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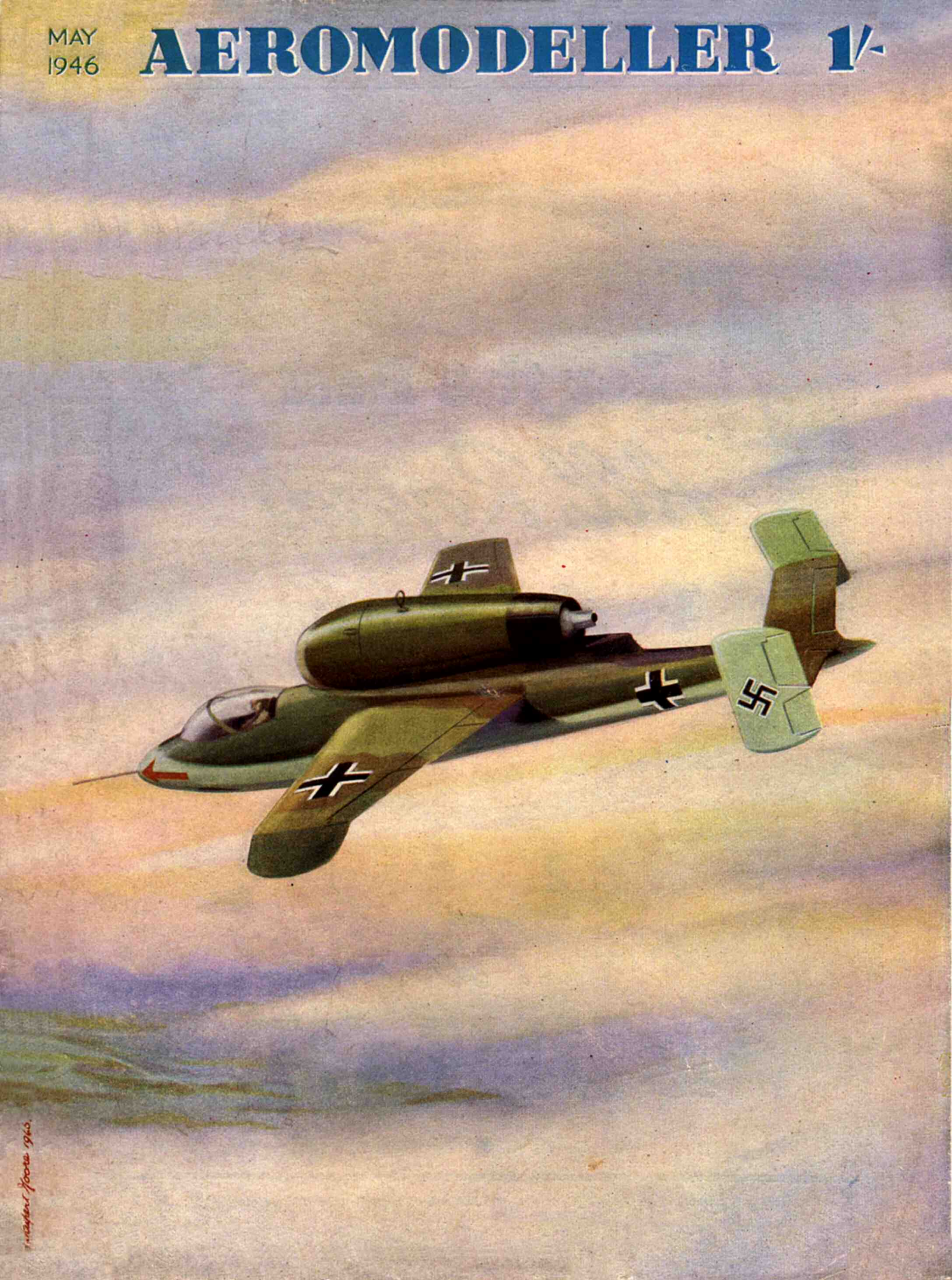

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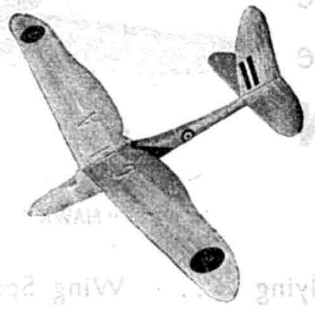

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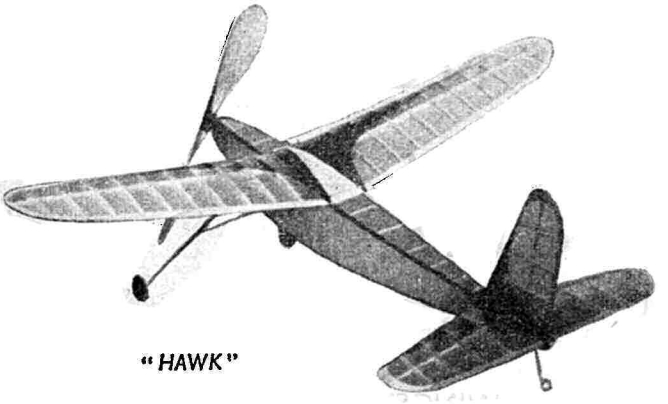

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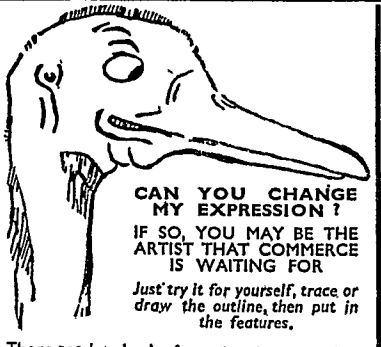

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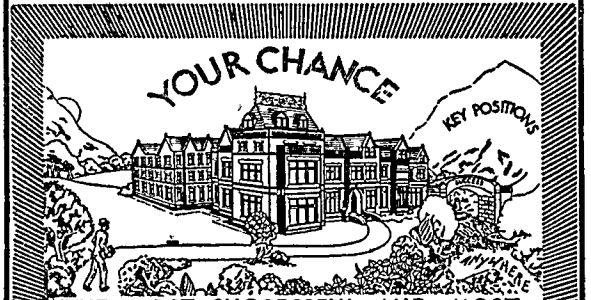

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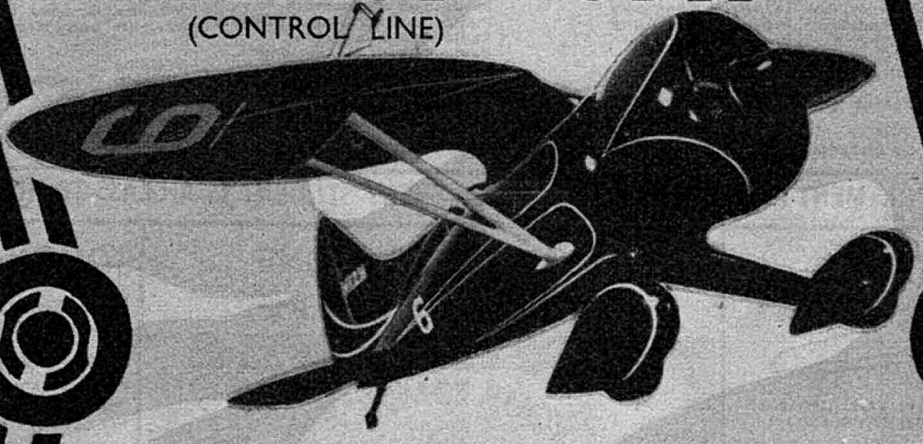

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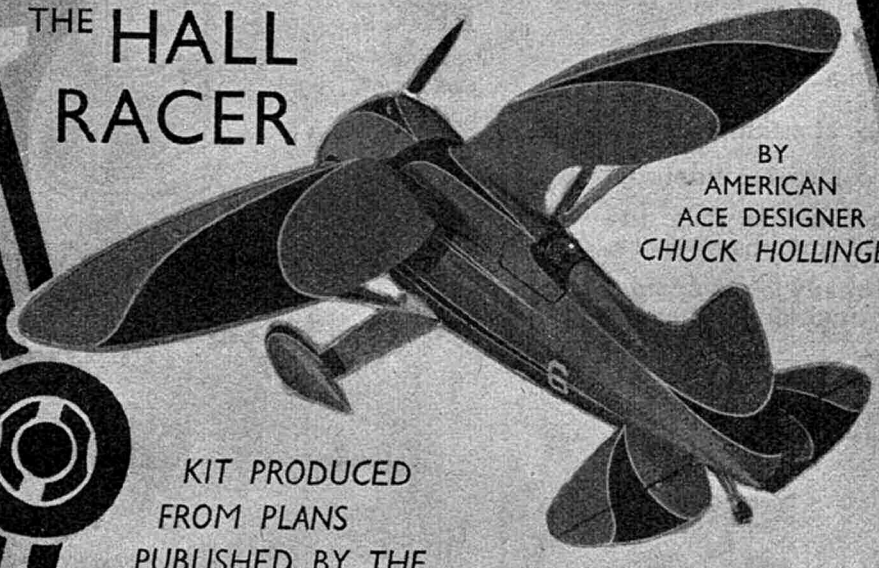

