4 in.	3 3
17 inch	2-3/8 in.	3 6
18 inch	2-1/2 in.	3 9

5 in. to 11 in. add 3d., 12 in. to 18 in. add 4d., for post and packing
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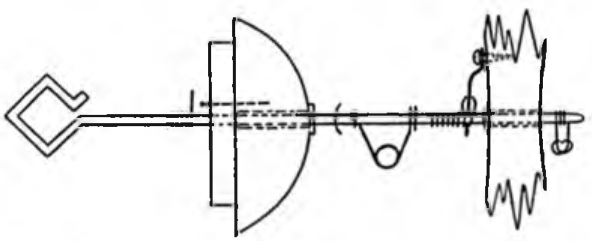

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Now, assuming that the drag of the remainder of the model at 25 m.p.h. comes to ·8 lb. This gives a total drag of 1·04 lb. for the model with the R.A.F. 32 aero foil.

$$\therefore \text{ HP.} = \frac{1{\cdot}04 \times 25}{375} = {\cdot}069$$

$$\therefore \text{ Reserve h.p.} = {\cdot}15 - {\cdot}069 = {\cdot}081$$

$$\therefore \text{ Rate of climb} = \frac{{\cdot}081 \times 33{,}000}{4} = 668 \text{ ft. per minute.}$$

Now, for the model with the N.A.C.A. 4309 aerofoil—

$$\text{Total drag} = {\cdot}8 + {\cdot}18 = {\cdot}98 \text{ lb.}$$

$$\therefore \text{ h.p.} = \frac{{\cdot}98 \times 25}{375} = {\cdot}065$$

$$\text{r.h.p.} = {\cdot}15 - {\cdot}065 = {\cdot}085$$

$$\therefore \text{ Rate of climb} = \frac{{\cdot}085 \times 33{,}000}{4} = 700 \text{ ft./min.}$$

Now, summarising these results in tabular form, we can compare the two aerofoils.

	Wing with RAF 32	Wing with N.A.C.A. 4309
C_L max.	1·32	1·60
C_D min.	·0156	·0094
L/D max.	19·4	22·3
Wing area	5·8 sq. ft.	4·78 sq. ft.
C_L at 25 m.p.h.	·3052	·353
L/D at 25 m.p.h.	16·6	22·2
D at 25 m.p.h.	·24 lb.	·18 lb.
Drag of rest of model	·8 lb.	·8 lb.
H.P. required	·069	·065
Reserve h.p.	·081	·085
Rate of climb	668 ft./min.	700 ft./min.

From this comparison we can see that N.A.C.A. 4309 is the more suitable for these requirements.

There are no hard and fast rules to say what is the best of all aerofoils, as some aerofoils are more suitable for some requirements, but not for others.

However, if modellers follow the method given, various other sections may be compared under other conditions.

I have included this month profiles and characteristics of three N.A.C.A. sections and the well-tried R.A.F.32.

Data on N.A.C.A. sections are not easily obtainable for modellers in this country, and so I have included three of the most suitable for models. These give a good idea of the effects of the position and amount of the maximum camber of the centre line, as N.A.C.A. 4309, N.A.C.A. 6409, N.A.C.A. 6512, and R.A.F. 32 have a maximum camber of the centre line of 4 per cent, 6 per cent, 6 per cent, and 5 per cent respectively.

Symbols used in this article are :—

C_L = Lift coefficient.
C_D = Drag coefficient.
S = Wing area.
P = Standard density of air = ·002378 slugs cu. ft.
V = Speed in ft./sec. unless otherwise stated.
L = Lift.
D = Drag.

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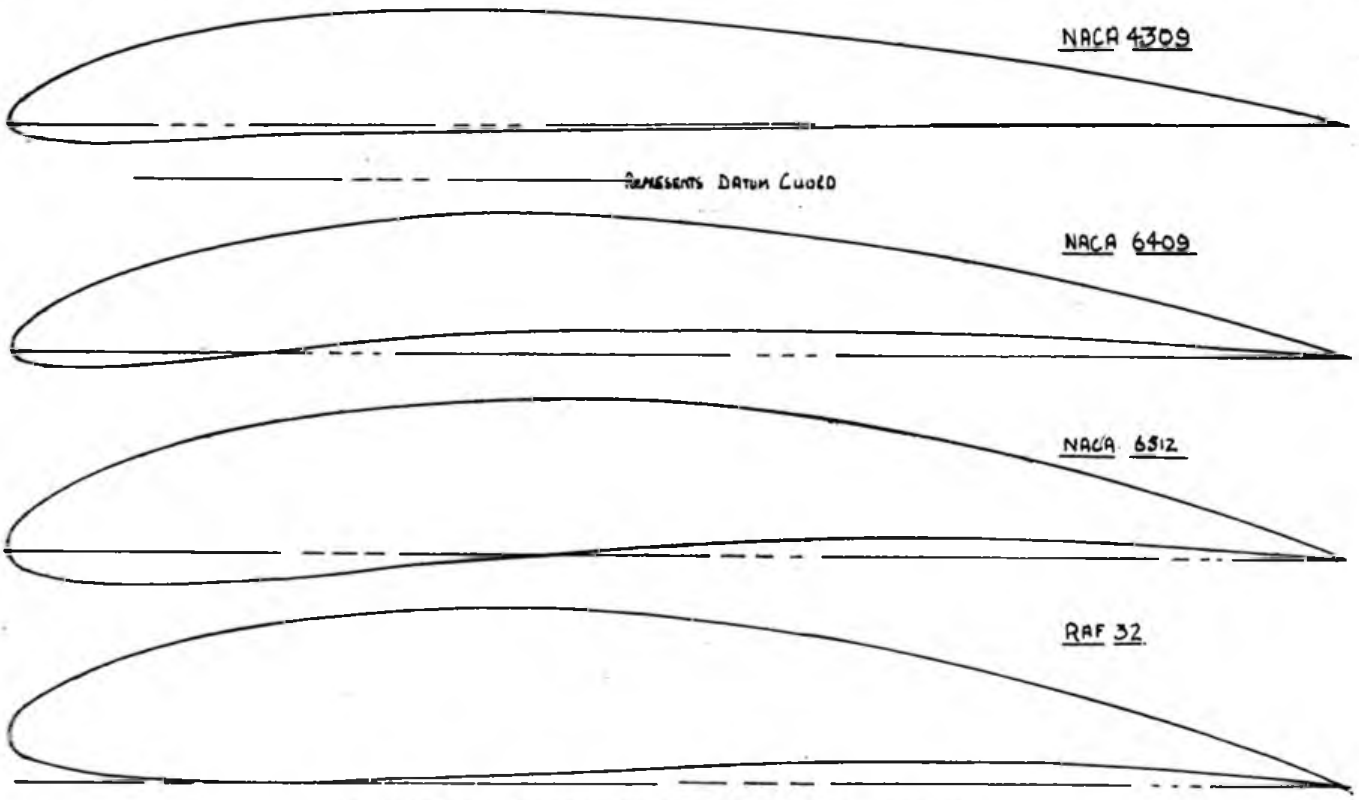

PROFILE ORDINATES IN PER CENTAGE OF CHORD.

N.A.C.A. 4309.			N.A.C.A. 6409.			N.A.C.A. 6512.			R.A.F. 32.		
Station.	Upper.	Lower.	Station.	Upper.	Lower.	Station.	Upper.	Lower.	Station.	Upper.	Lower.
0	0	0	0	0	0	0	0	0	0	3·42	3·42
1·25	1·98	− ·94	1·25	2·06	− ·88	1·25	2·57	− 1·34	1·25	5·56	1·96
2·5	2·8	− 1·21	2·5	2·96	− 1·11	2·5	3·56	− 1·82	2·5	6·52	1·50
5	4·09	− 1·37	5	4·30	− 1·18	5	5·02	− 2·26	5	7·84	·88
7·5	5·05	− 1·36	7·5	5·42	− 1·08	7·5	6·13	− 2·43	7·5	—	—
10	5·86	− 1·26	10	6·31	− ·88	10	7·06	− 2·45	10	9·72	·30
15	7·08	− 1·01	15	7·78	− ·36	15	8·57	− 2·27	15	11·02	·08
20	7·88	− ·76	20	8·88	+ ·17	20	9·69	− 1·91	20	11·92	0·00
30	8·5	− ·5	30	10·13	1·12	30	11·07	− ·98	30	12·98	·30
40	8·29	− ·43	40	10·35	1·65	40	11·56	− ·06	40	13·10	·70
50	7·65	− ·29	50	9·81	1·86	50	11·29	+ ·71	50	12·46	1·10
60	6·71	− ·15	60	8·78	1·92	60	10·35	1·21	60	11·06	1·46
70	5·46	− ·05	70	7·28	1·76	70	8·76	1·39	70	9·10	1·60
80	3·95	0	80	5·34	1·36	80	6·54	1·24	80	6·56	1·46
90	2·16	− ·05	90	2·95	·74	90	3·68	·72	90	3·60	·92
100	0	0	100	0	0	100	0	0	100	0·12	0·12

CO-EFFICIENTS RELATE TO AR 6.

N.A.C.A. 4309.				N.A.C.A. 6409.				N.A.C.A. 6512.				R.A.F. 32.			
A°	CL	CD	L/D	*A*°	CL	CD	L/D	*A*°	CL	CD	L/D	*A*°	CL	CD	L/D
− 3·6	000	·0098	0	− 5·9	000	·0110	0	− 6·2	000	·0119	0	− 7·0	·022	·0158	1·39
− 1·5	·142	·0104	12·5	− 3·5	·185	·0120	14·5	− 3·0	·26	·014	16·5	− 4·8	·194	·0156	12·4
− ·5	·22	·011	16·0	− ·2	·42	·0194	21·6	− ·4	·42	021	20·6	− 2·55	·354	·0196	18·2
+ ·5	·295	·0136	21·5	+ ·4	·47	·0220	21·2	+ ·6	·49	·025	20·2	− 0·5	·52	·0268	19·4
1·8	·39	·0175	22·3	1·6	·56	·0268	20·5	1·8	·58	·030	19·5	+ 1·5	·67	·0362	18·5
4·0	·555	·028	20·7	3·8	·74	·0390	18·6	4·2	·76	·046	17·4	5·3	·956	·061	15·7
8·0	·85	·053	16·4	5·0	·805	·0462	17·3	7·0	·945	·065	14·8	9·3	1·174	·094	12·5
12·0	1·15	·0888	13·0	7·0	·95	·062	15·2	10·0	1·14	·092	12·6	13·15	1·304	·1328	19·8
14·0	1·28	·10	11·7	10·5	1·20	·095	12·6	14·0	1·4	·134	10·4	16·85	1·316	—	—
18·0	1·52	·16	9·6	14·0	1·42	·134	10·6	16·0	1·52	·160	9·6	20·5	1·188	—	—
20·0	1·60	·188	8·3	20·8	1·68	·238	6·8	22·8	1·75	·27	6·5	—	—	—	—
24·0	1·41	·346	4·0	22·0	1·66	·269	5·9	26·0	1·70	·354	5·0	—	—	—	—

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THE HAWKER

An 80 inch Petrol Engined Scale Model

By D. J. MILLER

ALTHOUGH this model has so far been in the air only seven times, and cannot be said to have started its flying career properly as yet, it embodies features that are worth very wide dissemination among aero-modellers, as they will enable builders to go ahead with the reproduction of what have up to now been practically impossible prototypes. The model is reasonably stable, and capable of taking a heavy crash without damage. The full number of its virtues and vices I am still waiting to discover this summer!

It is true to scale except that the tail area has been slightly increased, the wing section altered, and the propeller (14 in.) would require to be 22 in. to be true scale size. In building it the weight must be kept low by every possible device, and by "low" I mean as near the ground as possible, as well as light.

The drawings I have tried to make as near self-explanatory as possible, as far as space would permit, and builders will not make serious differences if they use their initiative where some detail seems obscure—all the essential points at least have been given the requisite prominence. And so to the building of it.

Fuselage.

The fuselage is built up in a plywood jig upon which the side elevation outline is accurately drawn about the centre line shown. The positions of the formers A to O are then marked in square to the centre line, and the whole interior of the sheet of plywood is then cut away to within $\frac{1}{8}$ in. of the outline. Sawcuts are then made to hold the formers in their correct positions. These formers are best made altogether from the dimensions determined from (*a*) the side elevation, and (*b*) the plan of the fuselage which may be drawn out on the other side of the jig before it is cut away. Notching the formers is a tedious job—the worst of all, but by stretching a piece of string kept tight by a piece of rubber strip from nose to tail after a couple of stringers have been fitted, the positions of 40 $\frac{3}{32}$ in. sq. spruce stringers can be made most accurately, so as to preserve clean lines. It is worth while making a notching tool. The stringers are reduced to one-third the number underneath where the plywood and balsa covering goes. The model is covered in birch ply from D forward, and along the top beside the sliding window. The rest is covered with two layers of $\frac{1}{32}$ in. balsa sheet. Casco glue was used throughout, and the covering job allowed to proceed slowly. The nose presents most difficulty. It is essential to cover it in plywood, which is slit and "petalled" down to glue together on the stringers which, at the nose, are about 1—1$\frac{1}{8}$ in. apart. It is then covered with sheet balsa glued over and sanded to a smooth finish when dry. After carefully sanding and doping silver it has a distinct metallic finish—as it should be. The panels are revealed by the joints in the sheet covering, and are marked in the plan.

Do not forget to fit in the radiator tube, which is made from $\frac{1}{32}$ in. ply, and located in the formers shown (C, D, E, F). This must be done before stringers are started. The top section of former C must be inserted at the start and provision made to slit between the two, so as to cut away the motor carrier after all else is finished.

The Motor-Carrier (Figs. 1, 2 and 3).

When this has been cut away from the main body it may pull out of shape a little. This is immaterial, as it is pulled back by being fixed firmly down to the oak engine bearers later built in. Do not forget the screw

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HURRICANE

anchorages (P). The method of holding the whole lot into the fuselage when the engine has been assembled seems flimsy, but it is remarkably effective and strong. Very tight rubber bands hold it down, resist vibration, and, providing not too much rubber is wound on, allows the engine to be thrown clear without damage. This is not conjecture—it was demonstrated on the first flight. The wings are fixed in the same way.

The Wings and Wing Roots.

The formers D, E, F, carrying the wing root, are cut $\frac{1}{2}$ in. or more oversize about the root projections. The wing section is the well-known Gottingen 387, full particulars of which are given on page 238 of the March issue of this paper, and are not repeated here. When two 16 in. ribs are fitted up against either side of the wing root former ends at the correct incidence ($7\frac{1}{2}$ degrees), $\frac{1}{8}$ in. stiffening strips may be glued right across from side to side on the formers and the roots ply-covered. Take care with all joints. Small ($\frac{3}{8}$ in.) nails may be used to pin up while the glue is drying, but these are quite useless when it has dried. Do not forget the four blocks which will hold the brass wing root tube. Only a thin light tube is necessary here. Fillet with little chunks of soft block balsa. The wings are built as shown, and a piece of reed cane (not rattan) is bent over a gas jet, quenched whilst hot under water to give the wing the correct dihedral. About 2—3 inches is passed into the tube, and the remaining 7—8 inches goes into the wing. The assembly is very rigid when the rubber clips are fitted unobtrusively, front and rear. A small round peg locates the wing at the rear.

Tail Assembly.

This is built up about a hollow, built up root fairing of soft balsa, and should present no difficulty—drawings and photographs will explain. Photograph (*a*) shows i.e. covered, and (*b*) uncovered, with $\frac{1}{32}$ in. sheet balsa.

Undercarriage.

Required for this is some light steel sheet, aluminium sheet, and some light tubing. I used the legs of an old camera tripod, for wing root and undercarriage compression members. The photographs (*a*) and (*b*) will give some idea of the assembly, and the diagram (No. 4) will, I think, be clear enough. Size will be taken, of course, from the side elevation. The springs in the tube should just move with a 5 lb. weight upon them, and fit into the tube loosely. The two fixed supports should be

dished, i.e. hollowed to a curved section to obtain greater rigidity. This is important, as mild steel bends, of course, very easily.

Screen and Hood.

This is cut from $\frac{1}{32}$ in. thick sheet aluminium with a bow saw. It should be produced first in paper or thin pliable card. A sheet of celluloid is clipped inside, and the hood slides back.

Engine Mounting and Transmission.

Look at the photographs and the drawings. Then, perhaps, I will only need to pass on a few hints. You will have to get one or two items made by a turner, but they are simple and cheap. The female end of the transmission bolt, J (Fig. 6) is locked on to the threaded part of the prop. shaft with the prop. nut, and a flat is filed on it to facilitate making a tightly bolted fit. Into this goes the T piece of silver steel, which takes the drive. There should be not more than a few thousands clearance, and it should be an easy fit. Fill with grease. The fit of the copper jacket sweated on to plate A (Fig. 2) is important, and the bearing should be firmly enclosed. The brass plate A is screwed to the oak member very carefully, so as to centre the prop. shaft and the engine bearer made to carry the engine on the same centre. If you are doubtful about getting the job done accurately get some practical advice, for although I can vouch for the design making a most negligible effect on the speed of the engine when accurate, I don't know what an inaccurate one wouldn't do to an engine. A certain amount of error is unavoidable, and it is in view of this that I evolved the design—to cancel out the bad effect of slight misalignment, as well as to let the assembly take the bump and not the engine. Don't solder the copper jacket E on to A too thickly, it only just needs to hold, so that any serious misalignment will fracture the solder and tell you what is wrong.

(*Continued overleaf*).

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FLYING SCALE

Fig. 26.

IN this article I want to say something about the driving units, that is, airscrews, motors and gears. The actual rubber motor is quite simple, but it can be arranged in one or more skeins depending on the propeller and gears, if used. However, let us deal with a single skein of rubber first. The length and number of strands depends on the model and its propeller, and will have to be found by experiment in the first place. I have often been asked how the two ends of a piece of rubber should be joined, so I have made a sketch to help. The two ends should be tied together in a reef knot and then bound with " silko " or thread. This binding is best arranged in the form of two clove hitches each side of the knot, and is shown in Fig. 26. This, by the way, should be done before lubricating the rubber. Loop the rubber into the number of strands required, and put a bobbin on each end, holding it in place with a small rubber band, stretched and wound on. The length of the rubber is usually greater than the distance between the motor hooks, and to prevent it dangling and sliding about in the fuselage when unwound it is sometimes twisted on itself or " plaited." To do this you take the motor in half or one-third the number of strands, but twice or three times as long respectively, and wind it up a few turns. The number of turns is best found by experiment, and the rubber is folded into two or three to give the correct number of strands for the motor and the ends put on to bobbins. You must keep the motor stretched a little bit while doing this, and then when you let go the motor will twist itself up sufficiently to shorten itself.

The next thing to find out about a skein of rubber is how much you can wind it up. To do this you must measure the length of the skein untwisted but folded into the correct number of strands and find its weight. The formula then is $BT = \frac{5 \times L^{1.5}}{\sqrt{W}}$ = number of turns that will just break the rubber. It is much best, though, never to put on more than 80 per cent of this number, so the number of turns is now found by $NT = \frac{4 \times L^{1.5}}{\sqrt{W}}$. To get $L^{1.5}$, or if you like, $L^{3/2}$ measure the length of the motor in inches, cube it, and then find the square root. (And you don't take away the number you first thought of!) $\sqrt{W}$ is the square root of the weight in oz.

The next thing is the method of using the rubber motor. We know it is stretched along the fuselage in the ordinary way from a hook at the front to a hook or peg at the rear. The point to be considered is whether or not to use a " motor stick." If not, we must make the fuselage strong enough to stand the strain of the motor, but it is usually strong enough in any case. However, the " motor stick " has a few advantages. One is that you can wind up your motor before putting it in the fuselage, and then if it should " bust " it will not wreck the fuselage. Another thing is that you can make

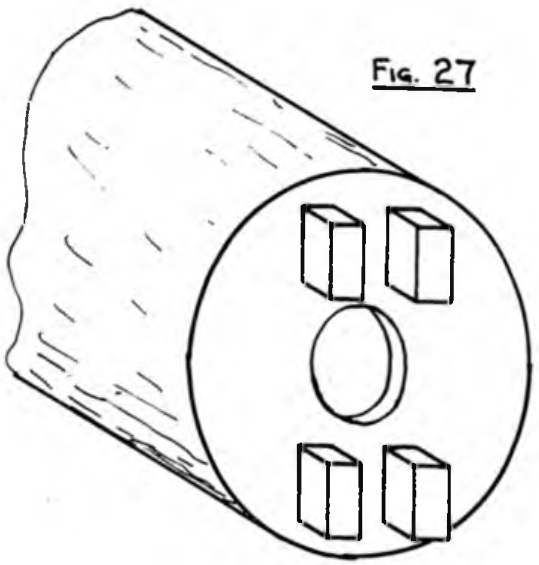

Fig. 27

the " stick " in the form of a tube with the rubber inside, so that you do not get lubricant all over the fuselage structure and covering. I do not think a motor stick worth while with a flat-sided fuselage, but with a rounded fuselage with a lot of stringers I say fit a motor

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THE " HURRICANE."—*Continued.*

A small hole 1 in. diameter cut on a level with the plug and cylinder head, will provide you with enough air to cool it, if not too much. Make sure that you get the exhaust clear, and fit an air intake tube. I found that a 5 in. tube made no difference to the running of an Ohlsson engine. So now if you don't make a Hurricane you can go ahead and hide your engine away with a little air supply and model practically any type of engine upon which your fancy alights. True scale modelling is a step nearer when plugs, wires, pots, etc., don't shriek " two stroke " from the top of the fuselage of an imposing looking model of a liner.

Performances.

The model weighed 8 lb. with an Ohlsson engine. This weight is not too much providing the flying trim is accurate, and that 4,000 r.p.m. with a 10 in. pitch prop. is available, although the take-off will be long. I have no doubt whatever that anyone attempting to build this machine will be able to produce a machine weighing no more than 6 lb., and a 6 cc. engine will take care of that. The excess weight was due to the fact that the whole machine was built up experimentally from provisional drawings, and consequent adjustment and modification of building methods ensued in a considerable increase in weight.

The Gottingen wing section lowers the centre of resistance to about ¾ in. below its proper place, and about a degree or so of negative incidence may be found necessary, together with about the same amount of up thrust. Owing to the fact that the C.G. is only an inch or so below the centre of lift the model is very susceptible to torque variations, and the dihedral must be kept large.

Scale plans of the " Hurricane " petrol 'plane are on pages 354, 355 *and* 358.

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MODELS By HOWARD BOYS

tube every time. For small models the tube could be made from 1-64 in. sheet balsa covered with paper, and for large models use $\frac{1}{32}$ in. sheet covered with silk. To make the tube, soak the balsa in boiling water, in the copper on wash day is a good idea, until it is thoroughly hot, and then borrow the broom (to be on the safe side !) and wrap the balsa round the handle. When it is dry lap the two edges about $\frac{1}{8}$ in. and glue them together. Make the tube as large as you can get in the fuselage. For the rear end make a disc from two pieces of balsa stuck together with grains crossing, with a large hole to pull the rubber through. Glue some blocks of balsa on the back, so that a peg through the end of the rubber does not turn round. You can see this in Fig. 27. The front end should be glued to the nose of the fuselage, which should be removable. A plug can be used in the nose to take the propeller shaft. (See Fig. 28).

Another form of motor-stick is shown in Fig. 29, and consists of a square or oblong stick of balsa, with a hook at the rear and propeller shaft on a bearing at the front.

The next thing to think about is whether or not to use gears. I do not believe the use of gears is at all well understood, so I will explain all about them. People will tell you that if you use twin gears you can put more turns on your rubber. So you can, but the torque or effort to turn the propeller is less, and there is the added weight of the gears. The whole point is that a certain amount of rubber will store a certain amount of energy, and you can use this energy quickly or slowly. Suppose you have enough rubber to give you an average of half-horse power for one minute, the same rubber will give give you one horse-power for half a minute. So no matter what you do with the gears you cannot get more power from the motor, as some people seem to think. What you can do with gears though is to put more rubber in the model to get a longer power flight, or get practically the same performance with a shorter motor

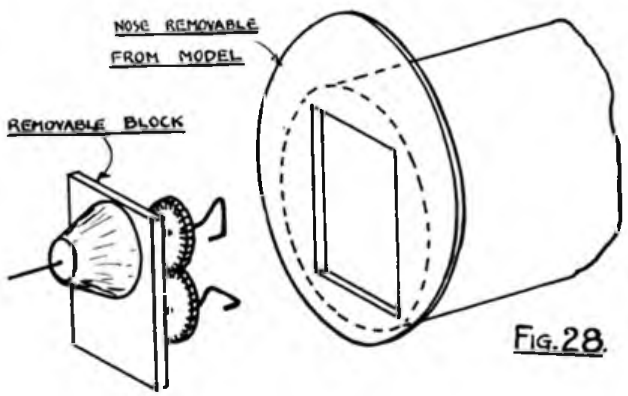

FIG. 28.

using the same propeller. For instance, if you have a single skein motor of 8 strands 18 in. long you can use twin gears with a six-strand skein 12 in. long on each hook, still using the same propeller, with very little difference in performance. Alternatively, you could use 6 strands 18 in. long on each hook with a gain in duration of power flight due to the increase in the amount of rubber.

What I consider most important though is that you can use a shorter motor, which helps to keep the C.G. in the right place. The gears will pay for themselves

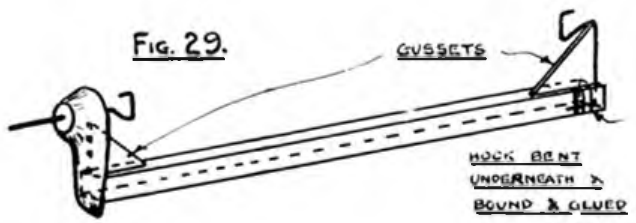

FIG. 29.

in the less weight that needs adding to the nose of the model to make it balance correctly. Now here is another point about gears. Suppose you have a single skein motor 18 in. long, driving a 10 in. dia. prop., if you split the motor into two skeins 18 in. long with half the strands on each, a prop. of about 7½ in. dia. would give you somewhere near the same performance. In this way you can get a reasonable performance from a prop. that is somewhere near scale in diameter. Another successful way of using gears, is to gear the propeller to go faster than the rubber. This enables you to use a smaller prop. The only disadvantage of using gears is that they are not 100 per cent efficient.

I am sure that by now you will all want to make a gearbox, so I will tell you how to do it. A good one is shown in Fig. 30. For a small model use 20 s.w.g. shafts, and for a larger model use 14 s.w.g. shafts. Gear wheels will probably need drilling out to take a 14 s.w.g. shaft. The bearings can be made from some thick gauge brass tubing $\frac{1}{8}$ in. dia. outside, and should be drilled out to take the 14 gauge shafts. You can make a drill to do this from instructions given in a previous article. With this drill put a hole in a piece of 20 or 22 s.w.g. sheet brass, and put a piece of wire through with a gear wheel threaded on. Then with another gear wheel on the drill meshing nicely with the first gear, drill another hole. Now with the gears on two shafts through the holes, try them to see that they run freely without too much slack. If they are not very good, try two more holes. Have patience with the job until you get them

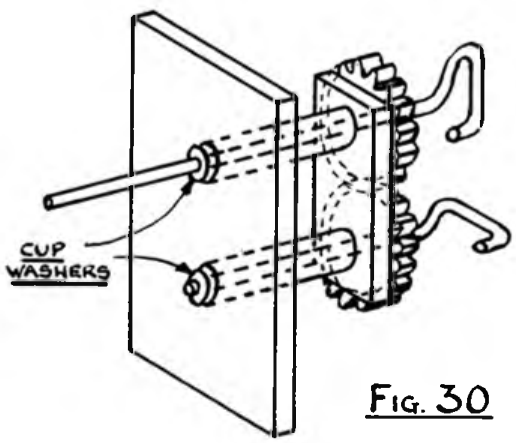

FIG. 30

right, and then drill another piece of brass plate, using the first one as a pattern. Then drill these holes out to $\frac{1}{8}$ in. dia. to fit the brass tube. Cut two pieces of tube about $\frac{1}{2}$ in. long and solder them into the plates, leaving them projecting about $\frac{1}{32}$ in. each end. Now bend the ends of the shafts to form hooks and solder on the gear wheels. Thread the shafts through the brass tubes and solder on cup washers. Leave a little play endways but adjust the washers so that the gears are level with each other. One shaft should be long for the propeller and the other should be cut short just clear of the washer.

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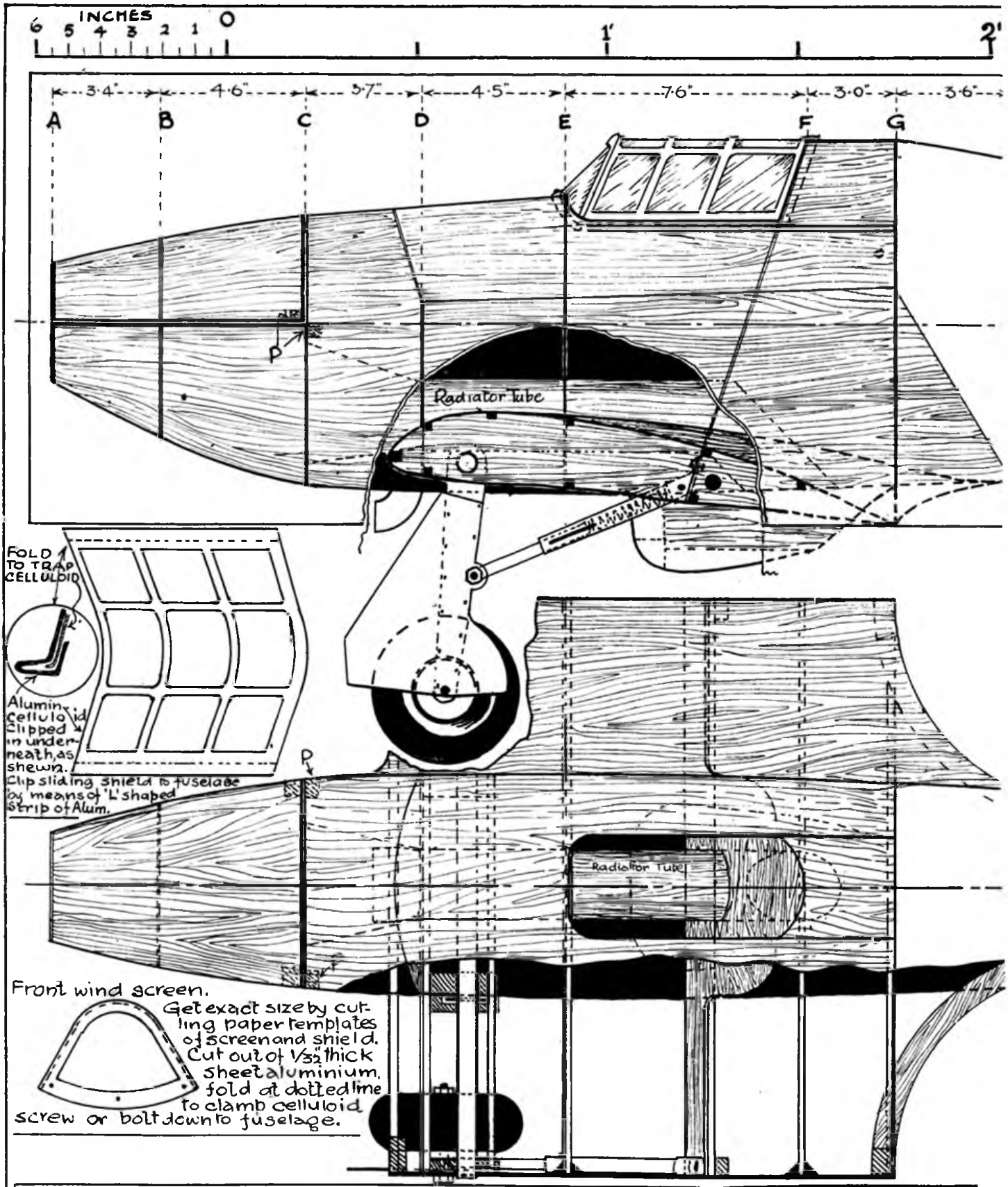

DRAWING IS MADE TO SCALE LINE ABOVE WHICH MAY BE RELIED UPON TO CLOSE LIMITS. FORMERS ARE ONLY SHEWN IN HALVES. STRINGERS ARE NOT SHEWN - SEE INSTRUCTIONS FUSELAGE IS BIRCH PLY & BALSA COVER'D TO 'G' REMAINDER - SILK

PETROL DRIVEN SCALE MODEL (2" : 1') OF THE HAWKER HURRICANE

SOME DETAILS OF ORIGINAL

H.P. 909-1050 MERLIN

Span	40 Ft.
Length	31' 5"
Span of Tailplane	11' 0"
Wheel Track	7' 10"
Area of Planes	231 sq ft.
Propellor Diam.	11' 6"
Weight	- Considerable.

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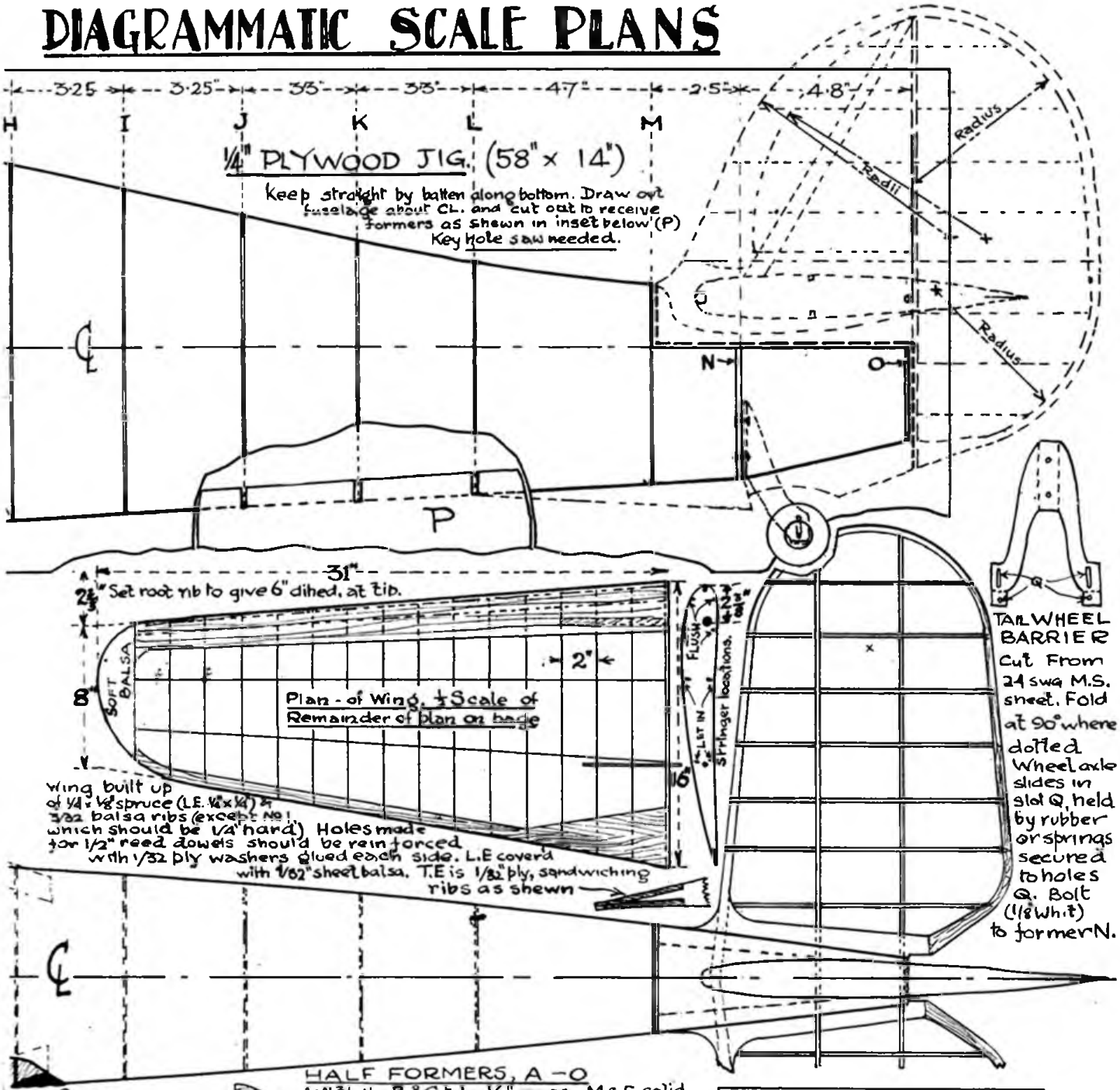
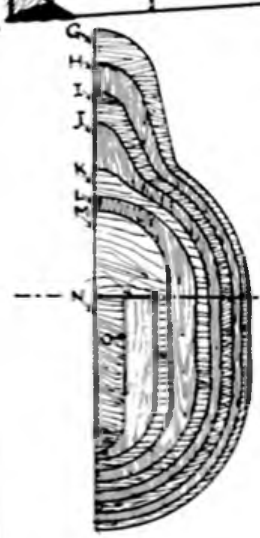
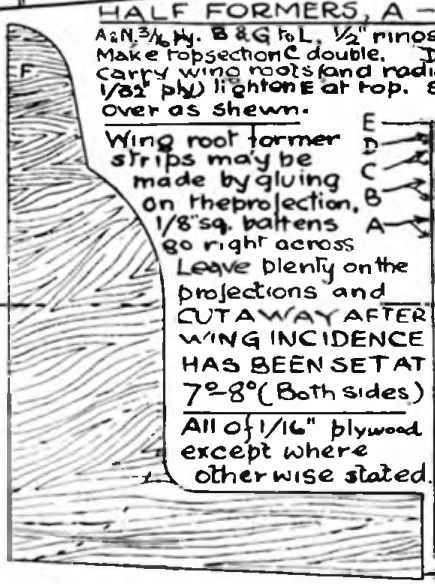
DIAGRAMMATIC SCALE PLANS

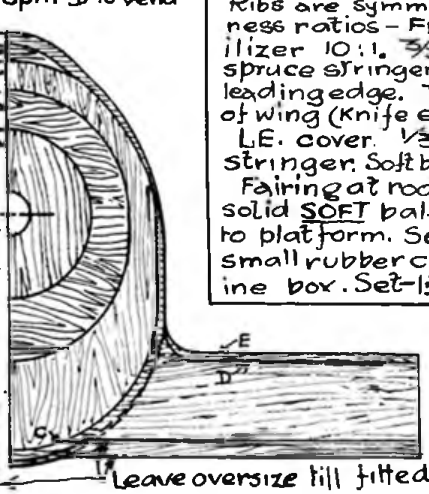


TAILWHEEL BARRIER
Cut From 24 swg M.S. sheet. Fold at 90° where dotted
Wheel axle slides in slot Q, held by rubber or springs secured to holes Q. Bolt (1/8 Whit) to former N.

HALF FORMERS, A – O







A & N 3/16 Hy. B & G to L. ½" rings. M & F, solid. Make topsection C double. D, E, F cut to carry wing roots and radiator tube of 1/32" ply) lighten E at top. Split D to bend over as shewn.

Wing root former strips may be made by gluing on the projection, 1/8" sq. battens so right across Leave plenty on the projections and CUT AWAY AFTER WING INCIDENCE HAS BEEN SET AT 7°-8° (Both sides)

All of 1/16" plywood except where otherwise stated.

FIN AND STABILISERS

Ribs are symmetrical. Fineness ratios – Fin, 8:1, Stabilizer 10:1. 3/32 Balsa, ⅛" sq spruce stringers, 3/16 rd. birch leading edge. T.Es. as for T.E. of wing (Knife edge finish).

L.E. cover. 1/32 sheet to 1st. stringer. Soft balsa ribs (optional)

Fairing at root built up from solid SOFT balsa and mated to platform. Secured by small rubber clips as engine box. Set-1½° incidence.

D. J. Miller.
15:III:39.

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SIMPLE AERODYNAMICS—XI

By J. VAN HATTUM, A.F.R.Ae.S.

THE last two articles in this series have been of a rather technical nature, and readers will, I hope, forgive me if I treat the subject this time in a lighter and more general way. All work and no play—well, we know the rest, and model flying should not be a dull boy. So let us review what we have learned so far.

We have discussed stability at great length, because it is without doubt the most important factor in successful flying. No matter how good your model theoretically, it will not bring home the cups if it is not a good flier. (I wonder if this is the way to spell it?) And it will not be a good flier if it is not stable.

Now what does this stability mean? We have been so much immersed in details that we run the risk of not seeing the trees in the wood any more and bumping into them when we may least expect it. In other words, we may pay so much attention to one particular aspect of stability that another side of the problem has been given insufficient thought. Therefore, let us look at the other fellow.

Last year in Holland we ran many competitions (or do you prefer the word contest?), and as I make a point to organise these affairs as well as possible, there was plenty of leisure to see people at work. Now, there is an important point to remember, and that is that the mistakes one makes in competitions fairly make one blush. Whenever I remember them I do blush. They seem to belong to a particular kind of mistake, and they are just what one would never think of doing if one had not that curious feeling just before an important start. Well, anyhow, these errors are worth watching. They should teach the people concerned quite a lot, if they are prepared to recognise them as errors. Some do not; they blame a fantastic current that " caught " the model, or the take-off board that is a bit warped—only nobody seems to have that same trouble—and they learn nothing as a result. If you are not ready to spot your silly mistakes you had better quit this model aviation racket. It is just nothing but making mistakes right and left and putting them right again. The little you have learned every time goes to add your store of knowledge. And after some years, when you think you know a great deal you will be pitched against an opponent who will make you doubt your own wisdom and take to learning again. We do it for fun, and we call it a sport and we enjoy it. And we would not give it up for anything in the world.

Digressing a bit am I? Well, I thought this might interest you. I want to make it plain that no series of articles, even if they ran from cover to cover for a year, will really make you a good aero-modeller. That you can become only if you " learn, mark and inwardly digest " all you meet in the course of your flying and building. Articles like these can only help, in the very strictest sense of the word. Who has ever seen a pilot who was trained only by correspondence, and flew the first time in the air? So please do not blame me when that new Wakefield is not quite longitudinally stable.

I said that stability was the most important thing in model flying. Performance only begins when stability has been achieved. We all know this, and most of us know how to get a model reasonably stable. And yet . . .

I have seen quite experienced flyers do things to their models, in the heat of battle, shall we say, that they would not themselves believe if they had been told. I have seen down-thrust removed after a very much stalled flight, and I have seen incidence increased on models that obviously were climbing all they could; air being what it is, rather vague stuff and not fitted with rungs. Yet these people do know their stuff, and I used to make the same mistake when I got worried. Now I constantly remind myself not to make them, and that helps a lot. The important point is that you must trim your model with common sense, and lead if necessary, but not with make-believe.

There is another thing that is essential to get good adjustment, and that is system. First, the whole model should be checked very carefully for general alignment and rigging. Take special notice of the angles of incidence—rigging angles, as we know them—and the centre of gravity. In the previous articles we have discussed the position of the C.G. fairly thoroughly. The design has been based on this, and we must stick to it, unless it shows up badly during the flying tests. I have advocated two positions: either at about 28 per cent of the chord or beyond 80 per cent. There are other ways, and one can make a model fly with the C.G. beyond 30 per cent and in front of 80 per cent, but every one has a personal preference for particular things. Having more or less adjusted our model on the work-bench there is every reason that the first flight may be reasonably good. It may be somewhat over-elevated or nose-heavy, but it need not be worse than that. Yet I have seen models being tested in a wild and haphazard way that does no credit to model aviation. Those folk seem to take no trouble to rig the model before flying, apparently hoping for the best, and generally meeting the worst.

A fixed schedule when testing is most important. Not only does it prevent damage, but it shows good workmanship, and one feels that one is doing the job in the right way. This is the way I test a new Wakefield :—

First, check over the whole model at home and fix the rigging angles, as called for in the drawings. Then check the C.G. position; marking the limits beyond which the C.G. must not come when the model is trimmed with lead or the wing moved along the fuselage. Next, taking advantage of a quiet day, the model is given 100—150 turns, and the first flight is made R.O.G. I always prefer this method, as the model can take up its proper attitude, and is less likely to damage itself than when hand-launched. Very likely the turns are insufficient to make the model take off, but the taxying test gives a fair indication of faults. It may be of some advantage to use a fairly short powerful motor for the first flights. In that case 100 turns may produce a good R.O.G. flight and a quick return to earth.

After the first flight there are always corrections to be made. They may be serious or not, but one thing must be remembered: change only one thing at a time. For if one applies two corrections at the same time and there is an improvement, this can be because: (*a*) both are improvements, (*b*) only one works, (*c*) one works very

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strongly while the other has an adverse effect. (*d*) There may be even a case where both are improvements, but the combined effect is too great and the model is over-corrected. The only thing we do know is that they are not both bad. This is not the way to go about it. Curiously, there are a great number of people who do adjust their models in this sketchy way. An illustration may show where the weak points of this system are to be found.

Suppose a model takes off very near the stall, sinks a little, and recovers, stalls again, and so on. It does not gain enough height to make a glide of any duration, or it is too far away to observe it. Now this stalled attitude may be caused by a number of faults, but always check the position of the C.G. It is surprising how often mistakes are made and models flown with the C.G. much further back than the fond owner believes. Next, we may suspect the rigging angles; that of the wing may be too large, while that of the tail may be too much negative. And fourth, the thrust-line may be too low, which means it should be inclined towards the C.G.