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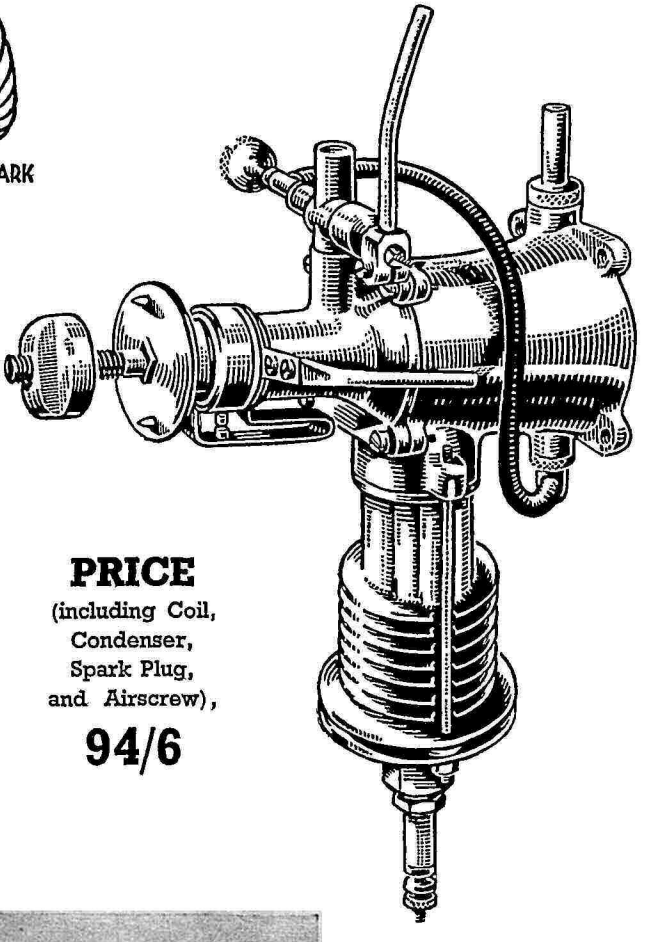

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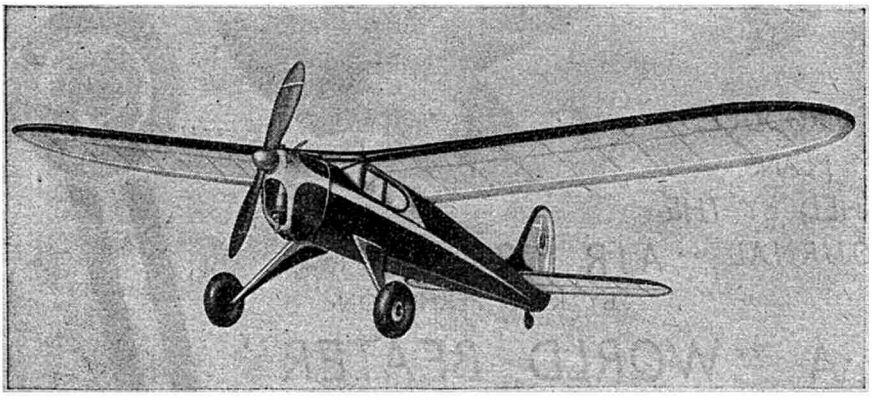

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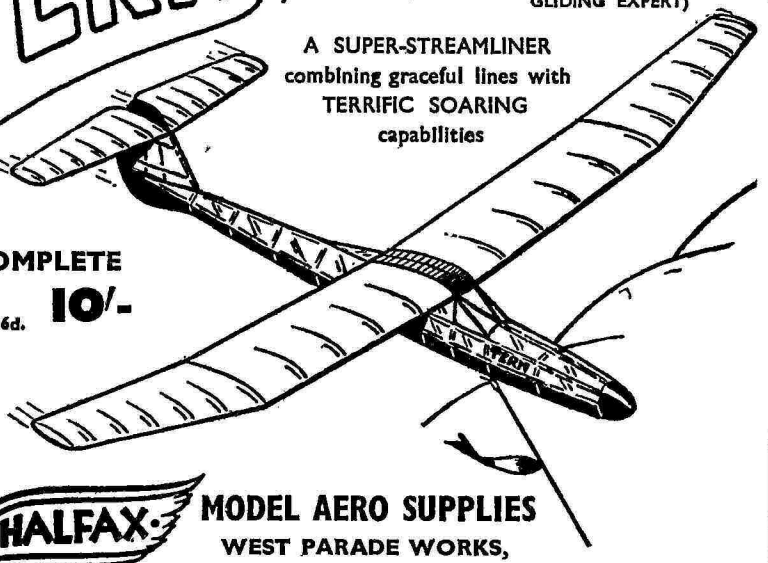

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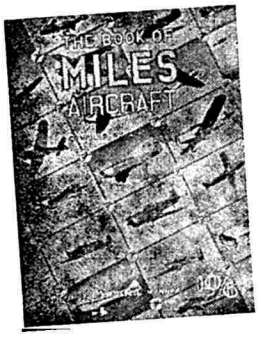

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Contents

SEA AIR. A Slingsby "Kirby Kite II" soaring over the Yorkshire coast at Scarborough. The photo is by Harry Bennett, F.I.B.P., A.R.P.S., Walker's Studios, Scarborough, and the *model* was made by R. Walkland.

EDITORIAL

FIRST BRITISH DIESEL

THIS month we have the very great satisfaction of publishing the design of an authentic British Diesel engine for installation in model aircraft. For several years, engineers of the Aeromodeller Research Department have been engaged in exhaustive investigations into the whole subject of miniature compression ignition engines and suitable fuels for their operation. Examples have been obtained of every known version, Continental or British, as a basis of study. Extensive mechanical and metallurgical research has been undertaken, and the results of these activities have been embodied in several designs, the first of which is described by Mr. Lawrence H. Sparey, who, it will be recalled, joined our organisation some time ago.

We are proud to be first in the field with this very obviously desirable development in motive power. The new engine is of a conveniently intermediate size—5 c.c.—and we have withheld details until, in the expressive phraseology of our friends across the Atlantic, " all the bugs have been ironed out of it." This engine has been well tried and tested, and has proved efficient and reliable. Demonstrations of the prototype have been given before a number of the foremost engineering societies in this country, and never has it failed to start easily and perform with complete satisfaction.

A further interesting point is that after hours of running, it shows no signs of the early demise that had been forecast for the miniature Diesel by those pundits who never hesitate to speak authoritatively, and generally in pessimistic vein! It may be said, however, that despite its comparative simplicity and fewness of components, the construction is not " anybody's job." We do not wish to convey the impression that it calls for genius, but certain parts do require accurate working. However, it should be within the scope of anyone who is not an incurable " bodger " and who possesses sufficient keenness to undertake painstaking work. No elaborate workshop equipment is needed to produce an entirely satisfactory job.

Elsewhere in this issue will be found illustrations and a detailed description for the enlightenment of the would-be constructor. Next month we propose to go further and publish not only a full test report of this engine by our Research Department, but also a comprehensive survey of a whole range of Diesels which the department has been testing. This will be an " honest-to-goodness " report in which the points for and against each engine will be frankly stated. No one is offering us any kind of inducement to push a particular product, and we shall record exactly what we have found during our prolonged investigations. Further reports on modern Diesels and their operation will be given from time to time.

THE MODEL MECHANIC

In addition to a Diesel design, we are able to announce a new magazine, THE MODEL MECHANIC, the first number of which will have been published just prior to this issue of the AEROMODELLER. It is published by the Drysdale Press, Ltd., one of the associated enterprises under the directorship of Mr. D. A. Russell, M.I.Mech.E., which include the AEROMODELLER, The Aeromodeller Plans Service, Ltd., the Harborough Publishing Company, Ltd., and Air Review, Ltd.

The new magazine appears at an opportune moment, for the ranks of the modelling-minded have lately been augmented by many recruits of both sexes who, drawn into the engineering profession through the exigencies of war, have discovered therein a fascination and a mechanical dexterity that they are only too glad to be able to retain through the medium of modelling. All those associated with the enterprises are practical modellers, and they have at their disposal the extensive resources of a soundly established research department, the only one in the country devoted to modelling interests. Managing Editor is Mr. D. A. Russell, Editor is Mr. Sparey, assisted by Mr. D. J. Laidlaw-Dickson, and contributors who are experts in the various branches of modelling. The first issue consists of 40 pages, 9½ by 7¼ ins., on art paper.

The policy to be pursued is set out succinctly in the editorial as " Anything that furthers the interests of models and model-makers." There are sections devoted to light engineering, locomotives, race cars, ships, and aeronautics. In the engineering section there is an article on a really efficient pocket blowlamp which should prove invaluable to builders of model aircraft and power boats. There is also a description of a sparking-plug weighing one-third of an ounce, a contribution on how to make a microscope, and a two-page spread of " do " and " don't " pictures for the beginner.

The locomotive section is devoted to the first instalment of a constructional article on a simple 3½ gauge Pacific passenger-carrying engine which should suit anyone who wishes to tackle a fairly big job but is not overburdened with spare time. In the aeronautical section there is a description of a small petrol-engined high-wing model suitable for the beginner. The section devoted to race cars contains a description of a freelance design with a 5 c.c. motor, details of a light-weight accumulator, and car wheels made without a lathe. The subjects dealt with in the ships section include a model yacht, an air/sea rescue launch, and a geared rubber drive. To round off, there is an interesting " Scrap-box." The magazine throughout is lavishly illustrated with excellent photographs.

A further point, and an important one, is that the magazine is to contain a live club section. The club movement is flourishing, and there is no doubt that news and ideas from this quarter are keenly followed by many enthusiasts. The MODEL MECHANIC invites that hard-working body of people, the club secretaries, to send along news items, opinions, and invitations to their special days, so that the invaluable club spirit may continue to be fostered. We might also, perhaps, make the point that the new magazine, catering as it does for all branches, should be invaluable in fostering mutual understanding and appreciation throughout the entire family of modellers.

The price per copy of the MODEL MECHANIC will be one shilling and threepence. During its first few months

of publication the continuing limitation of paper supplies must of necessity restrict circulation, however high the potential. Would-be readers are therefore advised not to risk disappointment by leaving things to chance. It would be better to give a definite order to your newsagent to deliver a copy each month, or send a remittance—18s. 6d. brings you 12 issues post paid, including a double Christmas number—to the MODEL MECHANIC, the Drysdale Press, Ltd., Edward Buildings, Rutland Street, Leicester.

Insurance for Jet Models

Some years have now elapsed since the AEROMODELLER took the initiative in securing insurance cover for the individual modeller, which eventuated in the National Guild of Aeromodellers.

Now a new phase in aeromodelling is beginning. Sundry rocket-propelled jobs have made their appearance, and this month's AEROMODELLER contains a reference to a jet-driven model that has been flown with success. Further, experiments are known to be proceeding in many quarters.

The latest insurance of the N.G.A. should be conducive to an increasing and responsible development in the new field of aeromodelling activity. To take advantage of the new facilities, owners of jet or rocket models should register with the N.G.A., sending a brief description of each model to be insured, and forwarding an appropriate remittance. The rates are double those for petrol models. As with that class of model, there is insurance cover for third-party against the *aeromodeller*, and the charge in this category is 5s. per annum irrespective of the number of jet or rocket models owned. Then there is cover for the loss, through out-of-sight flights or other causes, *of a model*, and the charge in this category is 4s. *per model*.

No one can doubt that, with the advent of jet or rocket craft, the face of the aeronautical world will be changed completely within the space of a few years, and it is equally certain that the aeromodelling community cannot afford to remain content with propeller-driven petrol models, let alone propeller-driven rubber jobs. Nevertheless, development of the new and more ambitious types must proceed in a responsible fashion if harm and frustration are not to accrue to our movement. In announcing this latest insurance we would urge experimenters at all times to have in mind the rights and interests of the public and the good name of aeromodelling.

Air Review

Air Review, the periodical which the Harborough Technical Organisation took over last year, has developed into an aeronautical magazine de luxe and has now reached its fifth issue. This issue should still further enhance the reputation of this increasingly popular publication. It contains a long illustrated article on the evolution of the famous Hurricane-Typhoon-Tempest-Fury family of Hawker fighters by J. W. R. Taylor; a full detailed sectional drawing of the Bristol Brigand torpedo strike monoplane; a test flight report on the Messerschmitt Me 109 by "Grasshopper"; an article on the German aircraft and rocket weapons exhibited at Farnborough, and all the usual features, including a six-page Photograph Album, Air Gossip, book reviews and eight G.A. drawings of 1914-18 and modern aircraft. We would emphasise that *Air Review* is a publication for the enthusiast. Every description of an aircraft, factory, or squadron is the work of the Editorial Staff and is based on a personal visit. Every photograph marked "A.T.P. photograph" is a copyright product of one of our Associate Companies and taken by a staff photographer. Every aspect of aeronautics is covered in *Air Review*, which is outstanding in its excellent illustrations and for the balance kept between contemporary and historical subjects, and technical and non-technical articles.

In view of the continuing restrictive conditions in the publishing world, it would be advisable for those desiring a copy of the current issue to secure it without delay, as normally it is sold out within a few days of publication. The price is 3s., or by post 3s. 5d., and remittances should be sent to *Air Review*, The Aerodrome, Billington Road, Stanbridge, Leighton Buzzard, Beds.

"The Model Trader"—Circulation—Staff Vacancies

We are also happy to announce publication of a new fortnightly trade digest under the title of "The Model Trader". Annual subscription is 2/-: a small sum to pay for two dozen four page issues packed with a wealth of useful information on forthcoming attractions from this and our associated companies.

Will any model shop or trader who has not yet received a copy please notify us of his name and address, when the omission will speedily be rectified.

During recent months we have had several complaints from readers that their newsagents have been unable to accept an order for regular delivery of the AEROMODELLER.

During the war years the AEROMODELLER circulation has had to be "pegged," but recently small increases of paper have been made, allowing of a slight increase in the circulation. In anticipation of further increases, we look forward in the near future to being able to meet all requirements, and will be glad if readers who have had, or are now having, difficulty in obtaining their copy regularly, will write in giving the name of their newsagent.

Vacancies exist at the Offices at Eaton Bray for

A. An Aeromodeller Draughtsman (plans of all types of model aircraft for Plans Service and Aeromodelling/Editorial). Practical experience of aeromodelling is essential and a knowledge of perspective work would be an advantage. Age *must* be over 30 years. Salary £7 to £9 per week according to ability.

B, Lady Tracers. Vacancies for fine line and precision work—mainly 1/72nd scale three-view tracings. Salary £4 to £5 per week according to ability.

C. Two keen youths required for the "Aeromodeller" Editorial offices. Applicants should reside within travelling distance of Eaton Bray. Salary £2 to £2 10s. according to age and ability.

All applications will be treated in confidence and should be addressed to The Managing Editor, The AEROMODELLER, c/o The Aerodrome, Billington Road, Stanbridge, Nr. Leighton Buzzard, Bedfordshire.

AEROMODELLING IN HOLLAND

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

WHEN I write about aeromodelling in Holland, I have to begin by giving you a few details concerning the general state of the country, both during and immediately after the war.

Holland was occupied by Germans for five years, and you will never quite understand what this meant, unless you had the experience—which Heaven forbid.

During the winter of 1944-45, there were only four things uppermost in our minds—thermics, transport, food and Nazis; "T.T.F.N." for short. It was a matter of keeping warm without fuel, of getting about to forage for food, and of keeping out of the clutches of the Nazis. Towns were very nearly without trees after this terrible winter, as trees and all removable wood was used as fuel.

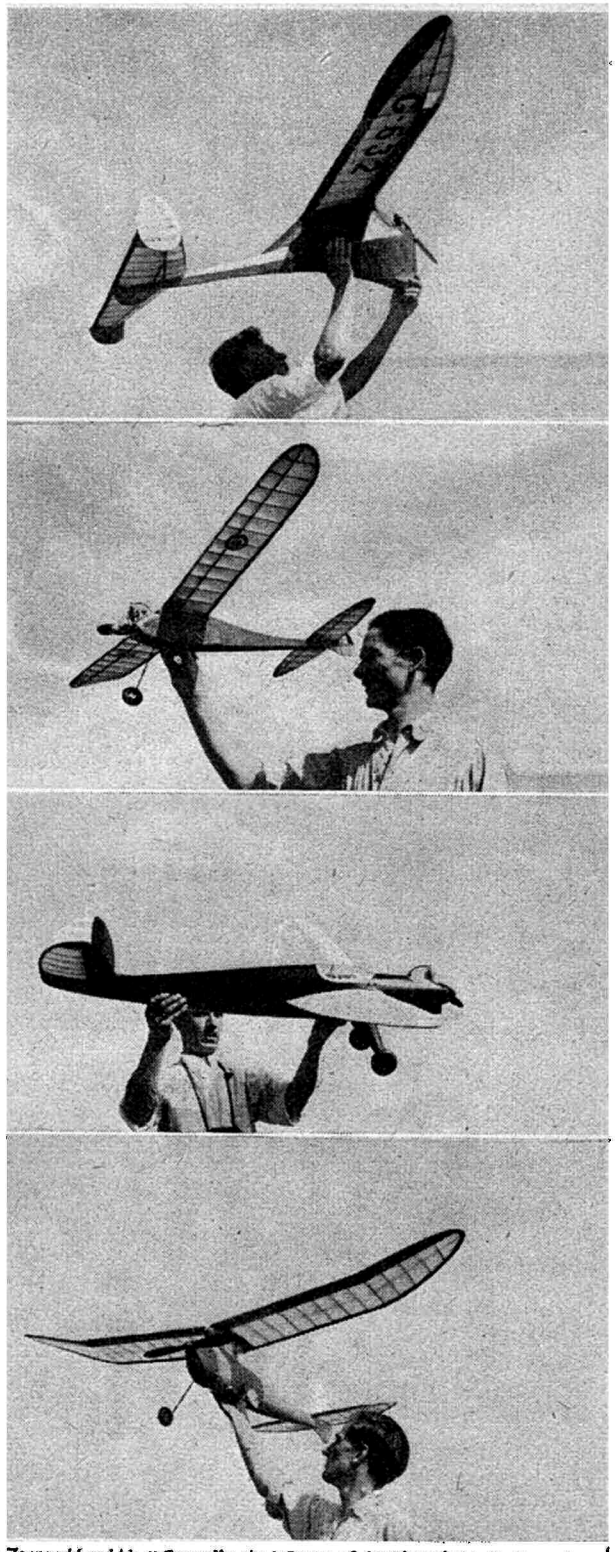
It will not surprise you to hear that there was little time or inclination to make models—let alone fly them. We just did not have the peace of mind or the energy. But that was only during the tail-end of the war.