Well, here are four of the greater faults, and anyone can make his own choice. But suppose someone started by giving the tailless more incidence, reduced the incidence of the wing, and increased the down-thrust? Even if the model flew better, we would not know what had caused the improvement. Still, we would have a model that flew reasonably well. But take the case in which the model showed a very good glide. Then—remembering the rule in No. 8 of this series, November issue—we must not change anything but the down- or up-thrust. As soon as we changed, say, the incidence of the tail or the position of the C.G. that would certainly affect the glide. And the glide is the most important part of the flight. (We cannot trim for glide by hand launching the model on flat ground. The model needs a little time—that is height—to settle down to its gliding attitude).

In the above case, I should advise giving the airscrew a little down-thrust, so that the stalling tendency is removed, and the model may gain sufficient height to make a glide. There is no reason to assume that this is the improvement called for, but it is merely a kind of correction to enable us to go a step further. The glide ought to tell us now what we must do next. If the glide is very much stalled then we must turn to the first three possible faults, and the down-thrust will very likely not be needed. Checking the C.G. and the rigging angles we decided to increase the angle on the tail. Now, and only now it will be logical to reduce the down-thrust, as there will be danger of a dive into the ground. After all, it was only a temporary remedy. (Always note each change in a little notebook. One often makes a dozen flights, all with slight changes, and one is in danger of covering the same ground twice). The C.G. being in the correct position, it will be necessary to trim the model for a good glide by means of the incidence of the tail. When that has been achieved the climb and power-flight is perfected by means of adjusting the down-thrust. There is also the torque to consider, which is, however, not very great at small number of turns. One can give a little side-thrust to begin with and re-adjust when increasing the turns. I refer readers to No. 8.

In the next, and last, article in this series, I shall deal in a general way with the air-flow round the model and the shaping of the various parts.

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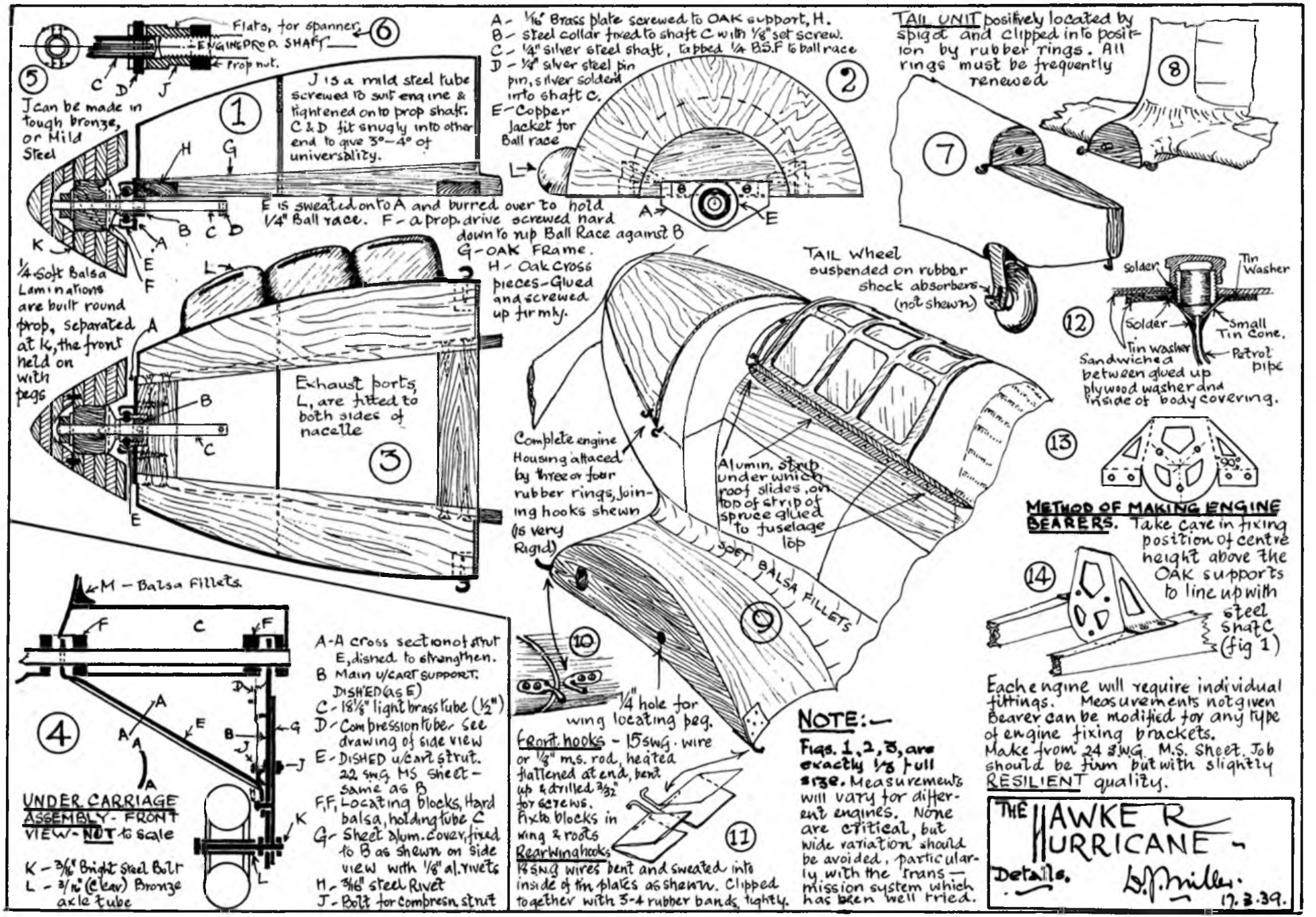

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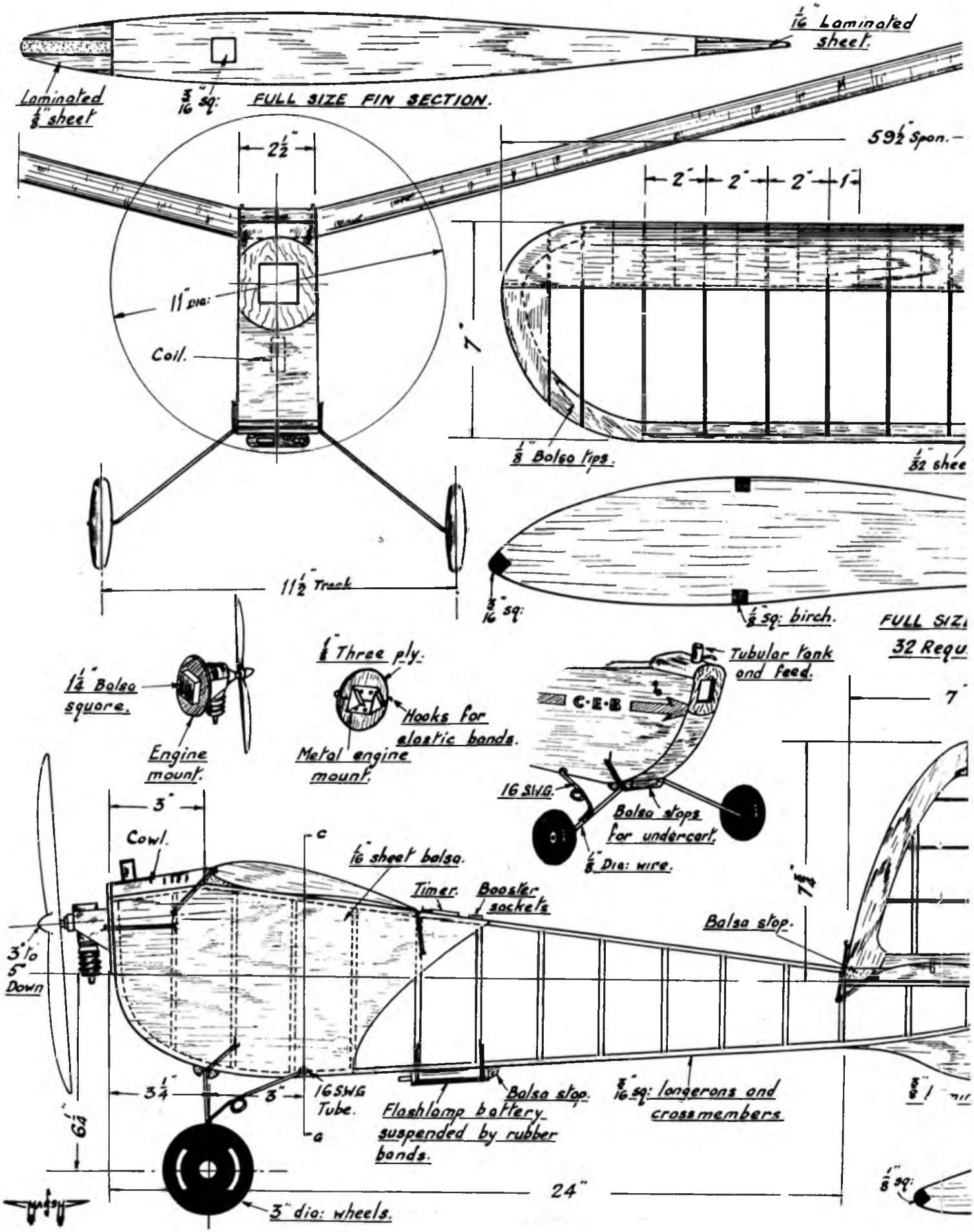

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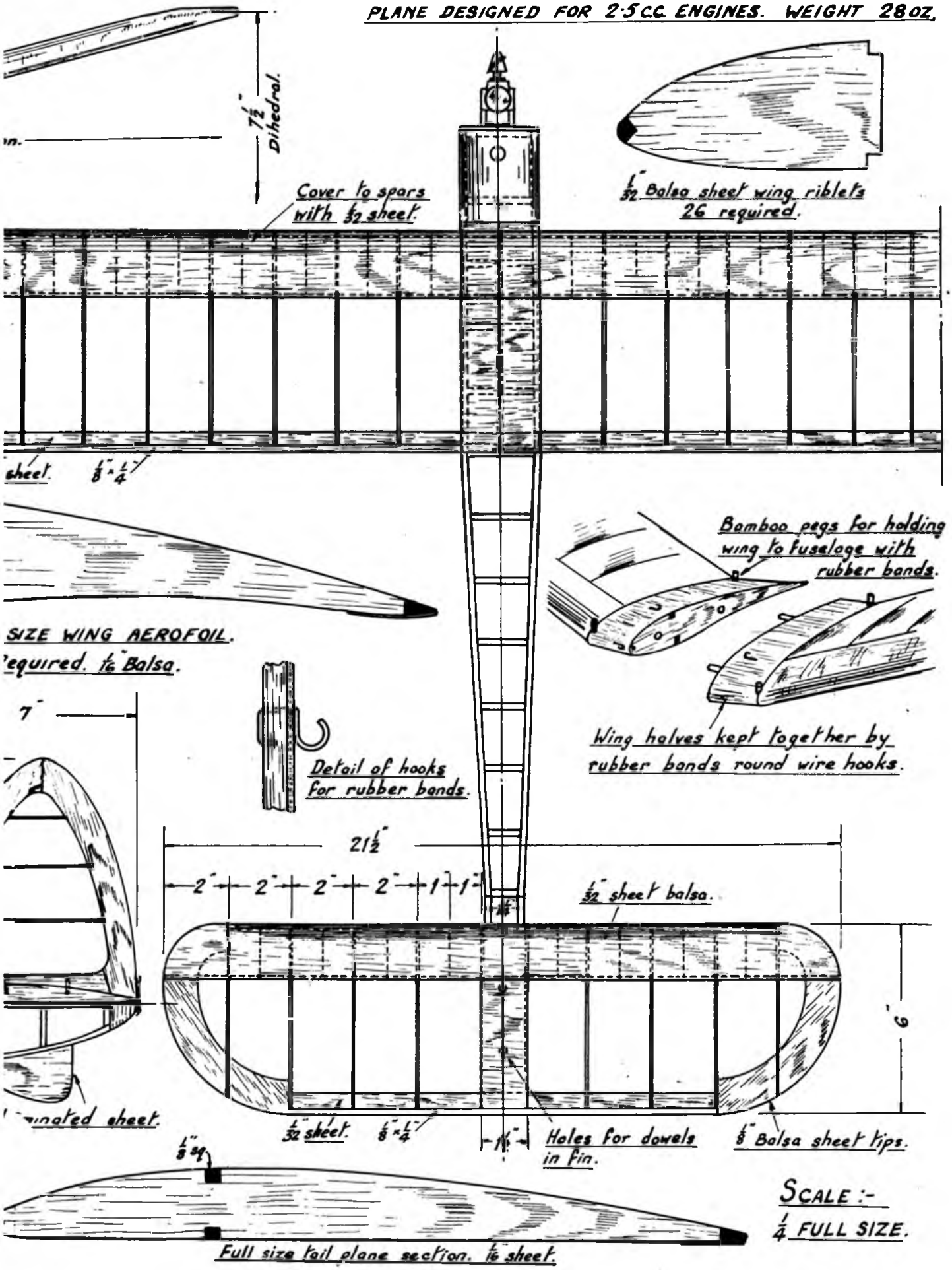
PLANE DESIGNED FOR 2·5 C.C. ENGINES. WEIGHT 28 OZ.



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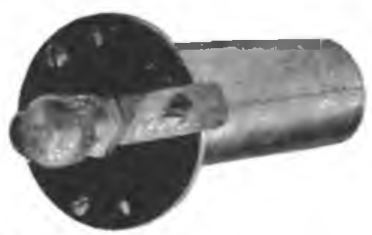

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A HIGH-CLIMBING MODEL AEROPLANE FOR 2·5 cc. ENGINES

By MAJOR C. E. BOWDEN

A NUMBER of people have had difficulty in obtaining a satisfactory aeroplane performance with the now very popular little engines of around 2·5 cc. This article may help in the design of these models. The article also gives a successful design for construction.

For some time now we have been able to buy little engines of around 2·5 cc., weighing from 3½ oz. to 4½ oz. Naturally, a great many people are interested in these smaller model engines, as they feel that a little model petrol-driven aeroplane will be so pleasant to operate, and so easy to transport.

This is very true in certain respects, but there are definite snags at present about the little fellows that I feel require more skill and experience to get results, than do the larger models with engines of 6 cc. to 9 cc., and even up to about 18 cc.

The object of this article is not to condemn the tiny petrol engine, but rather to give it a fillip by examining its limitations, and offering a few suggestions that will help to overcome these limitations, and so ensure that everyone obtains satisfactory flying.

I have given quite a lot of time to the subject of the tiny petrol model.

Right back from the early post-war petrol days, the smaller and smaller petrol model has interested me, and although I have been, and still am, very keen on the really large petrol model as well, I must admit that the small model has a great fascination.

The first step towards reducing the size of petrol model aeroplanes was taken by myself by producing the first 15 cc. model, shortly after I had obtained success with the first post-war flying petrol model of approximately 30 cc. This latter engine had the tremendous weight of 2¾ lb. bare, and even then had not a great deal of power!

From that date onwards the model engine manufacturers have steadily reduced the size of petrol engines for model aircraft.

I have obtained what I considered all the best engines of these manufacturers, and experimented with models for them with different wing arrangements.

In this way I have got a fairly clear picture in my mind of the power capabilities of each engine size, and the most useful combinations of wing loadings, wing sections, angles of incidence, and constructional methods for each size of model. The models come down in well-defined steps for each engine capacity. But in the 2·5 cc. class it is not possible to reduce constructional and ignition weight in proportion as it should be. Therefore, the little model has a poor power weight ratio. However, this can be largely overcome in other ways.

The Chief Difficulties.

There are two difficulties about the little engine of about 2·5 cc. For although the best examples now produce a lot of power and run really well, and although the engine is lighter, it is not proportionally a very great deal lighter than a really good example of the next popular size. The 6 cc. engine and its power output is naturally considerably less. Here one should remark that at the end of 1938 there have been some really tremendous advances in power output of the 2·5 cc. engine.

The next difficulty is that the ignition gear costs the same in weight, except that some people use smaller flying batteries for the 2·5 cc. engine.

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These smaller batteries are more successful on certain baby engines than on others of the same cubic capacity. This, as far as I can see, is due partly to contact-breaker design, and also to the compression ratio of the engine.

There are several really good coils of light-weight that I have used with very little trouble indeed. The American " Firecracker " 2½ oz. coil, the latest type 1¾ oz. " Comet " coil of British manufacture, and the " Elf " 2¼ oz. coil, are all reliable from my own personal experience.

Generally speaking, I have come to the conclusion, that with the flash lamp batteries that we can obtain today suitable for model flying, one gets more *consistent* flying by giving up the attractive idea of the 2 oz. type, and using the 4 oz. 4-volt flash lamp battery for flight. Of course, one must use the normal large ground accumulator plugged in for starting. I have given such a lot of time to this subject that I do not make that statement lightly. I admit there are just a few engines that really will perform well on the smaller batteries provided the batteries are absolutely up to scratch. But for all-round lack of bother, in the cold English climate, the 4 oz. battery is now my choice, and I have looked for other methods to carry the extra weight.

The 4 oz. of weight is a serious drawback, but I believe in reliability and consistent flying rather than possible touchy firing and variable power output.

I have noticed that in a hot climate the little batteries are much more successful than in a cold climate.

I have used a 3-volt, 2 oz. " Hilight " torch battery for a fair amount of flying with certain baby engines, but I really prefer the knowledge that on a cold day I shall get full power without argument, on the 4 oz. battery.

I have gone into this subject at some length because I believe that there is a lot of disappointment caused by this ignition business with the 2·5 cc. engines. You may see some people, and occasionally myself, I will admit, flying with the smaller sized batteries perfectly well in warm weather, but don't take that as the best answer for all-round work—at least not at present, until some firm produces a tiny battery with a greater output, or better still, a tiny accumulator with the accumulator's better output—one that we could recharge from a large accumulator on the field between each flight. Will not an accumulator firm listen to this cry?

There is one good tip that I can give to those who do not know it already.

Use a ground booster accumulator of good large capacity of *a slightly higher voltage than the flying battery on the model*. Plug this in before each flight for half-a-minute or so, with the time switch in contact, but the ignition points on the engine open.

Provided the voltage of the accumulator is larger than the flash lamp battery it will boost it up.

Thus a 3-volt battery requires a 4-volt accumulator, and a 4-volt battery requires a 6-volt accumulator, because the average 4-volt flash lamp battery is actually 4½ volts when well up. Never use more than 6 volts, or the coil may be damaged, and do not leave it " on charge " too long. One can then start up on the accumulator, and fly off with the flight battery absolutely at the top of its form. *And remember that model engine performance is completely ruined if the spark is not absolutely good and hearty!* Incidentally, flash lamp batteries vary in efficiency for our purposes. The 3d. Woolworth " Woolco " is excellent.

Now, assuming that you have come to the same conclusion as I have, that until we can get something better we are generally going to use the 4-volt 4 oz. battery, we must make up our minds to carry the extra 2 oz. Although we shall have a more difficult problem over the aeroplane design, we shall gain in one great respect, namely, a sure maximum engine power output, and no more of that infuriating tinkering on so many days when the power mysteriously goes, probably due to some tiny resistance somewhere. We shall have just as reliable flying as with our large models!

The Problem and How to Solve It.

We have a difficult problem before us, for we have a lot of unavoidable weight to fly, and a limited engine power to do it on.

We can make a really tabloid and flimsy model of about 3 ft. span to reduce the structural weight of the model. This is one method, and at first sight is the obvious method, and in certain cases does obtain success. But in many cases it is a partial or complete failure, because (*a*) the average semi-skilled builder cannot construct his model sufficiently lightly and yet strong enough to get consistent results in varying weather conditions. (*b*) This type of model will have to be a fast flying machine, as the size must be very small, and the wing area therefore very small for the weight we *must* carry of engine and ignition gear. Also we must have that rather feeble little 2 oz. battery, and all its variable engine power outputs.

These very little and simple models are usually very poor and fast gliders, and therefore prone to damage themselves in spite of their light weight. However, if you are building one now, do not let me put you off it, for one must admit that if the design and construction is really good, this type of model can give fast and exciting flights.

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I have one that is quite a thrill with the more powerful of the 2·5 cc. engines, but it is very fast, although stable, and the engine must be at the top of its form.

A very fast little model requires an absolutely correct prop. pitch, and every ounce of power is required.

I have also built myself some more ambitious types for these little engines, including a biplane, monocoque high wing, a low wing and baby flying boat. All have been able to fly, but only at low altitude hedge-hopping.

High Altitude, with 2·5 cc. Engines.

I think the secret of good steady climbing models for these engines is *a really light wing loading*. It must be a model of the glider type, coupled with a high aspect ratio wing with high lift section, but one that does not offer too much drag. The wing and tail must be set at exactly the correct angle of incidence to produce a happy compromise of as much lift as possible *without creating too much drag*. There is so little latitude for error or excessive drag sets in. If a reserve of engine power is to be kept for climb, the speed of the model must be low, as explained by my old friend, Mr. Van Hattum, in his excellent article on page 97 of the January issue of THE AERO-MODELLER.

Now all this sounds very simple and easy, but from observation it does not appear to have been obtained by everyone.

Produce for yourself a glider that will glide easily and flat, and not too fast, whilst carrying the weight of the engine and ignition gear, and you will then find that the engine will have little extra to do than to make the model change its flat glide into a climb and soaring flight.

It is surprising what a large area is required to obtain a light wing loading with the weight you have to carry, even when you have a good section and correct angles of incidence. The aspect ratio of the wing must be reasonably high. Nothing less than 5 ft. wing span will do for the above type of model, and even then it must be a very light model.

A Suitable Beginners' Model.

I have now given the reader the general idea upon which to work if he has not already tried the above principles. But to assist those who are beginners, and even as a basis of information for those who are not beginners, but have not yet had real success with the tiny model, I am going to rapidly describe a very simple model that we do know has actually performed well.

I have recently been home in England from Gibraltar for a few weeks, and I have flown this model a considerable amount in company with a doctor fellow enthusiast, on the edge of Exmoor, and in cold weather with no thermals about.

I have had a number of flights of altitudes up to about 1,000 feet, on limited engine run, with the model still climbing when the engine cut on its limited fuel supply. Of course, the model takes time to climb, and does not go up like a high-powered fighter, but it is a thrill to see a small engine getting a model up really high, so that it looks very small indeed, and the engine note gradually dies away.

The model was produced in a few evenings' work and is very simple, *and in every way appearance was not allowed to influence one single point of its design*. And that is a very hard thing to do!

The object was to produce a high climbing, stable and soaring type of slow flying model aeroplane, using the limited power weight ratio available, and under no circumstances get side-tracked by any other consideration. From this simple model experience can be obtained, and a great deal of fun experienced at a very little cost in time of construction and money. Later, one can evolve something better to look at, but with a similar type of performance.

If the reader decides to build this model I specially ask him not to depart from its design in any way, and to be careful to faithfully obtain the wing section and angles of incidence. After it has flown up really high several times, he will probably say how easy the whole thing is with a 2·5 cc. engine, and that he cannot think why the fellow did not produce something really decent to look at whilst he was about it! The point is, that from the experience you obtain on this model you will probably produce something really good. But I beg of you later, not now! And, above all, do not alter the shape of the curious fuselage. Fly it first.

Types of Engines to Use.

The model has been flown with an " Elf," a "Trojan," a " Hallam Baby," and the slightly heavier but more powerful British-built " Spitfire."

There are, of course, several other 2·5 cc. engines available, such as the " Brat " or " Cloud 3 "—which will power the model equally as well. I only mention the names of several that have actually flown the 'plane to show that one need not be limited to any particular type.

The new baby " Ohlsson 23 " almost overpowers the model, and gives it a too rapid speed. For this engine, and probably for the " Cloud 3," too, it would be as well to increase the span by 6 in., but keeping the chord and dihedral angle the same.

NOTE.—A leaflet giving instructions for building and flying this model can be obtained free from our Leicester offices, on receipt of a stamped and addressed envelope.

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RIGID FITTINGS FOR MODEL AIRCRAFT

By S. RUTHERFORD, A.M.I.E.

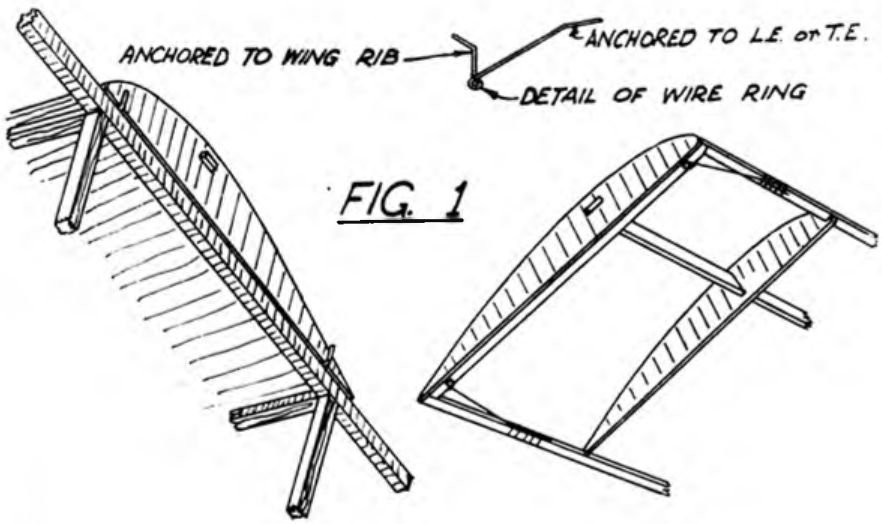


FIG. 1

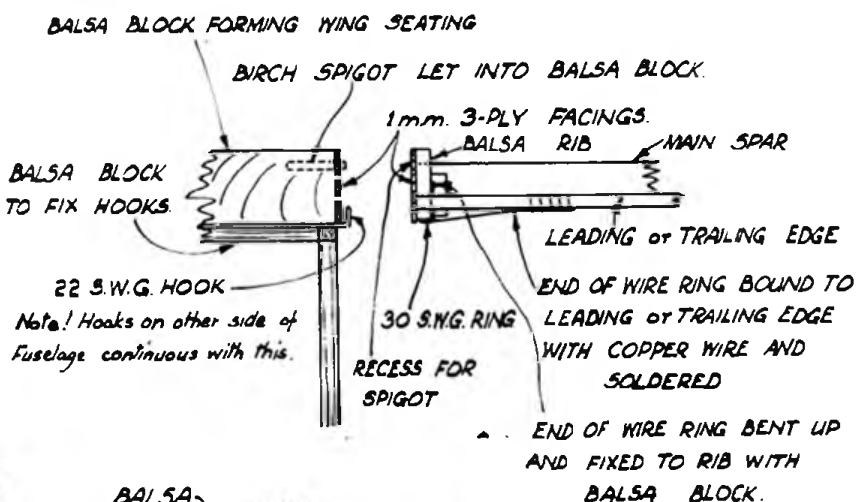
As a result of experiments carried out over a number of years, the writer has come to the conclusion that the fitting of wings and other components with flexible mountings does not always provide greater immunity from damage than positive fittings, following, to some extent, full-size practice.

Designs have, therefore, been gradually evolved for fittings of a rigid nature which tend to follow full-size practice without necessitating the use of a number of small and loose parts. The designs have been arranged in such a manner that all fittings are covered with fairings when assembled, so that no parts project to obstruct the clean streamlining of the model.

It is proposed to describe here the system of such fittings as applied to a high-wing strut-braced monoplane, the model on which the fittings have been tested being a flying scale Comper-Swift of 40 in. wing span and total weight of 7 oz.

(1) Wing Roots.

These fittings have been made as unobtrusive as possible. To the top of the fuselage are fitted fairings corresponding to the wing section, at the bottom of which are fitted two hooks of 22 s.w.g. wire, as shown in Fig. 1.



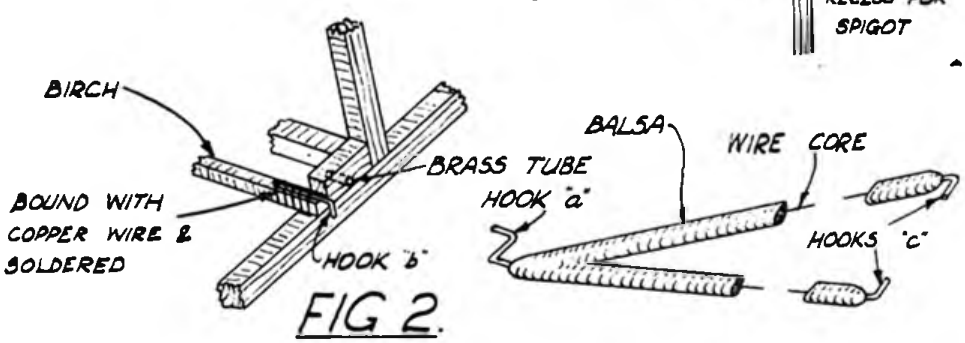


FIG 2.

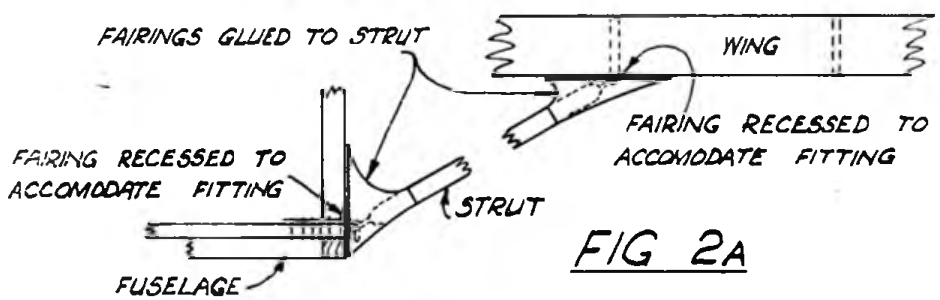


FIG 2A

At the top of the fairings, and in line with the main spars of the wings, are two rectangular spigots. The roots of the wings are provided with two rings of 30 s.w.g. wire, which engage with the hooks on the fairings, while recesses in the first rib of each wing fit over the spigots.

The method of fitting a wing is to hold the wing tip about 2 in. below its normal position, slip the rings on the wing root over the hooks on the fairing, and then lift the wing tip to its normal position, when the spigot will enter the recess and make it impossible for the wing

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root to be lifted off the hooks. The struts, when in position, prevent the wing tips from moving downwards, and therefore the whole fitting is positive in action.

(2) Struts.

The struts employed are of " V " form, so that one fitting at the bottom fixes both struts. The struts have a wire core sandwiched between two pieces of balsa wood, which is sanded down to a streamline form.

At the junction of the two struts a 22 s.w.g. wire hook (*a*), of the form shown in Fig. 2, is soldered to the wire core of the struts. To the bottom longeron of the fuselage is fixed a short length of brass tube of a size to fit over the 22 s.w.g. wire hook (*a*), and another hook (*b*) of 22 s.w.g. wire is placed slightly forward of the tube, with the free end facing downwards. The top ends of the struts are provided with plain 22 s.w.g. wire hooks (*c*), which slip into pieces of tube fitted to the underside of the wing, the struts being made sufficiently close together that the ends have to be sprung apart slightly to perform this operation.

The method of assembly is to tilt the pair of struts forward through about 90°, insert the hook (*a*) at the bottom of the struts into the tube on the fuselage as far as it will go, rotate the struts back to their normal position, when the fitting becomes locked in position by the inverted hook (*b*) on the fuselage. The top ends of the struts are then sprung into the tubular sockets on the underside of the wing, when the whole arrangement will be found to be positively secured.

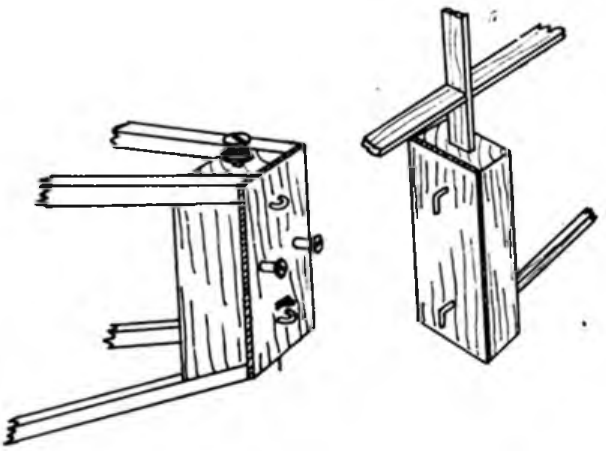
Fittings of this type can be completely covered with fairings made by glueing blocks of balsa wood to the ends of the struts and sandpapering to shape, as shown in Fig. 2a. The insides of the fairings are recessed just sufficiently to allow of assembling the fittings.

(3) Tailplane.

The fitting of this component has been made in a form which permits of adjustment for flying trim, but which is positive in action when the plane is in position. This makes it possible, when the machine has been dismantled, to reassemble it immediately as previously trimmed.

To the leading edge of the 'plane are fitted two short pieces of 22 s.w.g. wire, which engage in tubular sockets fitted to the top longerons of the fuselage—see Fig. 3. The back of the 'plane is provided on the underside with a piece of 1 mm. plywood, in which is cut a keyhole-shaped hole, which fits over a small countersunk head screw fitted to the rear of the fuselage. The screw has a cup-washer soldered to the stem just below the head, so that the plywood keyhole fits tightly between it and the head. In order to fit the 'plane, the circular part of the keyhole is dropped over the screw-head and the wires on the leading edge are fed into the tubular sockets. The wing is then pushed forward so that the screw slides down into the bottom of the keyhole.

Adjustment of the incidence of the 'plane is obtained by moving the screw up or down. The 'plane, as will



be apparent later, is prevented from slipping backwards by the rudder.

(4) Rudder.

Two 22 s.w.g. wire rings are fitted to the tail of the fuselage by means of a piece of 1 mm. plywood, as shown in Fig. 3. To the front of the rudder base are fitted two inverted hooks of 22 s.w.g. wire which engage with the rings in the tail of the fuselage, leaving the rudder free to swing sideways. Two small screws are placed in opposite sides of the fuselage tail, and are allowed to project far enough to come in contact with the rudder, preventing it from turning. By adjusting these in or out the rudder may be set at any angle.

The rudder is prevented from lifting off by a trigger of 30 s.w.g. wire, mounted in front of the 1 mm. 3-ply attached to the tail of the fuselage, and projecting through a hole cut in it to just above the bottom wire ring—see Fig. 3.

By the use of positive fittings much time and trouble is saved in the rigging of models once they have received their initial trimming, and risk of accidents, due to subsequent inaccurate trimming and the movement of parts in flight, is reduced to a minimum.

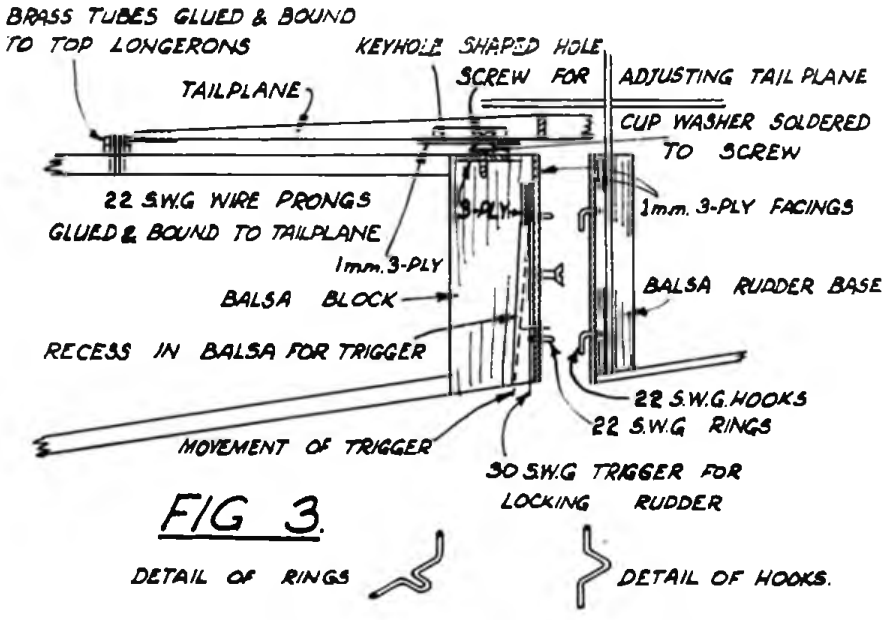


FIG 3.

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SOME MORE SOLID SCALE

THIS month we have some very interesting photographs—possibly the best collection we have yet had the pleasure of publishing. How do you like the composite, made by Mr. W. Thomas, of Swindon? Mr. Thomas tells me that this model is made from solid wood, is to a scale of 1/100th, and took 123 hours' building time. Well, I will say it was worth the trouble. It is a most attractive piece of work, and I trust that Mr. Thomas will favour us with further examples of his efforts. This modeller has won a medal for a model of Schneider Trophy 'plane; I think he deserves another for the composite!

Now, here is an original " tip " from the same gentleman. Mr. Thomas states that, as he approaches the final stages of construction, " he starts chewing." No, not the model, or stray bits of wood, but chewing chewing-gum. Wrong again, not to sooth his nerves, but to prepare his " fairing " material. In other words, he uses chewing-gum, pre-chewed, as a plastic material from which to form fillets and fairings. The gum is worked into shape and position by the aid of a tool made from steel wire. This tool is simply a straight piece of wire, beaten into small spoon shape at one end (keeping the " spoon " pointed at tip). I can well believe that very neat work can be done in this fashion, and I foresee the " gum people " paying increased dividends in the near future, when modellers all become chewing-minded. Seriously, though, the tip is worth remembering, and you might well find it an improvement over plastic wood for many purposes, as it will not harden before you can get the shape and finish you require.

Mr. R. C. Banks, of Manchester, writes me a very nice letter, but takes up most of his space in complaining that there is not enough " solid " news and tips in our journal. Well, Mr. Banks, you had better complain to the Editor about that matter. The Editor " rules the roost " you know, and I only fill the space allotted to me. Mr. Banks complains about the Flying Model Plan given with March issue, his complaint being that they could have given four " solid " plans in that space. I am afraid, Mr. Banks, that you must accept the fact that a paper must satisfy the majority of its readers, and that majority are probably " flying " fans. However, if the minority, we can at least claim to be the true artists, as we work to create a satisfying and beautiful object of craftsman's artistry, and may well claim to be the " upper-ten " of modellers. Strange that Mr. Banks should conclude by asking me to suggest a plastic material that does not dry too quickly. Try the chewing-gum, Mr. Banks, and let me know how it works out!

I have three photographs by Mr. Vaisey, but I am not sure whether I should be right in attributing the models to the same person. I rather think that Mr. Vaisey only lays claim to the photography, and that the honour for the model work goes to someone else. If I am wrong, perhaps Mr. Vaisey will correct me and, in any case, I apologise for having not filed these particular photographs in such a manner as to leave me in no doubt of their origin. These photographs show a Hawker " Hart," 15 in. span, and a 12 in. span Bulldog. The " Hart " is the only one suited to reproduction, and it looks a grand model. Just one criticism—I cannot get accustomed to the look of those targets! Pity, but they spoil an otherwise fine specimen. Remember the moral, and do not spoil many hours of work by a little carelessness when it comes to detail finish.

I welcome a really magnificent example of photography of models from Dr. ——, of Oxfordshire. I refrain from publishing this gentleman"s name, in view of his profession. This photograph is quite the best I have yet seen of its type. It has a quality of tonal values that

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NOTES ON MODELS—

By

B. CARVER

would do credit to a Hollywood cameraman, and I certainly intend that as a sincere compliment. Beautiful photography does often come from Hollywood. The photography particularly appeals to me, as I am a camera enthusiast, as well as a model enthusiast, and I know that a great number of my readers are, alike, deeply interested in both these absorbing hobbies. Apart from the artistic merits of the photography, it shows really excellent scale models. Close examination of most of the photographs I receive, show that the camera has flattered the models by disguising a certain amount of poor finish, apparent only to a keen and critical eye in the original photograph, and quite invisible in the reproduction you see on these pages. However, the closest examination of this photograph, a 7½ in. × 5½ in. enlargement, only confirms the expert craftsmanship that went into the making of the models. It is unfortunate, indeed, that the picture, as such, is marred by the stationary props.; this my correspondent recognises, and remarks that the error was only noticed by him when the photograph was printed. But for that error, the illusion is quite complete. Thank you very much, Doctor, and may we hope for some more pictures from you in the future?

Finish.—The longer I live, the more surprised I am by the poor general standard of finish of solids. What is the trouble? Are you all impatient, so much so that, having spent many hours in the actual shaping and construction, your patience breaks when it comes to painting and lining? Or, do many of you just not believe that a perfect finish *can* be obtained on wood, whether it be teak or balsa? I have had many people say to me, on viewing one of my models, " How do you get that wonderful finish? I would make many other models if only I could get a finish like that." People ask me how I get such a finish and wait expectatnly for me to divulge some closely-guarded secret. There is no secret —and, good finish is *not* wonderful. Anyone who can build a good model, can obtain perfect finish. It only calls for common sense and patience. Remember, it is what you " sand off " between coats that make the finish, *not* what you put on! Do not be afraid of giving coat after coat of primer and actual finish, and *do not* attempt " lining " work when you are tired (that is, when the hand is unsteady) or in a poor light. Put it off until you have the opportunity of doing the work in good light and untired physical condition, and you will learn that it does not require a sign-writer to do neat work. If you spoil your work by skimpy finishing, you have simply wasted your time. What does it signify that your model is exact to scale and pattern and carries hosts of minute detail fittings, if the darn thing is finished like a six-penny wheelbarrow? If you are not prepared to spend time in obtaining that perfect finish, why spend time making exact scale and pattern. If you do not care about the finish, why care about anything, why not make the whole thing just an approximate representation of the real thing, approximate pattern, approximate scale, and approximate finish. It would be just as attractive a sight as the perfectly modelled but ill-finished example. What would you think of the aircraft manufacturer who, knowing he had a very fine design, said well, the design is all right, the construction is all right, why worry about the finish—it flies! That manufacturer would soon find himself looking for a job somewhere. Yet, that is the actual attitude of many modellers. If the cap fits, you may wear it, but—pray do not take offence. I do not wish to offend, but only to drive you back to true modelling, for your own gratification.

It is gratifying to find such a high standard has been reached in the photographs which adorn these pages. It is hoped that the standard will not only be maintained, but raised. Let us raise our standard so high that it will be a real honour to have your photograph appear on these pages. This competition to obtain a " place in the sun " will stimulate a friendly rivalry which cannot fail to benefit the whole movement. The better the photographs which are forwarded to me, the greater will be their appeal and " recruiting " power. You would soon tire of my printing photographs of models made by myself. There is much more interest in seeing the work of varied modellers from all parts of the country. So, roll along, send in your photographs and, I warn you, they have to be pretty good to secure a place now, and if, as I trust, this standard steadily improves, then it will be something to brag about to have that photograph of *your* solid on these pages. So, make the competition for reproduction keen, and the pleasure you will have in winning a space for your photograph will be even keener.

So long, for the present!

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NATIONAL Model Aircraft Co., of 265 Eversholt Street, Camden Town, London, N.W.1, advertise on page 371 opposite some very attractive looking carrying cases for model aircraft. These are lined throughout, and are provided with three locks, and at the prices stated appear to be very good value for money. National are giving away *free*, with their 4d. catalogue, three sheets of wing sections: Clark Y, R.A.F. 32, and Eiffel 400. These wing sections are drawn in sizes from 3 in. to 8 in., increasing in ½ in. steps, and totalling 63 sections in all. Surely a " red-letter day " for the aero-modellist, who goes in for tapered wings, to discover this offer!

* * * * * *

On pages 330 and 331 are seven advertisements, all of trade firms, which should be of interest to many of our smaller advertisers. Supplies of rubber, accessories, wood, cements, dopes, tissues, and a large range of solid kits are offered. Products of all these firms can, of course, be obtained from all retail model shops.

* * * * * *

On page 390 Studiette Handicrafts, of Kent Street, Birmingham 5, advertise a list of smaller type flying scale kits, at attractive prices. This firm has recently introduced a twin rudder model called the Tutor Mk. 1, a kit of which we have recently examined. It is really well put up, particularly as to safe packing. The design is simple, without being unattractive. Wing ribs are stamped on $\frac{1}{32}$ in. three-ply—rather a change from the usual balsa—and the kit is also unusual in that coil springs are used in the undercarriage construction. These are of the close-coiled type, and should prove very good. Ample material is included, together with supplies of S.B.5, a new super finish, which Studiette has just introduced, and a completely finished propeller.

* * * * * *

Ashton Model Aero Supplies, of 58 Oldham Road, Ashton-under-Lyne, Lancs., advertise on page 357 a special offer for 2s. 6d. post free of a useful list of sundries, which should prove of interest to a considerable number of readers.

* * * * * *

The " Dewfly " is the name given to a 30 in. span high wing cabin monoplane, kits of which are offered by C. P. Dyne Ltd., of four different addresses in London, Mitcham, Clapham Junction, S.W.11 district, and Barking. A catalogue and guide may be obtained from this firm for 3d., and details of addresses from the advertisement on page 391.