Curiously, aeromodelling was on the up-grade until the summer of 1942. Quite soon after the occupation, the Royal Aero Club of the Netherlands, which governs aeromodelling, was forced to drop the adjective "Royal," but apart from that typical thoroughness in irrelevant details, the Germans left us alone. The Nazis and their quisling supporters, however, were keen to muscle in on the model game for two reasons. First, everything aeronautical had their very suspicious interests, second, the quisling youth formations were not very successful with the model side. So in July, 1942, we were "honoured" by the arrival of German-sponsored quislings in the R.A.C. Council. The result was not quite what they had desired. The entire Council and nearly all officials left the very same day! If they had wanted to assume control over a complete working organization they set about it the wrong way. Now, they had to do all the work themselves, and we were frankly interested to see what they would make of it. The result was poor, in spite of the fact that they had every kind of support we had always lacked. Technical advances there were none. Things were more strictly organised according to German precept, but everything they did was dull and unimaginative.

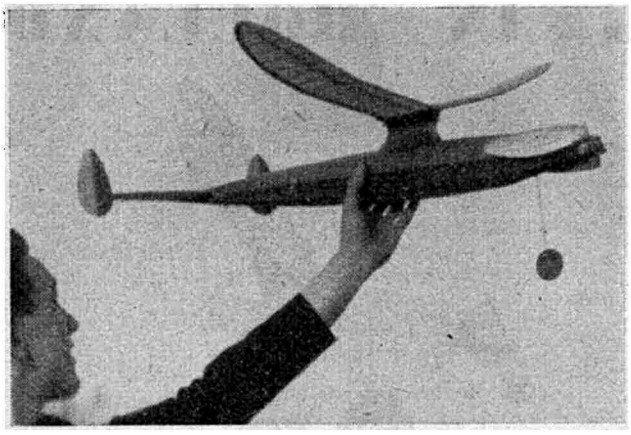
But the spirit of the "old" Royal Aero Club was not dead. A great many Clubs and members had resigned, following the example set by the Council. Although the club had voluntarily wound up its affairs, it remained practically what it was. Members met and discussed things, went to flying meetings, all despite threats from the desperate insurgent officials. Work went on. New designs came out, loyal members kept up a spirited correspondence. I must confess that it was sometimes hard to abstain from publishing plans and articles, but we had all agreed not to do this. Only two or three succumbed to the lure of cash and publicity. We kept silent, biding our time.

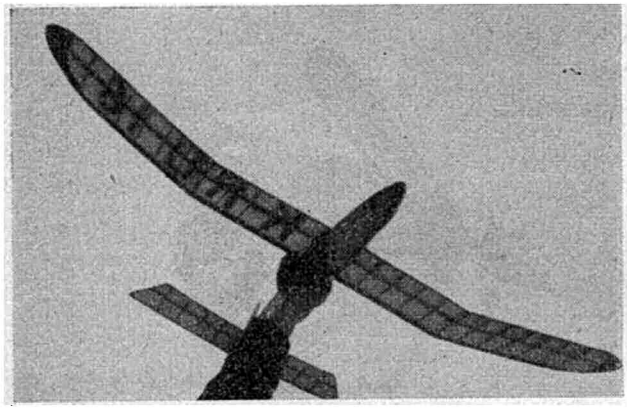
Those years were fruitful in a way, for they gave us the opportunity to review the organization and management, and plan improvements.

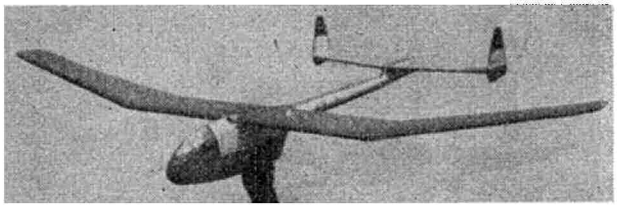
When we came back in May, 1945, it was not with banners and a brass band. The quislings had decamped

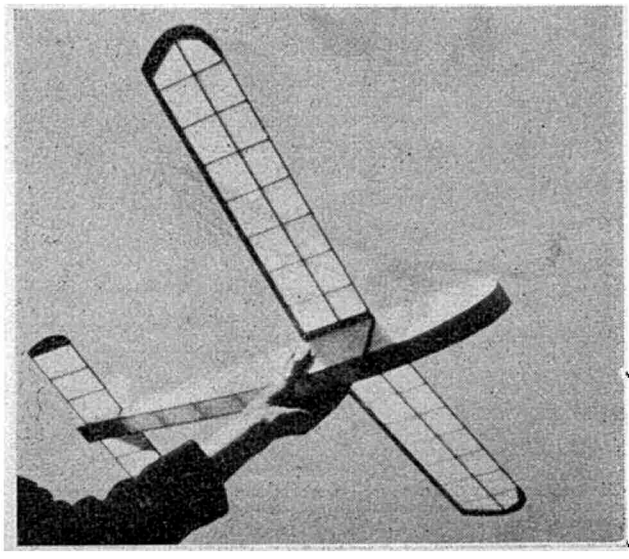


Four prominent Dutch modellers with their 1944 designs. Top to bottom: K. Zonneveld and his "Comet"; the influence of American design is apparent. L. K. Suls replies with a model more acceptable to British taste. W. Backer offers an exceptional mid-wing design. Note dihedralled tailplane and absence of fin. J. Bierens with his "Fire Nosa." All are powered by Brown except Suls', which has a .2 c.c. motor.









long before and had meanwhile been rounded up. We merely came in, surveyed our offices, chose a more comfortable chair and tried to settle down. We found most of our records still intact, including all the tracings of our plans service. However keen we were, there was not much to do! The telephone service was out of action, there were no trams or buses, no trains, letters still took weeks to arrive, newspapers were only just re-starting, and not even a bulletin could be printed. We found a small stock of materials on the premises but that was all. There was no wood to be obtained, and, anyway, there was no current to have it cut. Clubs that had no stock just could not build models.

Gradually we got things going. A big firm was kindly disposed and supplied us with spars of all sizes. By chance we found that a type of paper used in the making of telephone cables served very well as covering material. We discovered a store of three-ply, dope and glue, and all this was distributed amongst the clubs as fairly as we could, and our office sometimes looked more like a government place than the headquarters of a technical advisory committee! We had to become hard-hearted and turn away tearful requests for more materials.

While I write this, lack of materials is no more uppermost in my mind. We have done it. The Clubs still have to be very economical, but they can once more order through their model shop. That only applies to whitewood, ply, dope, glue and tissue. Balsa, motors, rubber and tools, are still off.

I give you all these tiresome details so that you can see our present work against the proper background. Now let me tell you something about the technical development of our sport.

In Holland the glider has been most popular since 1934. As I had done most of my aeromodelling either in England or in close contact with British friends—notably James Pelly Fry, D.S.O., R.A.F.—I am most attracted by the rubber-driven model, preferably of the Wakefield class. Being in charge of model flying in Holland, my job was not to follow personal preferences, but to map out the most efficient training scheme. The glider affords the best means for primary training, and we will continue to use this type for new members who have to get a general idea of model flying. They first build a small primary, and follow this up with a larger and more difficult secondary, after which they graduate to big contest models. When we can re-introduce propeller-driven models, they can decide, after the secondary, whether they want to continue on gliders.

Some very interesting and reliable gliders have been developed both before and during the war. We have reached a point where refreshing new ideas are scarce, but British practice has shown us different layouts which will certainly inspire our designers. You, on the other hand, may find food for thought by studying our types. Contrary to Sweden, which frankly admits having been influenced by Germany, we have more or less followed our own lines. Span varies from forty inches for beginners' types to six or seven feet for contest models, while secondary and small contest models have a span of about five feet.

(Top.) A typical example of the 41 Class mentioned by the author. The model shown was built by S. P. de Leeuw of Rotterdam.

(Centre.) "The Crow," an advanced training model popular amongst club members, built by H. Veenstra of s'Hertogenbosch, now in the R.A.F.

(Lower. Centre.) A design by a member of the Amsterdam Club which indicates the Dutch approach to pod and boom layout.

(Bottom.) "Mentor," a successful primary glider design by the author.

Rubber-driven models of the Wakefield type just disappeared and collected dust on the rafters, owing to lack of rubber. We kept up the game, however, by creating a new type along Flight Cup lines. It is a contest model, named Class 41. Only the amount of rubber was specified and limited to 30 grammes, plus or minus 5 grammes (0·88-1·17 ozs.). This resulted in many successful designs, and served the dual purpose of saving both rubber and balsa. Balsa disappeared from the market around 1942, but unexpected supplies came to clubs in the form of crashed Mosquitos, gliders and such! After the Class 41 model, a new type was originated, named Class 43. Here economy was carried still further by limiting the motor to exactly 30 grammes of rubber. The performance of both Class 41 and 43 was very good. We were pleasantly surprised to get flights of over five minutes, the small size being mainly responsible for " out of sights." But in 1944 these models, too, had to leave the stage to the gliders. Rubber had lost its kick after five years storage.

Now we are eagerly waiting for fresh supplies of rubber and balsa. If we had, say, ten pounds of rubber and thirty pounds of balsa, we could distribute this amongst the expert fliers and start training for the 1947 season. For the time being we must be content to design and build gliders.

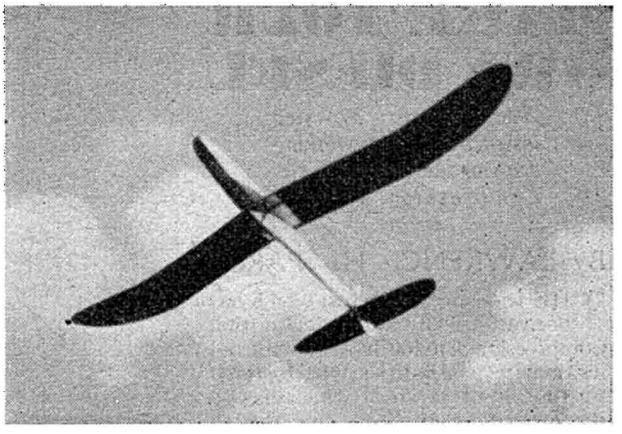
Petrol-driven models are popular, but the number of builders in this field is regrettably small. When we came into the war there were few motors in this country, and many of them are now worn out. A number of motors have, however, been designed and built by the members themselves, and these include one or two compression-ignition motors.

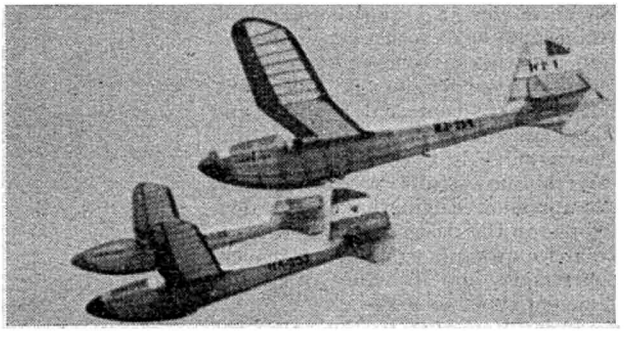
Quite recently indoor models figured in the news. The Rotterdam Club was responsible for this, and a record was put up of over three minutes. As no large halls were obtainable, flying was done in cinemas and big restaurants before or between business hours, sometimes as early as eight in the morning.

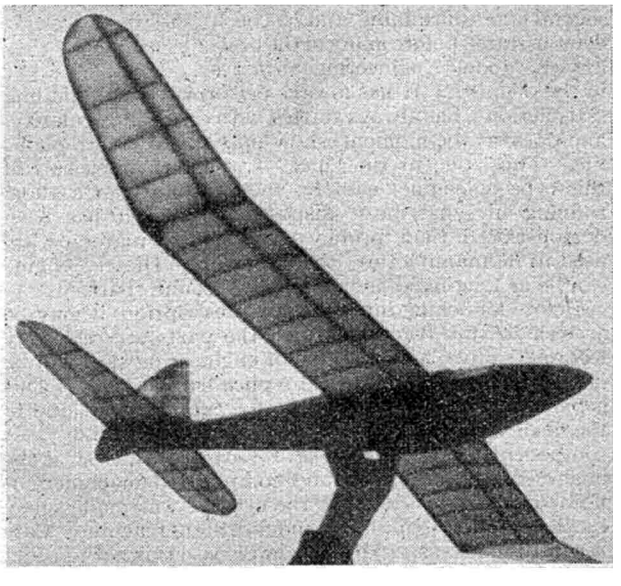
A big programme is planned for 1946. In April there will be regional contests in eleven districts, the winners meeting in the finals in August for the National Championships. The list also includes contests for tailless, canard and tandem gliders, petrol and rubber-driven models, a big " free for all " meeting and many inter-club contests for cups which have been carefully guarded in their hiding places.

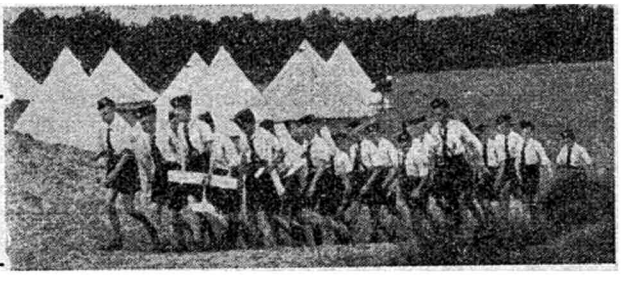
Let me now put in a plea for re-starting International model flying meetings in 1946, not necessarily on the lavish scale of the Wakefield contests, but meetings all the same. The aeromodeller is not so very keen on expensive and dignified banquets, believe me. He would much rather have an informal but cheerful meal where there is plenty of shop-talk and leg-pulling. And an element of austerity, provided it does not apply to the models, the flying or the weather, would do none of us any harm.

We must all get together again, for aeromodellers have been kept apart too long. We in Holland are quite prepared to give you a fair and hard battle for the honours!









(Top.) "Super Warhead," a contest glider of six feet wingspan well up in the clouds. Note sweepback and tip dihedral.

(Centre.) Unique shot showing three identical " Cumulus Chasers " in a formation flight.

(Lower Centre.) "Thermal Cruiser," another advanced training model by R. Schliekelman of Amsterdam.

(Bottom.) Robot modellers, members of the quisling Dutch Jeugdstorm set out for the flying field.

MAKE YOUR OWN DIESEL

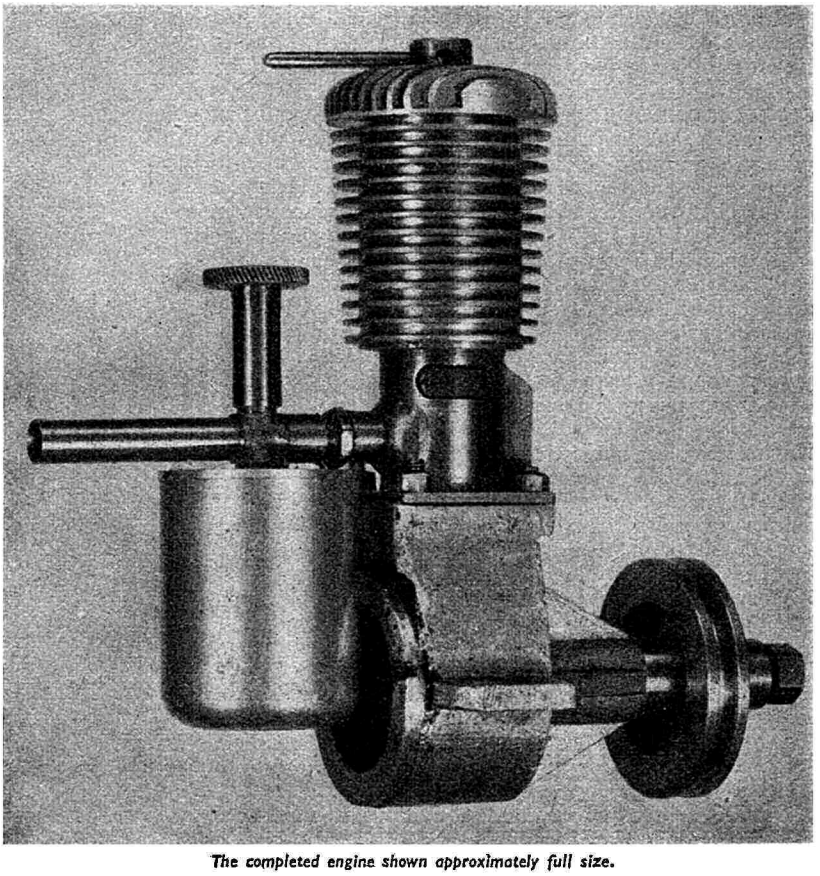
Detailed step - by - step instructions and working drawings to make a 5 c.c. Compression Ignition engine.