* * * * * *

Messrs. Super Model Aircraft Supplies, of 220 Wellingborough Road, Northampton, recently sent us a kit of the " Firefly " for our examination. Of 30 in. span, and weight of $2\frac{3}{4}$ oz., the model is claimed to average over two minutes without the aid of " thermals." The kit contains a full-size blueprint, a hand-finished propeller, plenty of liquids (a particular feature being the bottle of high-gloss finish, for which excellent results are claimed), and a supply of very good quality balsa. The model is designed by Mr. E. W. Evans, who has a national reputation for high-class models with good performances, and kits are packed under his personal supervision. Particulars of the kit are on page 391.

* * * * * *

Claiming to have stocked model aeroplane accessories before any other firm in Great Britain, Clyde Model Dockyard, of 22 Argyll Arcade, Glasgow (whose advertisement is on page 357), ask us to point out to all Scottish aero-modellists that they carry an extensive stock of all classes of materials and branded kits.

Petrol engines, and American kits, are also stocked, together with a wide range of model ships.

* * * * * *

On page 348 appears the first announcement of some new type balsa propellers for duration 'planes. These props. are the result of many months' research work by Messrs. Hunt's, of Croydon, who are introducing them. Messrs. Hunt claim that the wide type of propeller blade has proved itself to have an advantage over the narrow type blade, and that their design is the result of considerable tests, which have proved this.

Another article produced by the same firm is their propeller shaft assembly, which is obtainable for the modest sum of sixpence. This comprises a 16 gauge shaft with the necessary fittings to provide an adjustable rubber tensioner and free-wheel, and also permits the propeller to be removed instantly. A special feature of the assembly is that no tools are required, neither is soldering necessary, as the fittings are positively locked on the shaft, and will easily stand the strain of twenty strands of quarter-inch elastic. The fullest directions are provided for fitting the shaft, etc., to any model.

* * * * * *

Hockenhull Aero Models, of Crewe Road, Wheelock, Sandbach, Cheshire, announce on page 357 that kits may be obtained on an instalment plan from them. Full particulars will be sent to all readers who send a stamped addressed envelope.

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KITTEN .. 6/6 post	**KANGA KUB**, 4' 6½" 57/6 plus
DRAGONFLY 9/6 free	**KANGA KITE**, 6' 9" 75/6 carriage

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KANGA REDWINGS KIT, 79/6 plus carriage

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SUPERMARINE SPITFIRE. Wingspan 30 in. Overall Length 25½ in. 9/6. Post 6d.

THE BLACKBURN SKUA. Wingspan 30 in. Overall Length 23 in. 10/6. Post 6d.

THE CURTISS P37. Wingspan 20 in. Overall Length 14½ in. 7/6. Post 6d.

Celluloid Balloon Type Wheels, Finished Flying Airscrew, and a Real Blueprint included in all Kits. Catalogue 3d.

We issue a cordial invitation to all readers of THE AERO-MODELLER *to visit our Stand at the National Camping and Open Air Exhibition, Agricultural Hall, March 24th—April 1st.*

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Special attention to Overseas Orders. **DEALERS WRITE FOR TERMS**

JIM CAHILL'S
International Champion
CLODHOPPER

Comet Kit — 47½ inches wingspan

7/-

Designed by Cahill, and plan-autographed by him, this model has been one of the most outstanding machines in the history of model aviation, winning the Moffet Trophy and the Wakefield Trophy. The model is easy to build even for a novice; special master stringers for backbone; wing plan drawn out in full; numerous sketches including folding prop. and single-bladed prop.; and ample supplies of balsa, tissue, wire, 16 in. hand-carved prop., etc.

Carriage paid **7/-**

WESTLAND LYSANDER
Wing 19", length 11". Exact scale model and fine flyer. Detailed plan. Ready turned balsa cowl. Complete kit of parts, all balsa, hand-carved flying prop., cement, dope, etc., carr. paid **3/11**

Satisfaction guaranteed or money refunded

Get it at your dealers or

SEND YOUR P.O. NOW TO
A. M. SWEETEN LTD.
CATALOGUE 28 pages - 3d. **BANK HEY ST., BLACKPOOL**

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Conveying Model Aircraft without damage has always been a problem. To overcome this we are manufacturing a superior quality fibre case. Fitted with three locks and nickel fittings, these cases are lined throughout.

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Size	36" × 6" × 6"	Price	4/6	Carriage	1/3
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FREE—To introduce our Catalogue we are giving away Three Sheets of Wing Sections for Clark "Y," R.A.F. "32" and Eiffel "400." These sections are graduated in quarter inches from 3" to 8". Send 4d. in stamps for our catalogue and obtain your gift.

NATIONAL MODEL AIRCRAFT CO. **265 EVERSHOLT STREET, CAMDEN TOWN, LONDON, N.W.1**
(Half Minute Mornington Crescent Underground Station)

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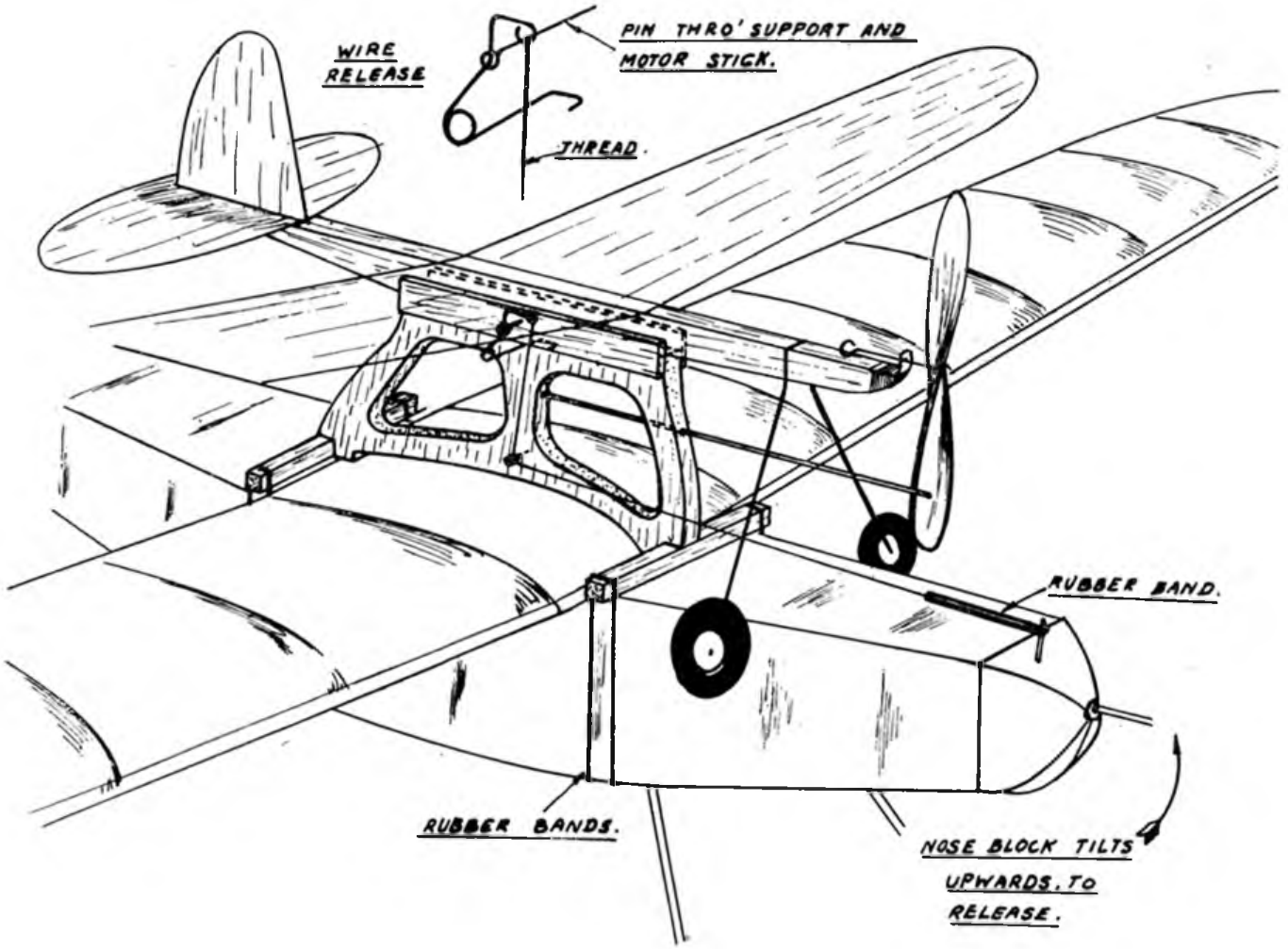
A "MAYO" RELEASE GEAR

The photo shows our contributor's models ready for a launch.

By F. WHITEHEAD

SINCE the successful launching of the " Mayo " composite aircraft, I have been experimenting with various devices for reproducing this method of launching on model aircraft. The method here described has been found to be most effective. It is simple and light; the complete cradle, release gear, and upper 'plane component weighing less than ½ ounce. The cradle, as can be seen from the diagram, is designed to fit over the centre-section of any medium-weight duration model, being secured by two rubber bands passing round the fuselage. A small length of piano wire cemented into the top of the nose block is all that is required to convert any model into the " Maia " component. I used a 30 in. span model, weight 3½ oz., for the lower 'plane, and a 10 in. span all balsa " stick " model for the upper component. The cradle was constructed of ⅛ in. sheet balsa.



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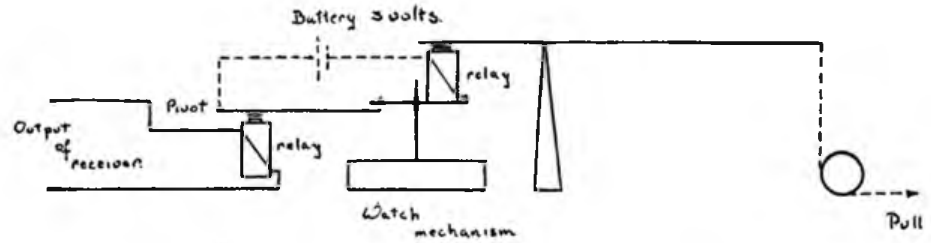
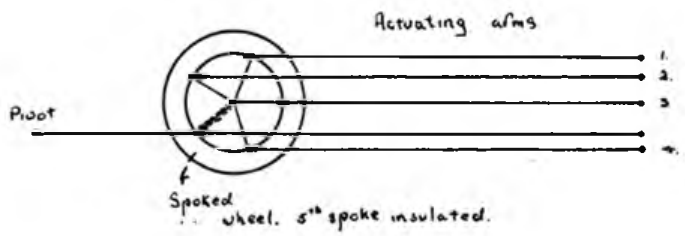
The lower 'plane is wound up first; then the upper 'plane is wound, and its motor stick place in the U-channel on the top of the cradle. The release pin is then inserted through the sides of the U and the motor stick, holding the top 'plane rigidly down on the cradle. The withdrawing spring of the bolt is compressed and held in this position by slipping the end of the thread (T) over the top of the pin (A), the rubber band (R) keeping the thread taut. The release pin is now in position (see diagram A) for launching the composite model in the usual way. The pull of the rubber motor in the lower 'plane keeps the nose-block in place, but when the power runs out at the top of the climb, the rubber band (R) pulls the top of the nose block backwards until it slips off the pin (A). The spring being now released, it opens and withdraws the release pin, allowing the upper component to fly away (diagram B).

In practice, it has been found that as the nose-block falls back into position immediately after the separation, the lower 'plane dives away and resumes a normal glide some feet below the upper 'plane. The prop. of the upper plane is prevented from rotating before release by means of a thin piano wire stop projecting from the front of the cradle.

WIRELESS CONTROL SELECTOR MECHANISM



By "TECH," Grad.I.E.E.



IT has always been a matter of extreme difficulty to construct a sufficiently light, compact, and reliable form of model radio control mechanism, and it is the object of this article to endeavour to give those who are not equipped with elaborate workshops an opportunity of constructing this simple preselector system, which can be made out of the scrap box of the average household. To the writer's knowledge, no practical system has been devised to give non-sequence operation which has not entailed elaborate, costly and delicate receiving apparatus.

The ground station of this equipment can be the usual spark transmitter. All that is necessary for the receiver is a signal of varying duration. The received signal is used to operate a coherer or valve receiver, which in turn operates a light-weight relay. It will be seen from the diagram that this relay actuates a pawl which is attached to a small watch mechanism. The watch is geared down to give a rotation of approximately 15 seconds per revolution. The main spindle of the watch carries a wheel with five spokes, so that when rotating a spoke passes the pawl every three seconds. Therefore, by signalling from the ground station anything between one and three seconds will allow the pawl to release the watch sufficiently long for it to move to the next spoke. Similarly, between three and six seconds allows the second spoke to engage with the pawl, and so on. By suitable ground signalling the mechanism can be stopped at any one of the five spokes.

The spoked wheel which is insulated from the spindle of the watch, carries a small electro magnet, which can be made from one of the pole pieces of a pair of headphones. The polarising of this is derived from a small 3-volt dry battery, which is connected via the pawl and spoked wheel. The magnet will be polarised at the moment it stops on any one of the five spokes.

From experiments carried out it has been found that the spring mechanism of a wrist watch is sufficiently powerful to rotate an electro-magnet of the type described. Also a most important factor in this selection is that the total weight need not exceed 8 ounces. It will be seen from this that considerable opportunity will be available for constructing a first-class receiver owing to the fact that much more latitude can be taken in the matter of weight.

To return to the description of the mechanism. A means has been devised whereby a magnet can be stopped at any one of five positions and energised when stationary. By taking arms off from four of these five points these can be utilised for the four main controls of the 'plane, the fifth spoke being insulated to restore the 'plane to normal flying condition. By placing the fulcrum of these arms to give a 4—1 ratio, the air gap can be kept within reasonable limits, and provide approx. $\frac{1}{4}$ in. pull, this being sufficient to provide plus or minus 15° rotation to rudder and ailerons.

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MODEL AEROPLANE

By J. R. CRESSWELL

THIS branch of model aeroplane work, which, I believe, is not known nearly as widely as it deserves to be, should appeal especially to those who make their own model aeroplanes. Perhaps I should here point out that this article does not apply solely to scale models, although they are most suitable for photography.

I propose to give here a few hints to those who intend taking up this very interesting hobby. The main idea is to produce photographs which make the models appear as real aeroplanes; this is not nearly as hard as it might sound, and I have more than once succeeded in completely deceiving people as to their reality.

There are two alternatives as to the method of photography; either they can be photographed on the ground, or apparently flying. The first is the easier of the two, but the latter you will probably find more interesting.

However, I will begin with the former method. First, a suitable surface must be found upon which to stand the aeroplane. The obvious solution is to use the lawn in the back garden, but there is one big disadvantage in doing this when photographing small models, such as one seventy-second scale—the grass is quite out of proportion compared with the aeroplane. If a rough table-cloth, a card table with a baize top, or even a rug is used, the effect will be found to be most realistic.

It is very important to have some sort of background which will look natural, as well as showing up the outline of the model. A large piece of any light-coloured material will do, but if you can sketch a hangar or a hedge, with a few trees on a piece of white paper, with a pencil or crayon, and perhaps some cloud effects, the result will be much more pleasing. Whatever you draw need not be done in detail, as the background will not be quite in focus when photographed.

Great care must be paid to correct lighting. Of course, if the photographs are taken outside, especially if the sun is shining, no supplementary lighting is necessary. It is often advisable to use reflectors in order to eliminate deep shadows which destroy detail. When taking the photographs indoors, although the daylight is sufficient (especially when using reflectors), in order not to get all the light from one direction better results can be obtained by supplementing daylight with artificial light. There are special lamps made for indoor photography, such as the "Photoflood" lamp, sold by all photographic dealers. They are reasonably cheap and well worth having. One is generally sufficient, especially when used in conjunction with daylight, but two or three give better results when used at night time. The main source of light should be from above, not directly overhead, but slightly on the side nearest the camera, and should be varied with different photographs. This main light should be supplemented with one or two others practically level with the aeroplane, directed on to the side nearest the camera, thus preventing deep shadows. If necessary, shields should be placed between the camera and the lamps to shade the lens (taking care, of course, not to obscure the picture).

The distance from the camera to the background depends on the depth of focus of the lens. This distance is generally about twice that from the aeroplane to the lens, but may best be found, if you do not possess a reflex camera, by removing the back of the camera and placing a piece of tracing-paper across the opening where the film goes, and, setting the shutter at "time," examining the image on the paper by covering your head with a dark cloth and adjusting the focus and aperature until satisfactory. The exposure varies according to the lens aperture and to the degree of lighting, and can best be found by actual experiment. Using a stop of f11 and a panchromatic fine grain film with moderate lighting, I gave exposures varying from two to four seconds, with satisfactory results; it is far better to err, if at all, on the side of over- rather than under-exposure.

A very important point is the angle at which to take your photographs. In order to produce the effect of viewing the aeroplanes from the ground, the camera should be placed with the lens practically level with the ground, so as to be pointing slightly upwards.

Those who wish to photograph their models and make them appear to be flying must do so indoors: this is very important, as the slightest draught will move the models sufficiently to blur the film when taking a time exposure. The ideal room is one which gets a lot of light, especially sunshine, and which has at least one empty wall upon which a sheet may be hung; it is also essential that it may be commandeered for considerable periods at a time!

First, a sheet, a table-cloth, or similar piece of white- or light-coloured material must be found; large enough to form a complete background for the photographs—about six feet by eight feet is usually suitable. This has to be fixed to the bare wall to form the background, or perhaps I should say "backsky." One method is to fasten one side along the picture-rail with pins, and to weight the bottom down in order to remove the larger creases. This done, two or three strings upon which the aeroplane is to

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PHOTOGRAPHY

Photos by the Author

be hung should be fixed about four inches apart across the room near the ceiling, as far from the sheet as possible, so as to put it quite out of focus, otherwise small creases will show on the film. Enough room should be left for the camera to be mounted two or three feet behind them.

Very thin cotton—No. 200 is suitable—should be used to suspend the model; two pieces should be tied to convenient places on the aeroplane according to the angle at which you want it to hang; a third piece may be suspended from the underneath and weighted so as to steady the 'plane, but this is not essential, especially when you have plenty of time in which to allow the model to become quite still.

When the model is in place it should be left for several minutes with the door and all windows closed, until it is perfectly steady before actually taking the photograph. In the meantime, the camera may be set up at about the same height as the aeroplane, and adjusted for correct focussing.

Anyone who is fortunate enough to have a "magic lantern," or similar device, can produce imitation cloud effects on the backcloth with a slide made by shading parts with Indian ink, after coating the glass with one of the mediums marketed for the purpose. Another point—the thread by which the 'plane is hung may be dyed a light grey, in order to reduce the possibility of it showing on the film; this may be done either by dipping it in ink

diluted with water or in diluted paint. The cotton should also be shaded from any direct strong light, which would show it up on the negative.

There is nothing which spoils the effect of a model apparently flying more than a "dead stick." This problem may easily be overcome, either by using the "revolistic" propeller sold by "Skybirds" especially for photography, or by obtaining a piece of fairly thick celluloid or similar clear plastic material, about one-fiftieth of an inch thick, from any model aeroplane dealer and, with a pair of dividers, very carefully scribing a series of concentric circles, about 80—100 to an inch. The celluloid should then be cut to the correct size. This, when put in place of the ordinary propeller, very successfully produces tre required effevt. A small figure in the cockpit made from an odd piece of wood further improves the realistic appearance.

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Members of the Torquay and District M.A.C. are shown in this photograph, taken at the end of March. Mr. Taylor's "Wasp," holder of the club's R.O.G. record, is that shown in the top right-hand corner.

GOOD evenin', chums. This is yer old pal Clubman come to 'ave a few words wiv year—and wot I've got to say this monf is a fair corker! Wot wiv the wevver—and I know as 'ow yer all agrees wiv me when I say it's been a regular knock-aht—tryin' to fly gliders wiv fahsands of yards of blinkin' line, and all of us wiv the wind up proper, wonderin' if this bloke 'Itler is goin' ter put 'is perishin' foot in it good and proper and put the tin 'at on our competition season. I tell yer, chums, it gets me fair 'ot under the choker wen I finks of it. Not as 'ow I minds a bit of a dust up wiv me dukes—(just ast the boys wot I did to Colin Bell)—but I've only just wiped the sweat off me blinkin' forehead wot I got through gettin' fings all ship shape for the year. And to fink that a perisher wots never built a blisterin' model in 'is life should 'ave the blinkin' nerve to get me drafted in the Army instead of flyin' me kite round New York!

Anyway, chums, lets leave 'im alone for now, and jump on the necks of some of our own slackers. Do you know, mates, it makes me fair sick when I see as 'ow my 'eart to 'eart talks goes in some Sahfend Piers and aht the ovver. Wot did I tell yer last monf—and the monf before that? Did I ast yer to let me know the monickers and addresses of the new "Derby Mugs" wot looks after yer interests? Did I ast 'em to put it on a postcard—and 'ave they done it? Like funder they 'ave! Do yer know, mates, it makes yer 'eart fair bleed it do, to see the way some of yer can't even understan' words of one syllable! Right in the middle of a report —written on bof sides of the paper, mind yer!—I finds a 'alf apologetic note to say that John Willie Winterbottom is now 'andling the affairs of the Nether Daschund Flyin' Club. 'Andlin'—I asks year, and 'e can't even do the little fing I asks 'im—for 'is own benefit, too. Anyway, mates, I guess its 'is own fault—likewise all those ovver blighters 'oo 'ave'nt event sent in at all—if they gets their eye in a sling from their clubmates. After all, am I a blessed Petulengro to know fings unless yer tells me?

There's one ovver fing, chums, before I gets dahn to puttin' yer reports frough the mangle. I gets some blokes wot leads orf the deep end 'cause I don't put all their report in—and some wot finks I'm 'avin' a go at 'em when their report don't get in at all. And do you know, mates, nine times aht of ten it's the ones 'oos always late wiv their reports wot does the most shoutin'. Nah, I puts it to yer, mates. Wot am I to do? 'Ave I got to mess all those about wot does their duty and sends the stuff in to time, or are they goin' ter suffer for the sake of a few lazy 'ounds wot can't fink of it till the last minit. Drop me a card, will yer, chûms, and let me know 'ow it strikes yer! It's not Mr. Walker as wants to know this time, but yer old china, Clubman—and I know as 'ow you'll all want ter say yer little piece. So, don't ferget, mates. Clubman's the name, an' it'll only corst yer a penny stamp. O.K.? Fanks, pals.

After which, suppose we get back to our own style again for a bit? I dare say you will all be interested to hear that the N.G.A. is going ahead tremendously, and members are rolling in fast and furious. Many clubs have written in supporting the scheme, and it seems to have met with general approval, most supporters agreeing that it fills a long-felt want. The transfers, of course, have proved very popular, and by putting these on your models it is easy to recognise fellow members.