By LAWRENCE H. SPAREY

THE widespread interest which has been aroused by the model Ignition Compression Engine has, apart from its amazing possibilities, been fostered by the air of mystery which has so far surrounded it. Very few British experimenters seem to have done much in this field and there are still thousands of experienced model engineers who have never even seen a small Diesel engine in operation. Owing to exceptional facilities and help given to the writer by the Managing Editor of this magazine, several successful types of Ignition Compression Engine have been developed in the past couple of years, so that we are able to offer our readers particulars and drawings of a very efficient type.

It is interesting to know that the prototype of this engine has done several hours of running, and has been demonstrated before many of the best-known Model Engineering Societies in the country. It has always performed with unfailing satisfaction; has always started with ease and regularity, and does, at the moment, show no signs of its strenuous life. Thus, one of the chief "arm-chair" criticisms of this type of engine, namely, the possibility of a short running life, has been disposed of, and it has been demonstrated that, provided the correct materials are used in its manufacture, the miniature "Diesel" engine can be as long-lived as its "petrol" counterpart.

Before launching into a general description, it may be as well to state that, although the parts are relatively few and simple, a fair degree of engineering skill will be necessary before a successful replica can be made. This is particularly so in reference to the cylinder bore, and to the fit of the piston within it. The fit and finish of these components *must be beyond reproach*, yet, lest it be imagined that extensive and complicated machinery is needed, it can be said that the original was made solely by the aid of a 3½ in. lathe and a drilling machine. Care is certainly necessary, but we emphasise this not in order to make the job appear unduly difficult, but to put the would-be constructor on his "metal"! from the start.



The completed engine shown approximately full size.

General Description.

Component No. 1: Crankcase.

This is machined from an aluminium casting—the only casting required in the engine. The wooden pattern for this is quite a simple affair, as there is no need to core the pattern in this small size. Dimensions may be taken from the drawing, allowing a few "thous" all over for shrinkage.

Machining is mostly plain boring and screwcutting, and the only dimension requiring particular care is that from the centre line to the cylinder seating, and marked as 1-1/16 in. on the drawing. It is also necessary to ensure that the seating for the cylinder is truly at a right angle with the main-bearing housing.

The best method of approach is, I think, to grip the bearing housing in the three-jaw chuck, and bore and screwcut the crankcase portion; also, at the same setting, face the seating for the crankcase cover, and drill and reamer the housing for the bearings. Now remove from the chuck, and mount on an angle-plate on the face-plate of the lathe, locating on the cover seating just machined. A long bolt through the bearing-hole and angle-plate will secure the job. Now bore and recess, as shown, and face off the cylinder seating.

The clearance for the connecting rod may be put in by hand with a small round file, or the job may be mounted on the vertical slide and the clearance milled in with a ¼ in. endmill. While thus set up, mill out the transfer passage as shown. It is advisable not to drill and tap for the studs at this stage, but to wait until the cylinder liner is made, and mark from this when in position.

Component No. 2: Crankshaft Web.

This is really part of the crankshaft (No. 11) which will be dealt with later. Attention is drawn to it here to point out the method of shaping the web, as this is necessary to the correct balance of the engine.

Component No. 3: Connecting Rod.

This is of 3 per cent. nickel-chrome steel, case hardened, or any high-grade steel of similar properties may be used. The original connecting rod was made

from a piece of old motor car half-axle shaft, obtained from a breaker's yard. Apart from the drilling and reamering of the bearing holes, this con-rod is mostly hand work with saw and files. It is not bushed in any way, but runs on the hardened bearings.

Components Nos. 4 and 5 : Piston and Cylinder Liner.

These are the most important components of the engine, and on their accuracy and finish the whole running depends. Except for the lapping there is only plain turning required on the liner. The thread, of course, will be screwcut, but the ports are best filed out by hand.

It is one of the characteristics of small Diesel engines that they run extremely cool, so that both the transfer-passage and the carburetter-boss are soft soldered on. This is quite satisfactory, as the cylinder never gets hotter than is just bearable by the hand. The parts should be well sweated on with a blowpipe, and this should be done before any lapping is attempted. Both cylinder-liner and piston are of 3 per cent. nickel-chrome steel, but neither of these components is hardened, owing to the difficulty the average amateur has in finishing hardened parts. Provided that a mirror-like finish is obtained in lapping, unhardened parts will be found very satisfactory.

The piston, which is deflectorless, calls for little comment, beyond suggesting that it should be made from a piece of steel about 3 in. long. The piston should be roughed out, and the remainder of the steel reduced in diameter so as to leave a shank by which the work may be held. This will be found to be most useful for both turning and lapping, and also for holding the work in the toolpost (packed up to a suitable height) for the internal milling operation. Do not forget that lapping is the *very last* operation on both liner and cylinder, so that all work—such as the filing of ports, soldering, and the drilling of the gudgeon-pin holes in the piston must be done first. An advantage of leaving a shank on the work is that it can be finished, lapped and fitted, and then carefully parted off in the lathe, removing the small parting-off burr with a fine Swiss file.

Component No. 6 : Contra-piston.

This is turned and lapped on a shank as was done for the piston, and here again a very fine fit must be ensured. However, as the contra-piston has but a very slight adjustment movement, a sliding fit is not required, and it is advised that the contra-piston be made an easy tap-fit within the liner bore. Leave the floor of the contra-piston $\frac{1}{8}$ in. thick as shown, and do not attempt to thin it down for the sake of lightness. When the engine is running considerable pressure is exerted on the floor of this piston against the bottom of the adjusting screw.

Component No. 7 : Cylinder.

This is a plain aluminium turning from a piece of $1\frac{1}{2}$ in. diameter stock, and calls for little comment. No difficulty should be encountered anywhere, as it is not necessary for the cylinder to form a gas-tight joint with the liner. In the drawing a finned head is shown, and the photographs will demonstrate that a nice appearance is given to the finished engine. The fins are milled in the lathe, using a $\frac{1}{16}$ in. slitting-saw, with the job on the vertical slide. However, should the builder not wish to go to this trouble, a cylinder head with plain, turned fins will serve. Finning on these small Diesels seems to be more a concession to appearance than efficiency.

Component No. 8 : Compression Adjustment Screw.

Turned and screwed 1 B.A. from mild steel rod. The thread should be a good fit in the head. The lever is a piece of 1/16 in. silver steel tapped into the screwhead.

Component No. 9 : Gudgeon Pin.

This is of silver steel, hardened and tempered to a dark straw colour. End pads of brass should be fitted tightly into the gudgeon-pin holes in the piston.

Component No. 10 : Propeller Boss and Pulley.

The most convenient and safe method of starting small Diesel engines is by means of a cord and starting pulley. This pulley is of mild steel, and must be a very secure fit on the crankshaft. To this end, a taper is provided, and locked by means of a nut. It is advisable to make the crankshaft first, so that a suitable flat reamer may be made to the identical taper after turning the shaft. This will be enlarged upon in the next paragraph.

Component No. 11 : Crankshaft.

This is of 3 per cent. chrome-nickel steel, and is unhardened. The diameter of the shaft is given as 5/16 in., but as the bearings (No. 12) have to be lapped, it is advisable to make these first, and to turn the crankshaft to fit, as lapping may increase the bores a slight amount. The whole crankshaft is turned from the solid bar by the usual method of offsetting on centres. The shaft must be parallel, and bear a very high finish, as this influences the wearing qualities greatly.

The taper for the starting pulley should be turned off the top slide which is set to the correct angle. Make this the last job on the shaft, so that the work can be removed without interfering with the setting of the tool. Remove the centres from the lathe, fit the three-jaw chuck, and grip a piece of 5/16 in. silver steel. Now, with the same tool setting turn a taper on the silver steel. This will correspond exactly with the taper just turned on the shaft. On removing the silver steel, file it for the length of the taper to exactly half its diameter; harden and temper light straw. This will form a perfect reamer with which to make the taper in the starting pulley.

Component No. 12 : Main Bearings.

These are of *cast iron*, and are lapped to a fine finish with metal polish, finishing with white lead and oil. Turn the outside diameters, drill and ream in one setting. It will be noted that double bearings are used rather than one long, single bearing. This is done to avoid the possibility of the drill " running off," as it so often does when drilling long holes in cast iron.

Component No. 13 : Crankcase Cover.

Plain turning and screwcutting in aluminium. The only precaution necessary is to ensure that the inside of the flange is flat and square with the thread.

Component No. 14 : Carburetter Screw and Needle.

It will be noted that the needle of the carburetter is not threaded, but that it is soldered into an internally screwed cap which carried the adjusting knob. This system prevents excessive screwing of the needle into the jet. The needle is of 1/16 in. silver steel, and the cap is of brass.

Component No. 15 : Carburetter Body.

This is of mild steel, and is of fabricated construction. Take a piece of 9/32 in. mild steel rod, 2 in. long, and at a distance of $\frac{3}{4}$ in. from one end, drill a 3/16 in. hole clean through. Taking another piece of the 9/32 in. rod, shoulder this down for about $1\frac{1}{4}$ in., and insert into the hole just drilled. Now silver solder the whole lot together, making sure that the solder runs completely into and around the joint. This gives the foundation for the carburetter body, which now requires only to be cleaned-up, drilled, tapped and threaded as shown.