I am extremely sorry to hear of the difficulties that Mrs. Dray has encountered since the tragic death of our old friend, Mr. H. H. Dray. Full details are contained in the S.M.A.E. report, and I would like to add my thanks to those who have undertaken to help in the matter. I call upon all my readers to support the Memorial Fund to the best of their abilities. We lost a good friend in Dray, and if we can show in any manner our appreciation of his work—well, I think the aero-modellers will not be slow in coming forward.

I am glad to see that, in spite of lack of time and practice with the new gliding rules—(and have I

Members of the Market Harborough M.A.C. at a recent club meeting. Mr. J. Packe, President of the Club, is on the extreme right.

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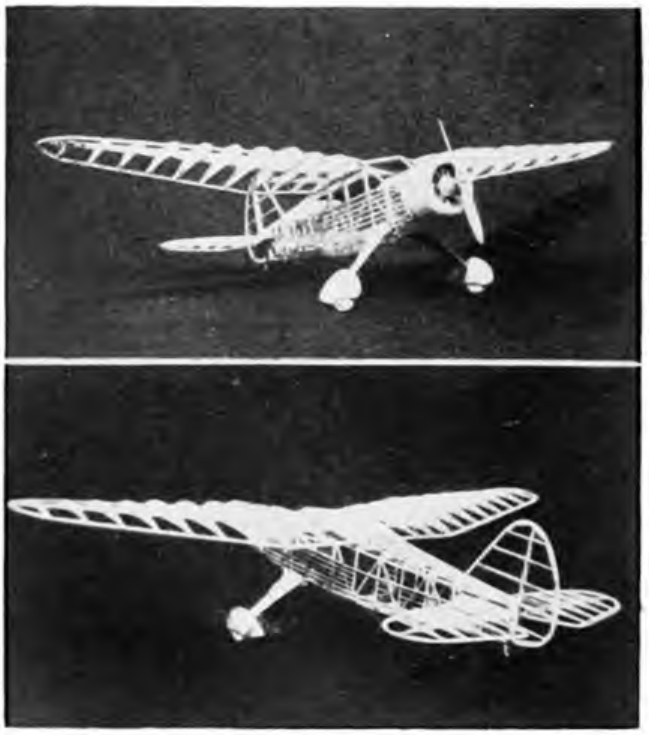
received a batch of complaints this month on this subject?) —quite good times were put up, taking into consideration the bad weather experienced all over the country. Congratulations to the Halifax boys on putting up such a good show—they have a nice lead in Plugge Cup points! And if I know anything of their duration capabilities they will take some catching now. A lot of trouble seems to have been experienced in the handling of the long line under bad weather conditions, and I know of many good flights spoiled through going O.O.S.

You will remember my remarks last month *re* the lapsing of the Leeds M.F.C. from S.M.A.E. affiliation. I have since heard from Mr. Anderton, fully explaining the position, and it is evident that there has been a lot of misunderstanding somewhere—these chaps having been waiting to hear from the S.M.A.E. with the fee all ready. I would hasten to point out that my remarks were more in the nature of sympathy than as a criticism, and it had struck me that the difficulties these chaps work under may have had something to do with it. After all, not many of us are called upon to make such a heavy payment for a suitable flying ground. May I wish you all the best, Leeds, and a speedy settling of the matter.

To save reverting to this area, suppose we start off with the report of the LEEDS M.F.C. Some remarkably good models are putting in an appearance as a result of winter building, notably Mr. Hempsall's 1½ in. scale Hillson Praga, fitted with an "Ohlsson 23" engine. The builder is now under a state of nervous "wind-up" awaiting the first tests! These chaps had very bad luck in the Pilcher contest, not one of nine gliders remaining in flying condition after tests. Mr. Anderton's job refused to leave the line, and proceeded to dig itself a nice grave in the cold, hard ground!

Mr. Needham, of the BRISTOL AND WEST M.A.C. writes: "The principal activity here recently has been indoors, for very good reasons. A well-supported pylon contest was held on March 22nd, and the winner's average R.O.G. was 60⅘ sec. Strangely enough, this same model can do (and has done!—a slight difference) —80 sec. in a much smaller hall. The second prize went to the hon. sec. of the Bath Club. Anyhow, we had the satisfaction of knowing that his model wouldn't fly at all outdoors! Third prize also went to Bath. Unsuccessful and disastrous efforts were made on the day of the Pilcher Cup, when the weather wasn't what we had intended it to be, and no glider lasted until the time fixed for the contest. One member had to be severely slapped for having the temerity to say that the S.M.A.E. might have published the rules a couple of days earlier in order to give intending entrants a chance to work out this blinking winch business. We jacked up a car, fastened a drum to a back wheel, and thus had a hot winch—in fact the winch stood up to it quite well—but not the gliders."



A fine built 40 in. span flying scale model of a monocoupe built by Mr. Earey.

The HALIFAX M.A.C. have just concluded a most successful exhibition at a local cinema, where all types of models were on show. Some thousands of people saw the show, and a number of new members resulted. The results of the Pilcher Cup contest are noted elsewhere, so there is no need to expound here on the flying put in by these chaps! Don't forget the Halifax Rally on April 30th. Place is Clifton Common, Brighouse.

Mr. M. Williams, a lone hand in the Manchester

On left, members of the Twickenham M.A.C., and on the right a group of members of the Wolverhampton Club with a good show of models.

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A fine little model of the Supermarine "Sb6," built by Mr. G. F. Pyle, of South Shields.

district, sends in a photo of a flying scale "monocoupe" that looks the goods. The 'plane has movable controls, including flaps, and the five-cylinder engine contains over 140 pieces. The photo is on the opposite page.

Mr. A. H. Smith, of 14 Falmouth Road, Ford Estate, Sunderland, is anxious to get a model club going in that area, and asks all enthusiasts around to get in touch with him. With the help of his nephew, he staged a show of models at a cinema, and I trust that by now they have been able to get a start with the scheme. We can't have the sport in too many places, and it is surprising sometimes just where one does come across the "stretchers of rubber."

A photo sent from the TWICKENHAM M.A.C. shows a group of members with models. This is yet another club who were completely washed out—or should it be "winded out"—of the Pilcher Cup.

Mr. Chilcott, of the DAGENHAM M.A.C., recently raised the club pole flying record to 80 seconds, while Mr. Barker did very well with his pole speed job.

Talking of pole flying, I have had a letter this month suggesting that this type of flying could be done with petrol models—outdoors, of course. I don't know what you think, but I can't say I'm keen on the idea!

A mock auction held by the KETTERING AND DISTRICT M.A.S. resulted in 35s. being sent to the Wakefield Fund. Mr. D. A. Russell acted as auctioneer, and also presented the club with a fine solid silver trophy, to be awarded to the member who, in the opinion of the committee, has best served the club during the current year. Quite a good idea this, and one I like to see. It is not always the best flyer, or the best competitions man, who does most for his fellow members.

The WESTWOOD M.A.C. claim to have their own breed of "Freddie" in their midst, and a very keen member he is, from all accounts. This club is now affiliated, and recently had a show of films lent by Messrs. Hawkins and Portsmouth, who are to be thanked for their support and help.

As the SKEGNESS M.A.C. is situated so far from Faireys, they are holding their own eliminating contest for Wakefield models, and the club will help to defray the winner's travelling expenses. A darn good idea this, and one I can recommend to many others. These chaps are lucky in having two very good fields within a mile of the centre of the town, the only snag being—no, not trees—dykes. These seem to have a strange attraction for the models. Club records were attacked at a recent meeting, when the over 30 in. class figure was set at 63 sec. by Mr. W. Wake, biplane at 37 sec. by Mr. C. Herring, and the junior figure was put at 58 sec. by F. Dutton.

The "Hawker Model Aeroplane Club" was formed last year by employees of Hawker Aircraft Limited. Several flying meetings were held during the season, and a few promising results were obtained, which encouraged them to become affiliated to the S.M.A.E, and to tackle the business of model making more seriously. The name of the club was changed to HAWKER MODEL FLYING CLUB, so that the initials would not clash with those of any other club.

The first meeting this season was, oddly enough, a darts and games social in the club-house, and its object was to raise a contribution towards the Wakefield Fund. Various games were organised, and 3d. a head per game was charged, the result being that they have £1 9s. 0d. towards a donation to the Wakefield Fund. I might add that the bar did a roaring trade.

On Sunday, the 19th ult., a few enthusiasts turned out with the intention of taking part in the Pilcher Cup. Although only one member possessed a glider, a few others decided to convert last year's flying models by removing the airscrews, and adding weight where necessary. However, a strong northerly wind very soon decided the fate of these models long before the contest started, and although the models were brought out in portmanteaux they could have been taken away in matchboxes.

(Courtesy, *Yorkshire Observer*).

Len Stott and another member of the Halifax Club with their last year's Wakefield models and "Winnings."

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Only one model was able to record a flight, one of 40 sec. The second attempt ended disastrously when the tow-line refused to part company with the model, and a nose dive from 200 feet made the model—well, history.

This was not a very auspicious start for the season, but there is no doubt that an aero-modellist must develop a high sense of humour, because, after spending many weeks making a model and then in a few seconds to see it reduced to a shapeless mass of wood and paper, requires an effort to laugh and mean it!

Mr. D. F. A. Baker, of Suffolk, sends an interesting photo of a "Miles Magister," that shows very good workmanship, whilst another interesting photo is sent by Mr. Pyle, of South Shields. This shows a tiny S.6.B.

Capt. Andrews, President of the LIVERPOOL M.A.S., judged a recent display of over fifty models built by the members, valuable prizes going to the best examples of design and workmanship. Capt. Andrews followed with a talk on aerial navigation, illustrating his remarks with various mechanical devices designed to aid the pilot.

The Press Sec. of the OSSETT AND DISTRICT M.F.C. has assisted this month by typing his report. Thanks! An interesting lecture was given recently by Mr. Shillito, of the Wakefield Club, while pole flying has seen 49 sec. clocked by Mr. Wilson.

Over 100 models, among them examples of aircraft from the earliest days, were shown by the SOUTHWICK M.A.C., when the following were judged worthy winners of the prizes:—

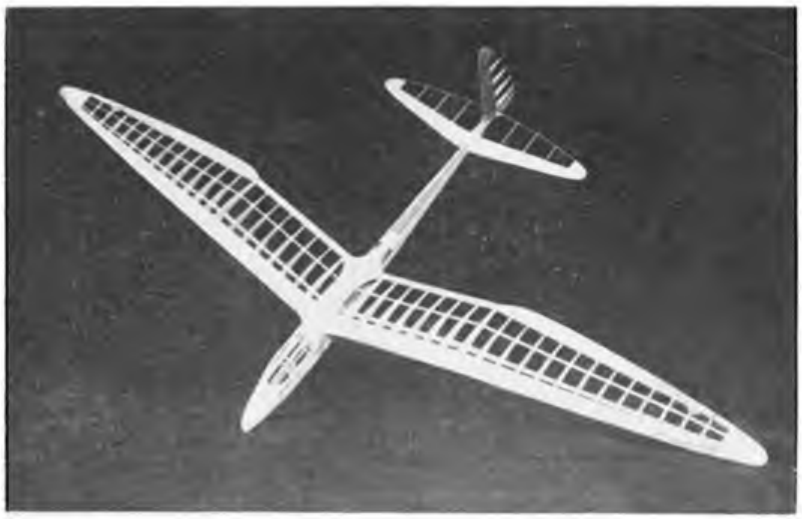
President's Cup, Mr. Scrase.
Scale model, Mr. Mussell.
Duration type, Mr. Coughtrey.
Uncovered model, Mr. Cook.
Under 14 class, Mr. Burren.

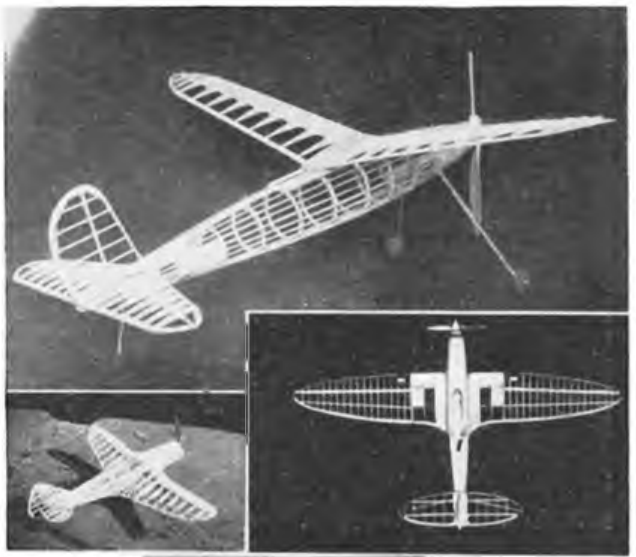
A very interesting show was enjoyed, and Capt. Grant came over from Bournemouth to judge the exhibits.

Well, well, I am taken to task because I chipped the Grimsby "highbrows." Actually, Perry, I have very catholic tastes in music—but I am willing to bet a prop. to a bottle of dope that the vast majority of aero-modellers would sooner hear a swing session than a rendering of Zwickinskipop's "Ode to Tortured Catgut." But then, of course, I may get around with the wrong crowd!

Members of the WOLVERHAMPTON M.A.C. are seen in a photo sent in, and a jolly bunch they look. (When did you take this photo? I don't remember any sun last year!) These chaps are flying on a new field at Manor Farm, Wednesfield.

This photo is of a typical high performance model sail-plane of the type built in considerable numbers in Holland.





Here is the Wakefield model referred to by "Clubman," and built by the Brothers Wilkinson. Below is a Miles "Kestrel Trainer," built by Mr. D. F. A. Baker, of Suffolk, and on the right a free lance design of a Day Bomber, built by Mr. Potter, of the Ealing Club. The span of this model is 50 in., the weight 19 oz., and the landing gear is fully retractable. Next, another monocoupe built by Mr. Williams, of Manchester, and the bottom photograph shows a solid scale model of a D.H. "Dragonfly," built by Mr. Elmes, of Ilford.

A nice shot is to hand this month of a solid scale D.H. 90 "Dragonfly," built by Mr. D. H. Elmes, of the ILFORD AND DISTRICT M.A.C., with a span of 10¾ in. The fuselage is hollowed out, and fully fitted controls, seating, etc., are contained, the whole being "flood lit" by a peanut bulb in the rear of the fuselage. Nice job, Elmes!

Changes have taken place in the WARRINGTON M.A.S., and I am assured that in spite of appearances the club has not yet embraced the Grim Reaper! Tests have been made with a few Wakefield models, but their slogan seems to

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A good photograph from the Warwickshire Club, taken by Howard Boys. Mr. Boy's elder son is holding a small model in the foreground, and he is being taken care of by Mr. N. Wilson, whose model is shown winning the "distance" round-the-pole competition. Mr. A. E. Morrod, Competition Secretary of the Club, is standing on the left. Below are shown the Brothers Pyle, of South Shields, with some of their models, and on the right a gull wing model built by Joe Walsh, of New Bedford, Mass., U.S.A.

have been that of the A.R.P., "Dig Deep." A new member, Mr. Tyrer, made the best time of the day with 75 sec., surprising everyone, including himself!

The IGRANIC S. AND S. CLUB are staging a fete at the club ground on Whit Monday, when various competitions, etc., will be held. Full-sized aircraft will also be on show, together with a pilot's aptitude indicator. It is a pity that this should clash with the King Peter Cup trials, but it is hoped that a large number will turn up and support the only club in North Bedfordshire.

The WESTON-SUPER-MARE M.A.C. seem to be on velvet with their club-room, and to read of it makes my mouth water. Flying has been *non est* in this district owing to wind and the stuff farmers pray for!

The SHEFFIELD S.A.M. now numbers 65 members, and will be exhibiting with the Engineers Society once again. Mr. Slack gave some interesting experiments with an electric drive, testing different props., etc.

The LIVERPOOL M.F.C.—the only affiliated club in Liverpool—are progressing nicely, and efforts are going ahead on behalf of the Wakefield Fund. A photo sent in shows a Wakefield model jointly constructed by Messrs. G. C. and K. H. Wilkinson, and is certainly a nice piece of work. Membership is rapidly rising, but there is still room for more, especially seniors.

Sailplanes are putting in an appearance in the ALDERSBROOK M.A.S., one being over 11 ft. in span, and at least two others being nearly as big. Most of the members seem to prefer jobs with a span of five or six feet. I am assured that in spite of the hazards afforded by the gun emplacements on this club's grounds, there is no danger of them going solidly over to solids.

With the WAKEFIELD (Yorks) M.F.C. flying has been approximately nil during the past month. The wind has been most unkind, and wings which have been made in one span have come home in much smaller boxes than the ones in which they went out! The only bright spot of the month was when a number of members accepted an invitation from the Barnsley chaps to go over to a lecture by "Rushy." A most interesting talk was illustrated by lantern slides showing the development of models from very early times to "Rushy's" own record holding indoor job. All the tips picked up, however, did not help a great deal towards packing seven members into what the manufacturers describe as "the world's most successful light car."

The DARLINGTON M.A.C. have struck a good idea by which the club is split into "flights." Full details are not given as to the complete objects, but from the matter supplied I take it that the different sections compete with each other—which in my opinion makes for keen competition, and a steady stimulus of interest.

An auction sale held by the BRADFORD M.A.C. was a big success, £4 being realised for the Wakefield Fund. That's what I like to see; as you know, this fund is one of my real pets! Appreciation is expressed of the help given by Rushy and the Lancs. boys for their help, also others who gave models and materials towards the sale.

Two meetings held—or should it be, attempted to hold!—by the NORTH COVENTRY M.A.C., were washed out by March winds, most of the flying being in

Herewith are three enthusiasts with their models. On the left J. E. Hanson, in the centre J. Bowmer with his latest petrol model, and on the right one of our first N.G.A. members — Mr. Ferndale, of Bradford.

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the nature of wonderful, though unintentional stunting. Membership is increasing very rapidly in this club.

L. Brearley, of the STREATHAM M.A.C., won a recent competition with an average performance of 80 sec., later in the day raising the club H.L. record to 119 sec. O.O.S. D. R. Taylor holds the R.O.G. figure at 75 sec.

An unaffiliated club—I would mention that no distinctions are made in reporting the activities of either type—is the HERNE BAY M.Y.C. (Aviation Section). This club was formed in 1934, the model aircraft section being added in 1935. Mr. Rippon has given this club a great deal of help, and good progress is evident.

I am glad to see that pole flying is receiving its share of attention all over the country, and some regulations are making their appearance, the usual figure being a wing span of 30 in. The READING AND DISTRICT M.A.C. tried their first bout of this interesting type of "circusing," and are that pleased they are getting down to it properly in future.

Tch tch! The weather is being blamed for something else now—the lateness in receipt of the TORQUAY AND DISTRICT M.A.C. report. Poor old Jupiter Pluvius, what you have to answer for! Flying activities have been seriously curtailed in this area, reason as usual, though the winter has seen a great deal of interest in scale work. A dance in aid of club funds was rather a disappointment, but a forthcoming exhibition may remedy this.

The ILKESTON M.A.C. had a stand at the exhibition of the Nottingham S.M.E., and arrived just in time to put the exhibits on the stand after a hectic cross-country run in a laundry van. I usually arrive with the milk van.

A very successful dinner and dance was held by the LUTON AND DISTRICT M.A.S., well over fifty guests being present. Unfortunately, Mr. and Mrs. J. C. Smith were unable to be present as hoped. Models are being tuned up for the season, and if I know anything of this bunch, they can make themselves felt too! Gliders are on the go, and a strong effort is being made to help retain the King Peter Cup in the old country. H. W. Bexley has a very hush-hush job on the stocks, whilst a new man, Mr. A. T. Groome, has turned out a very creditable piece of work in this direction.

Mr. Towner, of the BRIGHTON DISTRICT M.A.C., is building an extra special Wakefield job, details so far being that the whole machine, wings, tail and fuselage, is of monocoque construction, the whole being stressed skinned with balsa sheet. Weight, minus prop., undercart and rubber, is 3½ oz., which I venture to state is some achievement. I shall be looking for that job at the trials!

The CLACTON M.A.C. have procured a new club-room that from all accounts is one of the best equipped in the country. The treasurer is having sleepless nights, however, scraping up 25s. a month for the rent. Ah me, what a curse is money! Pole flying has "cottoned on" here (joke), whilst on April 21st and 22nd, the members are giving a variety show at the club-room at "Rok-crete," Key Road, Clacton. What about a visit, you other blokes in the neighbourhood?

Members of the ASHTON AND DISTRICT M.A.C. have started a new stunt, in which they fly for a whole month, total time flown constituting the basis of a monthly comp. In three weeks F. D. Ward has a total of over 1,000 seconds to his credit, and looks like walking away with the first round; Mr. Bardsley running second with

The top two photographs show a good display of models at the recent exhibition of the Glasgow Club, which is developing at a considerable rate. Below are two photographs from the Cardiff Club; in the upper one is shown the model taking off, to which reference is made by "Clubman" in these pages.

900. Two auction sales in aid of the Wakefield Fund have realised over £2. Go to it, lads!

I am glad to see that some clubs are getting their own houses in better order lately, it being my conviction that many go out of existence owing to a rather too free and easy method of conduct. The reason I have enlarged on this is the report that the ILFORD AND DISTRICT M.A.C. have instituted a rule that members who are more than two months in arrears with subs. are dismissed

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Here is a fine trophy presented to the Glasgow M.A.C. by the Clyde Model Dockyard — the trophy is some 15 in. high over all.

and only allowed to rejoin at the committee's discretion. And very good, too. Some good models are making their appearance, in particular three 6 ft. gliders by T. Heckles.

Yet another slice towards the Wakefield Fund has been raised by the NORTHAMTON M.A.C., Mr. D. A. Russell again being the auctioneer and collecting 26s., following delivery of a lecture on petrol engines.

More pole flying reports are from the WEST SUSSEX M.A.S., where scale models have shown great promise. I am inclined to think that this type of flying is ideal for scale work. Mr. Sanks has also been trying out a biplane on the line, likewise an (unintentional) speed job! Mr. Richardson has given the club a trophy for competition, details to be announced later. Out of seven intending competitors for the Pilcher up only two were in a condition to start after testing. Mr. Warring made a fine flight of 2 min. 5 sec. O.O.S., and finished with an average of 111 sec. Mr. Richardson came second with an average of 44 sec., his Kirby Kite finishing up in the telegraph wires!

The ELLESMERE COLLEGE M.A.C. seem to be running on German lines, their report stating that they have formed two " Cadres "—Cadre A consisting of three " staffels " of three boys each, while Cadre B has four " staffels." Though the rest of the college think they are a little " bats," they are ignoring criticism with the true spirit of pioneers!

Mr. Dove, of the BARNES AND DISTRICT M.A.S. has been " duck-ponding " with his new Wakefield job,

The " Cloud Airmaster," 7 ft. span, powered with a 9 cc. Ohlsson engine, built by Mr. A. B. Stevens, a member of the Woking and District M.A.C.

having done 2 min. 55 sec. on only 500 turns, which looks pretty good to me! These chaps have been practising with the new winch launch in readiness for the Pilcher Cup—which makes me wonder what the other clubs will have to say, considering that they did not know the rules until it was too late to practise! How come?