5 C.C. DIESEL ENGINE.

DESIGNED BY
L.H. SPAREY.

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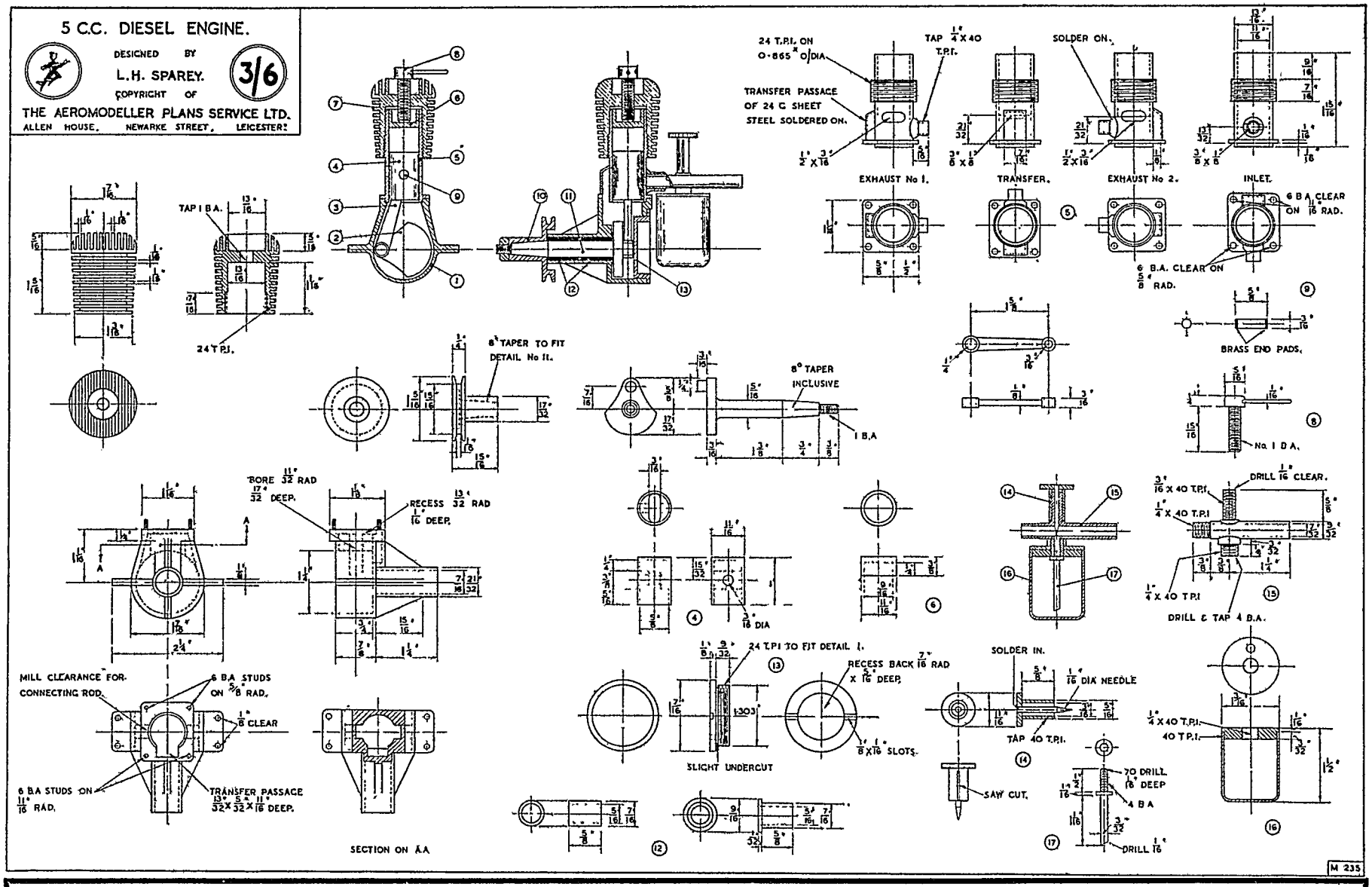

M 235

FULL SIZE PLANS 30 INCHES × 20 INCHES
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Component No. 16 : *Tank.*

In the prototype this was turned from the solid aluminium, but any suitable pressing which may be obtained would do. This is screwed to a circular top, which, in turn, screws on to the bottom of the carburetter body. Do not overlook the hole for the filler cap.

Component No. 17 : *Jet.*

This is made from a piece of ¼ in. brass rod, turned down to leave a flange as shown, and screwcut at one end to fit into the body of the carburetter. The jet is drilled with a number 70 drill for a depth of about ⅛ in., then, from the other end, the stem is drilled with a 1/16 in. drill until the hole just breaks into the jet hole.

Operation of the Engine.

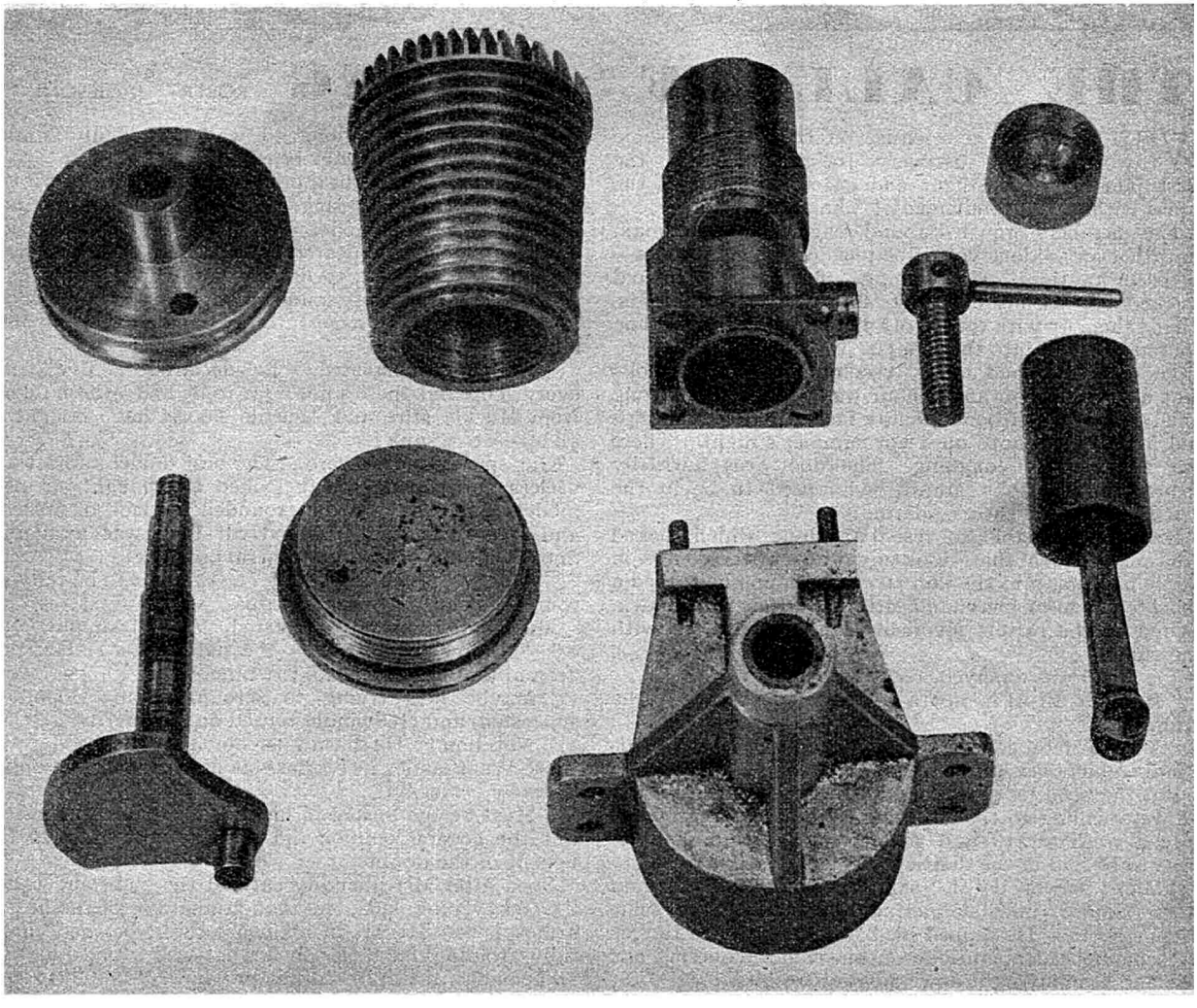
The fuel used in the prototype is one which has given extreme satisfaction, and with which the engine seems to yield its greatest power. The mixture consists of 50 parts of Ethyl Ether, 50 parts of pure Benzene, and 30 parts of a good quality, medium grade lubricating oil. Mix small quantities as required, owing to the rapid evaporation of the ether.