The DULWICH M.A.C. pole flying meeting was a big success, first place—and a gold medal—going to Mr. Ellison with a time of 98 sec., with Mr. Clements collecting a silver medal with 90 sec. Another medal will be presented to the member who makes the longest flight of the year at Peckham Rye.

Members of the SWINTON AND DISTRICT M.A.C. are asking when the secretary's monocoque model—built and finished in 1938—is going to be flown, and wondering if his latest " activity," the girl friend, will now allow him enough time to test the model. Ah me, what love can do! Thirty people attended a lecture given by Mr. C. E. Rushbrooke. (How this lad gets around!) The ovation at the end showed how much his words were appreciated.

The new press secretary of the CROYDON AND DISTRICT M.A.C. informs me that they now have a lady secretary, who has been able to place at their disposal a great deal of information gained in South Africa. Darned useful secretary I should say, and I am inclined to think that much greater use could be made of some of our ladies than just letting them hang around and get the sandwiches out at lunch time! Thanks for your co-operation, ye Croydon press sec.—and don't let it give you a " Headech! "

Mr. Titcombe, of the WOKING AND DISTRICT M.A.C., has been lecturing the members on the various attributes of a glider compared with a duration model. He contends that one should trim a rubber-powered job as a glider first—and methinks there is a lot to say for his ideas, too. Weather prevented him trying his theory at the Pilcher Cup attempts, the meeting having to be abandoned.

A good photo of pole flying is sent in by the WARWICKSHIRE M.A.C., and was taken during a " distance " competition, won by Mr. N. Wilson.

A few other photos are those showing, firstly, Mr. J. Bowmer's petrol model, Mr. Ferndale, of Bradford, with his duration model, complete with N.G.A. transfers, and a group photo, showing members of the MARKET HARBOROUGH M.A.C.

A photo from Joe Walsh, of 96 Willis Street, New Bedford, Mass., U.S.A., is of a gull wing duration job. This has quite nice lines, and certainly looks as if it could go places.

A service club, the HALTON SOCIETY, held a scale model competition, which was won by A. A. Buist, with a completely detailed model of the " Lysander." A " Flying Flea," by A. A. Andrews, was placed second, with another " Lysander," by A. A. Barton, third. These chaps have been experimenting with microfilm models in the gymnasium, with fair success.

The KINGSTON AND DISTRICT M.F.C. have been allotted the largest stand at the forthcoming exhibition to be held in Tolworth. This club reports good progress, and even though many members have had little

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or no flying experience up till last year, the standard of work, etc., is very high.

The STOCKPORT AND DISTRICT M.F.C. have a job on the " secrets list "—all Air Ministry, aren't we! These chaps gained a number of awards at a recent Concours event held with the Faireys Aviation M.A.C., the most outstanding being L. Hopley, who gained 1st, 2nd and 3rd in the non-flying scale class, also 2nd in the duration class. Some going, eh chaps!

Mr. R. V. Hodgson, of 3 The Cloisters, Grange Court Road, Harpenden, Herts., wishes to form a club in that district, so any enthusiasts around there, get to it.

Another proposed club is the Surrey Power Club, with headquarters in Croydon. This club will be recruited from other clubs around Croydon, its main object being the promotion of power model flying.

A member of the LETCHWORTH AND DISTRICT M.A.C. is building a model autogiro, but looks like being on his own in his experiments, the majority being more interested in duration jobs. It is hoped to get into co-operation with the other club in the area with a view to running combined fixtures.

Full details are to hand for the SOUTHPORT RALLY, to be held at Hesketh Park Aerodrome. on May 14th, commencing at 11 a.m.

CLASSES.

Under 150 *sq. in.*

Average of three flights to count.
Models to conform to the S.M.A.E. fuselage formula.

Over 150 *sq. in.*

Average of three flights to count.
Models to conform to the S.M.A.E. fuselage formula.

Prizes in above classes:—1st, silver medals; 2nd, bronze medals: 3rd certificates.

Biplane (One flight only).

Models to conform to the S.M.A.E. fuselage formula.
Models to have a minimum total wing area of 200 sq. in.; the smaller plane to be not less than half the area of the larger.

Flying Scale.

One flight only. Any scale.

Prizes in biplane and scale classes: 1st. bronze medal; 2nd and 3rd, certificates.

Entrance fee in all classes, 1s.

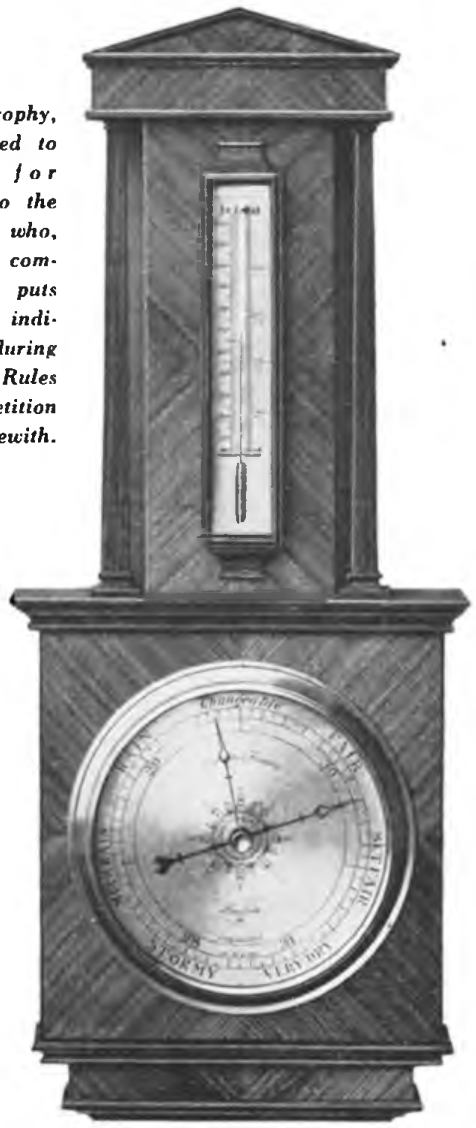
STOCKTON-ON-TEES M.A.C. members have been augmenting their finances by weekly raffles, and have got a good working bank balance in consequence!

The CARDIFF M.A.C. duration record has been raised by Vernon Hill to 106 sec. in very windy weather. The model is shown in a photo from this club just getting away nicely. The other photo shows a group of the members with models at a recent meeting.

The CHELMSFORD S.M.E. effort in the Pilcher Cup met with the usual fate, only one member getting past the first flight, only to crack up on the third. What a chapter of accidents this meeting has been!

The HIGH WYCOMBE M.A.C. has been presented with a cup for Wakefield type competition, and the secretary has been lecturing them on the subject, with especial attention to the prop., etc.

NORTHERN HEIGHTS M.F.C. members recently went the rounds, first to Dunstable, then to Luton, only



The Caton trophy, recently presented to the S.M.A.E. for annual award to the aero-modellist who, under S.M.A.E. competition rules, puts up the longest individual flight during the season. Rules for this competition are printed herewith.

THE CATON TROPHY

1. Only rubber driven models may compete.
2. The competition is open to all members of affiliated clubs.
3. Attempts may be made any time during the 1939 S.M.A.E. competition season, i.e. March 19th to September 24th.
4. All models must R.O.G. and must conform to the S.M.A.E. fuselage formula.
5. The winner will be the competitor who puts up the longest individual flight during the season.
6. Detail of flights must be sent to the S.M.A.E. Competition Secretary within three days after the flights have been made.
7. All times must be certified correct by two official S.M.A.E. timekeepers.
8. The leading names and times will be published monthly in the technical Press.
9. The contest will be under S.M.A.E. competition rules.

PRIZES.

FIRST. Winner to hold the Caton Barometer for one year and to receive Five Guineas in cash.
SECOND. Two Guineas cash.
THIRD. One Guinea cash.

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THE AERO-MODELLER'S CALENDAR

APRIL.

23.	Salisbury M.A.C.	... ...	Duration Competition.
23.	Brighton M.A.C.	... ...	Vice-Pres. Competition.
23.	Hayes M.A.S.	... ...	Power and Fixed Duration.
30.	Halifax M.A.S.	... ...	OPEN RALLY.
30.	Twickenham M.A.C.	... ...	Competition.
30.	Hayes M.A.S. ...	... ...	Duration, L.W. and H.W. and Gliding.

MAY.

7.	S.M.A.E.	... ...	M.E.I. Cup (dentralised)
7.	Lancashire M.A.S.	... ...	R.Ae.S. Cup.
7.	Bradford M.A.C.	... ...	Gliding.
7.	Ilkley M.A.C. ...	... ...	Knockout Competition.
7.	Hayes M.A.S. ...	... ...	Gliding and Frog Eliminations.
7.	Salisbury M.A.C.	... ...	Gliding.
14.	Southport M.A.C.	... ...	OPEN RALLY.
14.	Salisbury M.A.C.	... ...	Duration Cup, round 2.
14.	High Wycombe M.A.C.	...	"Childs Cup."
21.	S.M.A.E. ...	... ...	Shorts Cup (Seaplanes).
21.	Hayes M.A.S. ...	... ...	"Fairey Cup."
21.	Lancashire M.A.S.	... ...	Normac Cup.
28.	S.M.A.E. ...	... ...	WAKEFIELD TRIALS.
29.	S.M.A.E. ...	... ...	KING PEIER CUP TRIALS.
29.	Igranic S. and S.	... ...	Fete.

to return home to do their flying! A gliding competition resulted in a win for Mr. Clark, with Mr. Wilson second, and Mr. Day third.

The SHEFFIELD AIR LEAGUE SOCIETY has hit on a new idea! At the breaking up of a general meeting, all present must subscribe towards the cost of room, while anyone entering a competition must pay his entry fee at least a week before the competition takes place.

From now on, indoor meetings will only take place once a month in the EALING AND DISTRICT M.F.C These fellows have a good grouse this month. To quote: "At least four members have built models suitable for entering in the Frog Cup, but on receipt of the S.M.A.E. Handbook we find that the models are restricted to a maximum wing span of 36 in. This has caused a little indignation, as our models are of 50 in. span, and a formal note of protest will be sent to the S.M.A.E. Council." What do other clubs say? A photo is sent in of Mr. Potter's Day Bomber, of free lance design.

Canadian model built a year or two ago for the S.M.A.E. Competition—quite a rarity to see a semi-scale model of this type! But it gave quite a good performance at the time.

Wing span is 50 in., with retractable undercart, four geared motors, and a total weight of 19 oz.

Mrs. Clifford, of the CITY M.F.C. (Birmingham) had bad luck in the Pilcher contest. Two test flights had resulted in two-minute flights, but by the time the contest started wind speed had increased to such an extent it was impossible to get the models off the line.

According to the Press Sec. of the HACKNEY M.A.C., the prospect of a trip to the States has made everyone Wakefield conscious, all their members have built two models, and test flights have proved very satisfactory. One model, planked with balsa, weighs less than 5 oz. (less rubber), which is pretty good going. A travel fund has been instituted, everyone paying in as much as he likes.

The BOLTON M.A.S. has been like the "Mad March Hare" this month, as activities have been rather crowded. On Sunday, March 5th, a social evening was held at a member's house, finishing in the usual way with a hot-pot supper. Several of these evenings have been held, and have all proved successful, as well as increasing club funds.

On March 19th, the Bolton Juvenile Organisation Committee invited the club to give an exhibition of models at a "Hobbies Exhibition." This invitation was duly accepted, and a collection of about 40 models of various types were on show. The stand proved to be the biggest attraction of the exhibition, as was seen from reports in the local newspaper. Exhibitions of indoor flying were given, there being a twin-engined job which flew well, and an indoor ornithopter which put up a constant 17 seconds, and caused quite a commotion amongst the spectators. Among the exhibits were two gas models, a 6 ft. 4 in. span Kirby Kite, and several beautiful scale models, as well as a fine collection of duration models.

The chief item of news from the SALISBURY AND DISTRICT M.E.S. this month concerns the acquisition of a permanent club-room and workshop, situate at the rear of The Engineers' Arms Hotel, South Western Road, Salisbury. This was opened on March 27th, and henceforth it is probable that the workshop will be open every evening from 7 p.m. to 10 p.m., except Saturdays and Sundays. Persons interested in model engineering of any kind are cordially invited to pay a visit.

In order to popularise the building and flying of low-wing monoplanes it has been suggested that a special contest be held this year for this type of model, and to encourage the building of biplanes it is intended to provide a special prize for the Club Biplane Contest, which will be held in conjunction with the S.M.A.E. Biplane Contest later in the year.

Mr. G. D. Lovell has offered prizes for a contest for models having a wing span of between 14 in. and 15 in., on the basis that such models are easy and cheap to build and call for considerable skill in flying, especially out of doors! This contest should be an extremely interesting one.

The number of all models exhibited by the GOSPORT AND DISTRICT M.F.C. exemplified the progress of the club, and a scale model contest produced some fine jobs. The winner was Mr. H. Howe ("Hawker Demon"), second Mr. R. West ("Lysander"), and third Mr. A. Smith ("Monocoupe.")

A young reader—thirteen-year-old John Hanson, of West Wickham, sends in a photo of his first self-designed model, which is 36 in. span, and a very consistent and stable flyer, a good flight being a 60 sec. affair in drizzling rain.

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The HINCKLEY M.A.C. have struck lucky, and found that the secretary of the local Working Men's Club —where they now have their headquarters—is a war-time aviator, who has taken a keen interest in them, and procured them many helpful facilities. An exhibition proved a great success, and many new members were contacted.

WEST BROMWICH M.A.C. are going ahead well, and are yet another club to find that an exhibition can help a great deal. The treasurer has raised the club H.L. record to 103 sec., while Mr. Sower's model made a " multi point " landing in a tree, to the detriment of flying! The secretary sends in an interesting suggestion re club reports—but there are many factors against adopting the idea. Really, Swift, if you saw some of the reports I get you would agree with me that it would only act to the detriment of the club to reproduce it in full! The main difficulty is, however, the ever-increasing number of clubs—at the moment well over 280. Just work it out how much space would be required to give each just one paragraph. No, we get complaints now that club news takes up too much space—and we must remember that there are a great number of readers who are not interested in this section. Anyway, thanks for the suggestion.

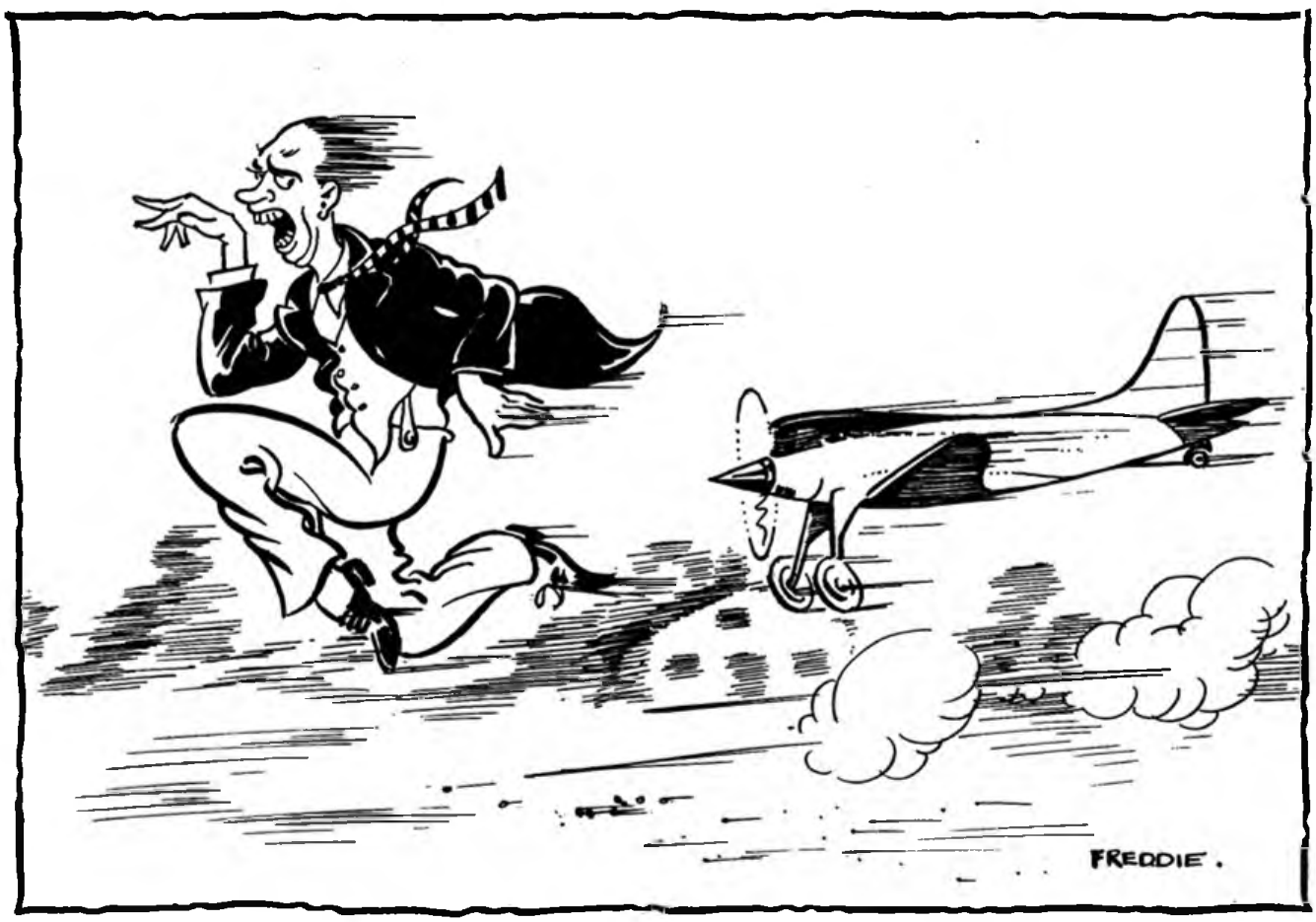
Mr. Howard Boys points out a mistake in the captions of one of the pole flying photos he sent in last month. This should have referred to the Warwickshire and not the Northants club. Mr. Boys also took the photo from this club's latest pole-flying meeting to which I have already referred.

The newly-formed BLACKBURN AND DISTRICT M.A.C. had bad luck recently when the local press photographers were in attendance at a meeting, only to find the wind writing off the models as fast as they were sent up. Hard luck, chaps!

The RUSHOLME AND DISTRICT F.C. has been reformed, and settled down to getting things shipshape for the coming season. Flights of between 60 and 90 seconds have been consistently put up in poor weather by these fellows, whilst a number of exhibitions have been staged in local cinemas.

A photo reproduced this month shows the fine trophy to be flown for at the Scottish competition scheduled for June 4th, at Bishopbriggs, commencing at 11.30 a.m. The trophy is 15 in. high, and it is stressed that this event is not an ordinary club affair, but is open to any Scottish modellist, with a standing as high as any other trophy donated to aero-modelling. These chaps point out that to compete in the Wakefield Trials at Faireys means an outlay of anything from £5 to £7—and gives the horse laugh to those Midland grousers who cribbed at having to travel only a hundred miles! These chaps suggest a flat rate of 1s. 6d. for all comps., cutting out the concession to affiliated members.

Two other photos from this club were taken at the recent highly successful exhibition. All types were on



" I WISH I HAD MADE THAT SPINNER LESS SHARP."

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show, from indoor jobs to petrol models. Mr. K. Henderson raised the pylon flying figure from 67·5 sec. to 102·8 sec.—which is some jump. Full information of the location of the ground for the Scottish Trophy competition will be posted to other club secretaries. Rules are practically the same as those published in an earlier issue, the only change being the incorporating of the " airscrew and wing-tip " launching method.

"The HAYES CLUB have a full programme ahead of them, and every Sunday, with the exception of one, there will be competitions to cater for all classes, petrol models included. For those who are interested, and we hope to get a record entry this year, the Frost Trophy for petrol models will be competed for on August 27th, the day of our gala this year.

We were very fortunate in having the company of Mr. A. C. Browne, B.Sc., Afr.Ae.S., an associate member of the club, who gave us an interesting talk on wind tunnels. Mr. Browne commenced with the earlier tunnels, explaining their construction, etc., and how the modern tunnels were evolved from past experience. We were amazed at the h.p. required to serve the needs of present-day requirements, and those (of which there are one or two) who had contemplated building a tunnel, had their ardour somewhat damped by the difficulties to overcome. Mr. Browne was so interesting that when the discussion took place, it gradually veered round to airfoils, dihedrals, drag, etc., until a halt had to be made, and a very interesting evening closed with a hearty vote of thanks to the speaker."

The LANCASHIRE M.A.S. held their Leeming Cup competition on the same date as the Pilcher Cup! Extremely windy conditions made this meeting well in keeping with first attempts of previous years, the eventual winners being A. Tindall, 105·5 sec., F. Bailey, 104 sec., and H. Hill, 97 sec. Much difficulty was experienced with the gliding event, no practise with the new launching methods having been possible.

Indoor meetings have been popular with this club, and a recent open meeting was very well attended and enjoyed. C. S. Rushbrooke has raised the club H.L. indoor figure to 5 min. 10 sec., while the recently instituted club magazine has proved a terrific success.

Mr. Suggate, of the HORNCHURCH M.A.C., won the only trophy awarded at an Arts and Crafts exhibition, taking the cake in all classes. Nice work, Suggate!

BLACKHEATH M.F.C. report: " King Peter and Wakefield Cup fever has spread among the lads of the B.M.F.C. We have been hearing reports lately of several models being built, one in particular being an 11 ft. span glider, which K. Dixon is constructing.

Our Wakefield Cup machines seem to be more streamlined and more advanced than seen in any previous years. Galbraith reports a successful retractable undercarriage. Jack Faulkner has a machine the wings of which, when viewed from the front, look like the horns of a cow. The leading edge of this model has been cut cut from a solid block of balsa.

A contest held recently for R.T.P. (distance) flying, resulted in a win for Mr. Green, who made twelve laps round a circle of eight yards diameter.

Graham Moffatt, the well-known film star, has joined the ranks of Blackheath. We've got two jokers now, " Freddie " and Graham.

We have seen the nearly completed ½ cc. engine being constructed by S. Smith. The model for this engine will have a wing span of 24 in.

The Club Shield was won by that very promising youngster, J. Jackson, with an average duration of 80·63 seconds.

The weather on Pilcher Cup day proved too rough for the many gliders seen on the field. Mr. Taylor, with a heavy converted ' Evans Gull Wing ' job averaged 42·8 seconds."

The VICTORIA M.A.C. had an extremely hectic day for their first competition, nearly all the models getting " bust " before starting the contest. E. H. Morrison won with a job just built for the day, though A. M. Cruikshank had bad luck, cracking his model up after making a test flight of over 60 sec.

That 5s. prize of the ABERDEEN M.A.C. did not last long! Mr. W. H. Souter bagged this with a flight of 89·4 sec.; he also won the first heat of the *Aberdeen Press and Journal* Cup competition that attracted 34 entries. The members are hard at work on hush-hush models, mainly to Wakefield specifications.

CARDIFF M.A.C. report an R.O.G. flight O.O.S. 2 min. 20 sec., by Mr. Chant's Fairey " Facula," which now holds the club record. With 850 turns on the motor the model gave a very good performance.

And now for some folk who have just started clubs. The HAMPTON HILL AND DISTRICT M.A.C. already has 18 members. The secretary is Mr. A. S. Glaysher, 1 New Broadway, Hampton Road, Hampton Hill, Middlesex. The NEWARK M.A.C. has 38 members after being one month in existence. Weekly meetings are being held, and more members are expected shortly. Secretary is Mr. H. T. Gelsthorpe, 36 Barnby Gate, Newark.

Mr. W. H. Metcalf, of Moyels Bungalow, Portmadock, co. Dublin, Eire, and several friends, are forming a club and ask those in the neighbourhood to get in touch with them as soon as possible.

The ROTHERHAM M.A.C. invite applications for membership addressed to Mr. A. V. Wilson, " Wendene " Park Lane, Thrybergh, nr. Rotherham.

The MANSON AND DISTRICT M.A.C. has recently reformed, and is now under enthusiastic control. Secretary: Mr. R. H. Appleton, 26 Church Street, St. Peter's, Broadstairs.

Mr. D. B. Harris is keen on forming a club at Esher. He now lives at, but will shortly remove from: " Orchard Cottage," Coombe Lane, Kingston Hill, Surrey.

The UCKFIELD AND DISTRICT CLUB is now formed. Secretary is Mr. H. Clement, " Burnett " Horney Common, nr. Uckfield, and last, but not least, the LOWESTOFT AND DISTRICT M.A.C. invites applications for membership addressed to Mr. G. B. Davies, at " Sylvan," 188 Waveny Drive, Lowestoft.

And so, me old chinas, I ses cheerio for nah! Just keep in mind wot I've told yer about keepin' yer own end up—yer knows it's the one 'oo 'elps 'imself most as gets most—as long as its not quod! I'll be wiv yer necks monf, and if yer likes to drop yer old pal a card like I asks yer, well—yer won't miss a mouldy penny, will yer! After all, we're all mates, aren't we, and yer knows wots mines me own! Anyways, that's wot I likes ter fink, but yer should 'ear the missis say 'er little piece wen I tries ter stick ter more than me share!

So long, chums, and remember—Askitoff will tike it off!

CLUBMAN'S THE NAME.

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ALL THESE FIRMS ARE SUPPLIERS OF MODEL AIRCRAFT AND ACCESSORIES

ABERDEEN Model Aero Depot, 36 Woolmanhill, Aberdeen. Kits of every make, scale and duration. Balsa strip, sheet, block. Cement, dope, banana oil, wheels, fabrics, props., engines, etc. Price list, 3d.

BATLEY.—W. Ernest Wood, Hick Lane Junction. Batley and district modellers should come to the only depot for supplies of balsa, tissue, dope, etc. Complete kits from 9d. Thermalider 3s., Skeeter 7s.

BELFAST.—Ulster Model Aircraft Supplies, 42 Wellington Place. We stock the complete ranges of Megow, Cloud, Frog and Star kits. Balsa, cement, dope, tissue, propellers, wheels, etc. Kits in preparation.

BIRMINGHAM.—L. F. Kirby, 608 Washwood Heath Road. Foremost Stockists. Lowest prices Megow. Flying models, gas type kits, dopes, banana oils, balsa, cement, plastic wood, rubber lubricant. Wholesale. Retail. Send for leaflet.

BIRMINGHAM.—South Birmingham aeromodellers please note! Get your materials and kits from Longbridge Model Aero Supplies, 1667 Bristol Road, Rednal (five minutes from Austin Works).

BRIGHTON.—Southern Junior Aircraft Co., 11-12 Queen's Place, London Road. Balsa wood, kits and accessories. Complete Megow range, from 9d. to 21s.; petrol kits 24s., 30s., 35s. W'sale & retail.

BRIGHTON.—Stafford's Bargain House, 166-8 Western Road. Model aero builders in Sussex buy their supplies from us.

CANTERBURY.—East Kent Model Engineering Co., 21b Burgate Street. We stock everything for the aeromodellist. Books, cements, balsa, wheels, props., tissues, dopes, kits of all leading makes. Best quality only.

CAMBRIDGE.—Renbro, 33-37 East Road. Largest stockists of model aircraft supplies in Cambridgeshire, including scale and duration kits, balsa wood, cement, dopes, wheels, rubber, props., tissue, bamboo, bobbins, wire, etc.

CHELMSFORD.—F. W. Foden, 27 Highfield Road. All accessories. "Owl" Junior Cabin Duration, 5s. 9d. A kit for beginners. Balsa, wood, rubber, dope, wheels, cement, flying scale kits, etc.

CHESHAM.—G. A. Final, 15 Nashleigh Hill. Largest stocks English, American, Canadian books, periodicals. Aviation, model aviation and almost every subject. Special books, magazines imported to your order. Books bought and exchanged.

CHESHAM.—Bucks. Model Aero Stores, Berkhamsted Road. Balsa any size to 6 in. width, true run bobbins, Caton's rubber, tissue, cement, Avan props. Kits. Mars from 2s. 6d. to 8s. 6d. Dick Korday 6s. 6d., etc.

CHESTER Handicraft Stores, 13 George Street. Chester and North Wales! All model aero supplies obtainable . . . give us a trial.

COVENTRY.—Model 'Drome, 89 Spon End. Let us supply your aeroplane accessories and kits. All makes in stock. We specialize in balsa wood, spruce, etc. Our materials are the best.

COULSDON.—G. E. Battey, 44 Chipstead Valley Road. Stockists of popular makes of model aeroplane kits and sundries, balsa wood, etc., etc.

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DONCASTER.—Model Crafts, 82 East Laithe Gate. We stock everything for the aeromodeller. Wholesale and retail supplied. Write for free catalogue.

DORSET.—Frank Herrings Arts and Crafts Depot, Western Road, Dorchester. Dorset aeromodellers will find good stocks of best quality materials and kits at keenest prices here.

EDINBURGH.—Abbeyhill. New Age Bookshop, Olympia Arcade, Kirkcaldy 91. Scottish model airplane builders! Balsa wood in all sizes; accessories and flying kits from all the leading makers in stock.

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EGHAM.—Box and Gillhams, 28 High Street. Model airplane and ship kits may be obtained from us. Stockists of balsa wood, cement, dope, props., rubber and all accessories.

EXETER.—Wheatcroft, 22 Mount Pleasant Road. Exeter and district modellers can obtain anything and everything—balsa, props., tissue, cement, etc. Kits in stock, new lines. Personal attention—call or write.

EDGWARE.—Home Efforts, 89 High Street. You build model aeroplane kits? Then pay us a visit and see our stock of balsa, props., wheels, kits, rubber, dope, etc.

FOLKESTONE.—Model Engineer, 98 Tontine Street. We specialise in high-class models. Kits or ready-made. All types, good selection, good display, good service every day.

GILLINGHAM.—Medway Tyre and Handicrafts Co., 60 High Street. Model aircraft supplies. Comet, Peerless, Megow kits. Balsa in block, strip or sheet. Special—balsa $\frac{1}{8} \times \frac{1}{8} \times 36$ in., 6d. per doz.

GLOUCESTER.—Fletcher's Sports Ltd., King's Square, Gloucester. Aeromodellists in this district, buy your materials from us! Send for price-lists. Full catalogue in course of preparation.

GOODERSTONE, Norfolk.—Newson and Co., The Stores. We stock "Joy Plane" products, kits and accessories. We specialise in building up kits ready to fly for customers. Inquiries invited.

GRIMSBY.—Yearing, 26 Pasture Street. The shop for quality-minded aeromodellists. First-class accessories and kits. Specially selected balsa wood. We carry the largest stock in the district.

GUILDFORD.—Pascall, Woodbridge Road. For all model aero supplies—large stocks—best materials only. Megow and Burd kits, balsa wood, cement and dopes, rubber, tissue, propellers, wheels, bamboo, etc.

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HAMPTON HILL, Middlesex.—Surrey Signs, 1 New Broadway, Hampton Road. Stockists of model aeroplane kits and materials, balsa wood, etc. Free delivery within seven-mile radius. Send for price list.

HARROW.—A. H. Matthews, 15 Peterborough Road. For model aircraft supplies, balsa wood, cements, dopes, Jap tissue, piano wire, celluloid wheels, plywoods and hardwoods of all descriptions.

HEATON MERSEY.—Hammond Model Aircraft Supplies, 401 Didsbury Road, Stockport. Balsa wood cutters to the trade. Kits and accessories, plywood slats for balsa packing, etc. Send for quotation.

HERTFORD.—Woodcrafts, The Wash. We stock selected balsa wood in all sizes, aero plywood, ho-wood and all sundries. All leading British and American kits, rubber and gas, stocked.

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"JOY-PLANE" PRODUCTS PRODUCE PERFECT 'PLANES. SEE ADVERT., PAGE 331.

KETTERING.—Ern. Berwick, 69 Montagu Street. Flying scale construction kits, 15 in. 9d., 20 in. from 1s. 3d., 30 in. from 2s. 3d. Also Burd, Megows, etc. Balsa wood, props., dope and all accessories.

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LONDON DISTRICT.

BARKING ROAD, LONDON, E.13.—Norman Jaggers, 617 Barking Road and 346 High Street, E.12. For balsa wood and all model aero parts. Flying model kits stocked. Write or call for our list.

BATTERSEA.—F. Gunnell, Woodworker's Stores, 320 Battersea Park Road, London, S.W.11. Battersea, Burd, Megow and Studiette kits. Dick Korda's record holder. The "Skeeter," etc., in stock.

BATTERSEA.—E. J. Bannister, Model Aero Supplies, 46 Battersea Bridge Road, London, S.W.11. Aeromodellists since 1912! Kits and everything the modeller requires. We give assistance and advice free. Catalogue and guide, 3d.

CHELSEA, LONDON, S.W.3.—Lafferty's, 308 King's Road. For all model aero requirements. Best quality balsa wood only stocked. Joy plane dopes, etc. Bournemouth grey rubber, airscrews, tissue, etc.

CHINGFORD, E.4.—Super flying job "Astra," 5s. 6d. complete. High wing, 26½-in. span, ribs cut. "Wilfly," 36-in. wing span, 10s. 6d. complete. Megow's 9d.-35s. stocked. Postage 6d. G.S., 155 Station Road.

CHISWICK.—A. A. Baker, 526 High Road, London, W.4. Large variety of kits. Selected balsa, m. and m. wheels, all accessories for aeroplanes and boat models, blueprints, etc. Postal orders receive prompt attention. Phone 3816.

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COVENTRY.—Laurance's Model Shop, Ford Street and White Street, Coventry. Try our "Vernon" series glider kit. "Buzzard" 6 ft. span price 9s. 6d. Stockists of Megow, Amco, Burd kits. Phone 3787.

EDGWARE.—Watson's Wood Stores for model aero supplies, balsa wood and flying kits, all prices. Large stock of sundries and plywood. 195 Burnt Oak, Broadway, Edgware.

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NORTHAMPTON.—The Midland Supply Co. for model aero supplies. Megow kits and all accessories. Lists post free (trade supplied), 144 Abington Avenue. Phone 1579.

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RUSHOLME.—Model 'Plane Supplies, 9 Walmer Street, Rusholme, M/C14. Modellers—we stock kits of Burd, Normac, Cleveland and Comet models. Brice 9d. to 15s. 6d., carriage paid. Endurance models of Thermalider, Condor Clipper, Club Blue Bird, White Wings and Curlew. Built-up models of these include carrying case. Prices on application.

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AMERICAN ⅛ h.p. PETROL ENGINE, complete with coil, condenser; perfect condition, £2.—DENNIS, 116 Ravensdale Road, Mansfield, Notts.

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PRO FORMA

No Policy or other Contract dated on or after 1st Jan., 1924, will be recognised by the Committee of Lloyd's as entitling the holder to the benefit of the Funds and/or Guarantees lodged by the Underwriters of the Policy or Contract as security for their liabilities unless it bears at foot the Seal of Lloyd's Policy Signing Office.

LLOYD'S POLICY

(Subscribed only by Underwriting Members of Lloyd's who have complied in all respects with the requirements of the Assurance Companies Act of 1909 as to security and otherwise.)

Whereas NATIONAL GUILD OF AERO-MODELLISTS, per DUDLEY SHIP, ESQ., hon. secretary, of 44 Holdenhurst Road, Bournemouth, for and on behalf of its members (hereinafter called "the Assured"), have paid £..... Minimum and Initial Premium or Consideration to Us, who have hereunto subscribed our Names to Insure against Loss as follows:—

This Policy is to indemnify members of the Assured Guild (hereinafter called the "Insured Members") against all sums which they shall become legally liable to pay in respect of claims made against them for compensation for:

ACCIDENTAL BODILY INJURY TO PERSONS and/or DAMAGE TO PROPERTY resulting from any accident or accidents occurring during the period of this Policy caused through the negligence or default of Insured Members and/or persons acting on their behalf and to whom they may be responsible whilst engaged in flying model aircraft anywhere in the United Kingdom, but subject to the exclusions and conditions hereinafter stated.

EXCLUDING:

1. Injury to any person who at the time of sustaining such injury is engaged in the service of and/or acting on behalf of the Insured Member(s).
2. Damage to property actually the Insured Member(s) own or in the Insured Member(s) custody or control.
3. Injury or damage directly or indirectly caused by accidents occurring outside the limits of the United Kingdom.
4. Loss or damage or any liability directly or indirectly occasioned by, happening through or in consequence of war, invasion, act of foreign enemy, hostilities (whether war be declared or not), civil war, rebellion, revolution, insurrection or military or usurped power.

PROVIDED THAT:

1. In addition to Compensation as above, the Underwriters agree that, in the event of their requiring any claim to be contested by the Insured Member(s), they will pay all costs, charges and expenses in connection therewith subject nevertheless to the following conditions:
   (*a*) If the claim is successfully resisted by the Insured Member(s), they will pay all costs, charges and expenses incurred by the Insured Member(s) in connection therewith up to but not exceeding the sum insured under this Policy.
   (*b*) If a payment exceeding the sum insured has to be made to dispose of a claim, the liability of Underwriters to pay any costs, charges and expenses in connection therewith shall be limited to such proportion of the said costs, charges and expenses as the sum insured by this Policy bears to the amount paid to dispose of the claim.
2. The liability of Underwriters shall not exceed the sum of £5,000 (five thousand pounds) in respect of any one accident or series of accidents arising out of any one event, and is unlimited in respect of any and all accidents occurring during the currency of this Policy, except that the Underwriters shall in addition pay all legal and other costs incurred with their consent in the defence of any claim made against the Insured Member(s), but subject to provision No. 1 above.

SCHEDULE

Basis on which the premium paid by the Assured is to be adjusted:

On the total membership of the assured Guild during the currency hereof, it being understood that the said Guild comprises two classes, i.e.,

(1) Members who fly rubber-driven model aircraft.
(2) Members who fly petrol-engined model aircraft.

during the period of 12 months commencing with the first day of February, 1939, and ending with the last of January, 1940, both days inclusive, and for such further period or periods as may be mutually agreed upon.

If the Assured shall make any claim knowing the same to be false or fraudulent, as regards amount or otherwise, this Policy shall become void, and all claims thereunder shall be forfeited.

Now know We, that We the Underwriters do hereby bind Ourselves, each for his own part, and not one for Another, our Heirs, Executors, and Administrators, to pay or make good to the Assured or to the Assured's Executors, Administrators, and Assigns, all such Loss or Damage as aforesaid as may happen to the subject matter of this Insurance, or any part thereof during the continuance of this Policy; such payment to be made within Seven Days after such Loss is proved and that in proportion to the several Sums by each of Us subscribed against our respective Names not exceeding the several Sums aforesaid.

In Witness whereof We, Underwriting Members of Lloyd's, have subscribed our Names and Sums of Money by Us insured.

Dated in London, the 193

CONDITIONS

(1) This Policy is subscribed subject to the Conditions contained herein or endorsed hereon, all of which are to be deemed Conditions precedent to the liability of the Underwriters.

(2) If after the Insurance has been effected the risk be materially increased without the assent of the Underwriters the Insurance shall be void.

(3) Upon the happening of any occurrence likely to give rise to a claim under this Policy and/or upon the receipt by the Insured Member(s) of notice of any claim or of any other subsequent proceedings, notice in writing, with full particulars, shall be given to the Underwriters as soon as possible after same shall come to the knowledge of the Insured Member(s) or the Insured Member's representative.

Every letter, claim, writ, summons or process shall be forwarded to Underwriters immediately on receipt by the Insured Member(s).

N.B.—It is agreed that "Notice" as specified above, may be given by the Insured Member(s) through his (their) Agent, Dudley Ship, Esq., 44 Holdenhurst Road, Bournemouth.

(4) No liability shall be admitted and no admission, arrangement, offer, promise or payment shall be made by the Insured Member(s) without the written consent of Underwriters, who shall be entitled, if they so desire, to take over and conduct in the name of the Insured Member(s) the defence of any claim or to prosecute in his (their) name for their own benefit any claim for indemnity or damages or otherwise against any third party, and shall have full discretion in the conduct of any negotiations or proceedings or the settlement of any claim, and the Insured Member(s) shall whenever possible, give all such information and assistance as Underwriters may require.

(5) If any claim under this Policy is also covered in whole or in part by any other Insurance, the liability of Underwriters shall be limited to their rateable proportion of such claim.

(6) The Underwriters may, by a Registered Letter sent (by or on the instructions of the Underwriters) to the Assured's last known address, give 10 days' notice of their intention to cancel this Policy, such notice to take effect from midnight of the day following that upon which the letter is posted, and no liability shall attach hereto in respect of any accident occurring after the expiration of such notice. On the expiration of such notice of cancellation the Underwriters shall on demand return to the Assured a proportion of the premium corresponding to the unexpired period of this Policy.

(7) The Insured Member(s) shall and will at all times exercise reasonable care in seeing that appliances used are substantial and sound, and in proper order, and fit for the purposes for which they are used, and that all reasonable safeguards and precautions against accident are provided and used.

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MEMBERSHIP FORM for NATIONAL GUILD of AEROMODELLISTS

For Office Use
M. No.....
Date Joined.....
Petrol M.....
Rubber M.....
Reg. No.....

FORM No. 1

Christian Name (*Block Letters*)_____ ***Surname***_____

Address_____

_____

Whether :- RUBBER MODELLIST / PETROL MODELLIST (cross out whichever is inapplicable.)

Herewith attached 6d. P.O. No.....for enrolment as a Rubber Modellist

Herewith enclosed 2/6 P.O. No..... for enrolment as a Petrol Modellist.

Herewith enclosed.....pence for further transfers at rate of 4 a penny
(four transfers are supplied free)

Name and Address of Newsagent_____

_____

FORM No. 2

Christian Name (*Block Letters*)_____ ***Surname***_____

Address_____

_____

Club (if any)_____

Make of Petrol Engine(s)_____

NOTE ***The above two forms should both be completed and returned to:—Mr. Dudley Ship, Hon. Secretary, 44, Holdenhurst Road, Bournemouth.***

FORM No. 3

TO BE HANDED TO YOUR NEWSAGENT

Name of Newsagent_____

Address_____

Commencing with the June, 1939, issue, please deliver or reserve for me "The Aero-Modeller" until further notice.

Signature_____ ***April, 1939***

Address_____

Made and printed in Great Britain by the Sidney Press Ltd., London and Bedford, for the Proprietors and Publishers, the Model Aeronautical Press Ltd., Avenue Chambers, Vernon Place, London, W.C.1. Trade Distributors: Horace Marshall and Son Ltd., Temple House, Tallis Steet, London, E.C.4—C1601. Sole agents for Australia and New Zealand: Gordon and Gotch (Australasia) Ltd. Registered at the G.P.O. for transmission by Canadian Magazine Post.

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"CLOUD" SUPPLIES WINGS FOR YOUNG ENGLAND

(See page 362 for Engine and Petrol Models)

THREE OUTSTANDING DURATION MODELS

THE CLOUD NIPPER

Wing span 26 in. Length 17½ in. Weight 2 oz. Designed by R. J. O'Neil. Designed especially for the beginner. The fuselage, tail-plane and fin are all made of sheet balsa wood. Construction is very simple, and materials supplied are ample. Entire kit, with instructional print. Finished propeller. Wing ribs stencilled out to facilitate accurate cutting.

Price 6/6 complete. Postage 6d. extra.

THE CLOUD ZENITH

Span 36 in. To S.M.A.E. formula. Weight 3½ oz. Designed by R. J. O'Neil. A real pedigree model specially designed for general flying and competition work. The forerunner of this model had a great number of successes to its credit and was the winner of many trophies. It is an all-weather machine, and due to its inherent stability it may be flown in high wind with every confidence. A "Zenith" was taken for its first trials on a very rough day in December; the results were as follow: 1st flight—a hop. 2nd flight—2¾ min. 3rd flight—5 min. out of sight. When you build your "Zenith" be sure to put your name and address on it. Price of super kit with finished propeller and cut-out wing ribs.

Price 10/6. Carriage 1/- extra.

THE CLOUD PIXIE

Span 24 in. To S.M.A.E. formula. Weight 1¼ oz. Designed by R. J. O'Neil. The thousands sold indicate its worth. To build one makes you a sure convert to the happy throng of satisfied aero-modellists. Price of complete kit, including finished prop., ready-cut ribs, print and ample supplies of everything needed.

Price 5/-. Carriage 6d. extra.

PACIFIC ACE

Lightweight Duration Model. 30-in. span

Price 3/6. Postage 6d. extra.

A DE LUXE SLIDE RULE

Makes all figure work easy. Multiplies, divides, squares, cubes, reciprocal values, extraction of square roots, diameter of circles, area of circles.

Price 2/6. Postage 3d. extra.

SOARING GLIDER

31½-in. span. Simple to build.

Price 3/. Postage 6d. extra.

AMCO WACO S-6

The five place WACO sport biplane is so rigidly built that several South American countries have fitted them for military duty. Model has compass, radio, aerial, etc. 33 in.

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Appendix - Links to the plan

The Hawker Hurricane by D.J. Miller
80" Petrol Engined Scale Model description
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A High Climbing model aeroplane by C.E. Bowden
59 1/2" Petrol model for 2.5cc engines. 1/4 Scale drawings and description
Document Page: 34
Document Page: 35
Document Page: 37

GIVEN AWAY FREE——
FULL-SIZE "WAKEFIELD" DESIGN BY M. FILLON

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