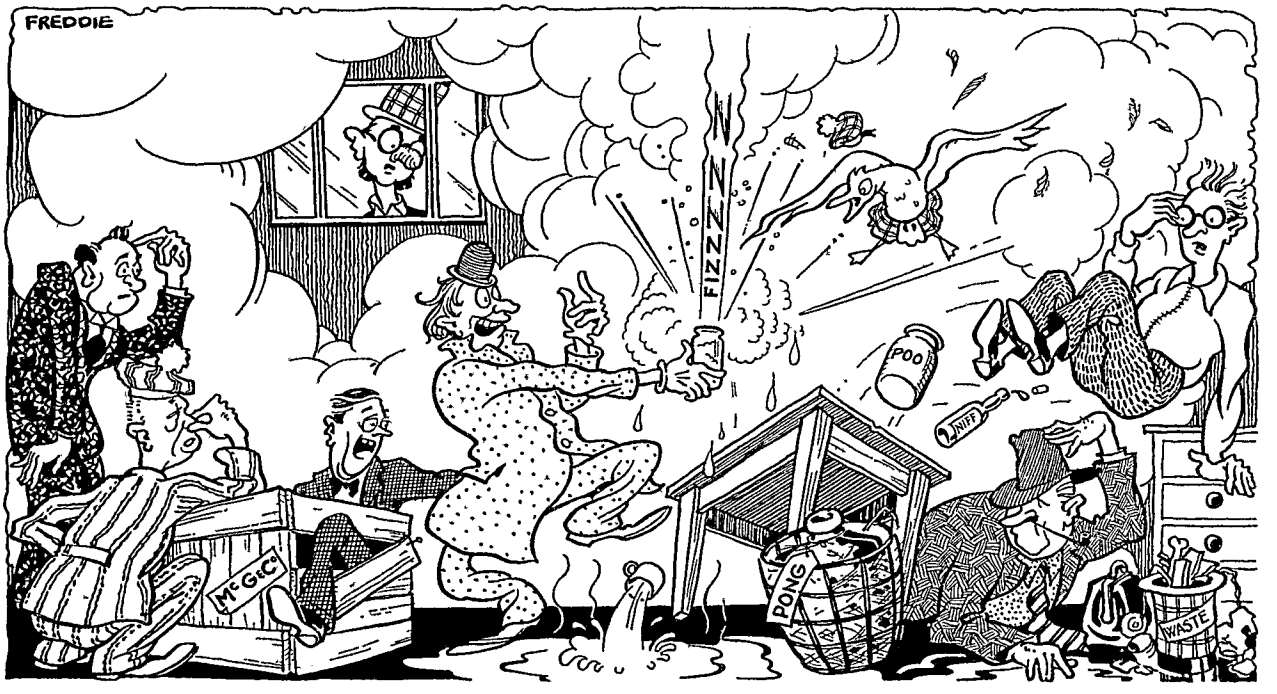
After filling the tank, and opening the jet needle about one complete turn, spin the engine over by means of the cord, several times to warm it. This will also suck fuel into the crankcase. Now screw down the compression adjusting lever until the engine fires, at the same time adjusting the throttle setting in an endeavour to obtain even running. Should the engine misfire in spite of throttle adjustment, it is a sign that the compression should be increased, so screw down the adjusting lever about a quarter of a turn and repeat the processes.

Throttle setting and compression ratio have a very marked connection one with the other, as the pressure needed to fire any given mixture is critical. Wrong settings will be denoted by a harsh, metallic " knock," which may be corrected by an alteration of the throttle setting. Once the engine is running, the best combination of compression and throttle settings can only be arrived at by experiment. If the engine runs with a pronounced " knock," no matter what setting is given to the throttle, it is a sign that the compression ratio is too high.

The propeller found most suitable for this engine is one of 13 in. diameter and 6 in. pitch, but this may vary according to the efficiency (due to variation in the precision of making) of the particular engine. Propellers of large diameter and relatively fine pitches have proved the most efficient for miniature compression ignition engines.

The finished components ready for assembly.





THE CALL OF SPRING

BY ROBERT JAMIESON

WITH the air of a scientist on the verge of some world-shaking discovery, Joe Small held up the glass jam jar to the light and gazed critically at the liquid within. "About ready!" he announced.

The members crowded round, eager for the climax. In rather an anxious voice Joe pleaded for more room—in case anything went wrong. Turning to an old cracked cup at his elbow he sniffed at the contents, stirred them up with the leg of an old undercart, and then poured the fluid into the jam jar.

There was a loud hiss. A column of white smoke shot up to the roof, and the air was filled with a strong smell savouring of bone manure factories, refuse dumps and fish supper shops on a hot summer's night. There was a spasm of coughing. The door was hurriedly opened, and Snooky Munro—who used to be in the A.R.P.—sounded the gas alarm.

Drambuie—unable to resist anything which looked even remotely eatable—took advantage of the confusion to dip his beak into the jam jar—whereupon he turned a delicate shade of khaki and, uttering a frenzied squawk, retired to the rafters feverishly fanning his beak with one wing.

Joe Small was annoyed.

"Hang it all—I'm not a professional chemist!" he protested.

"You're telling us!" Munro mumbled, with his handkerchief over his nose and mouth.

But the need for shrinking dope was so desperate that we were willing to try anything. The Spring rally was only a week away—and there wasn't a thimbleful of dope to be had in the district.

"Might as well try it," said Small, and looked again at the liquid, now simmering malignantly like some witch's broth. He dipped his brush carefully in the jar and commenced operations on his model, covering one side and then laying it down to await results.

He did not have long to wait. Suddenly Munro shouted. "Look at your brush!"

The bristles had disappeared—as had most of the handle. Small's jaw sagged, and then a sudden crack drew all eyes to his model. The tissue on the doped side had completely disappeared and the stern post was coyly bending over—trying to link up with the nose block.

Then a heavy step sounded outside and McSwindle entered. He made a gesture of despair and sank into a chair.

"I'm fair exhausted," he declared. "I've tried every shop, but there's not a jar to be had—those pikers from Muckle Mire and Teuchle Toorie have bought it all up—we're sunk!"

Our spirits sank to zero. The best model aircraft are useless without dope. It looked as though our new models would have to be grounded for lack of finish—and our rivals had collared all that was available. Snooky Munro vented the general opinion.

"Where's old McGillicuddy? 'E ought to be rallying round the club at a time like this."

McSwindle looked disgusted. "Well might you ask—I know where he is—the old twister! Hanging around that aerodrome all the time."

"Maybe he's trying to scrounge some dope," I suggested, and McSwindle turned on me angrily.

"Not him! He hasn't as much in his head. It's those Waaf lassies he's after—at his age, too—he ought to know better."

"Must be the Spring in his blood," Munro suggested, but the general opinion did not give the Maestro the benefit of the doubt.

Soon after McGillicuddy entered the club, and called "Good evening, lads," as though unaware of the hostile atmosphere. He sat in his usual chair, beamed cheerfully around, and then asked what was wrong—had we all been at a teetotal wedding or what?

"You know quite well what's wrong—no dope," McSwindle said, "and the president of the club not worrying much about it either," he added bitterly.

"Tach—is that all that's worrying you?" The Maestro smiled. "That's nothing to get in a stew about—I know where to get dope—not a great deal mind—but enough to do our turn."

Instantly his stock soared, and he was surrounded by members urging him to come clean and give details.

"No—No, lads!" he protested. "I can't give the source—you'll just have to trust me."

Munro muttered that he knew no one *he* was willing to trust less, but the need was so desperate that we let it go.

"There's only one snag," continued McGillicuddy. "I'm the least wee bit pressed for money—could I take it out of club funds?"

A few moment's silence followed. The members were not all willing, but after some heated discussion—to which the Maestro listened with the patient air of a man bearing slander and calumny for the common good—it was agreed to advance him five shillings.

"Could you possibly make it five and six?" the Maestro suggested timidly. "I'll need that at least."

After some further discussion the extra tanner was conceded, and the Maestro rose to take his departure. At the door he turned to us.

"Now don't worry lads—just leave everything to me—I'll get the stuff all right."

"Will you guarantee to bring it up tomorrow night?" McSwindle demanded.

McGillicuddy tilted his hat to one side and scratched his head. "No," he said slowly, "you better give me to the following night." And with that he went out.

The hope that had flared so brightly at the Maestro's promise, began to wane slightly when we met the next evening. While most of us still fondly believed that McGillicuddy would deliver the goods, the unveiled scepticism of McSwindle and Snooky Munro sapped our assurance: and the latter's final remarks summed up the feeling of the meeting. "I'll believe it when I see it."

Somehow the row of undoped models along the bench seem to mock us, and when Tumps McWhippet of Muckle Mire dropped in to pay a friendly call, they were the first things he looked at.

"What—short of dope?" he asked.

"No—we've plenty," McSwindle told him, "but we are waiting for some special stuff that McGillicuddy is scr—er—procuring—he's getting it tonight."

McWhippet's face creased into a leer.

"Is he now? Well he's certainly gone to a queer place to get it."

"What do you mean?" McSwindle demanded.

"Nothing—nothing," McWhippet said heartily, "but I saw him going into the picture's just before I came over here—the old man grinning all over his face, with one of those Waaf lassies hanging on his arm."

"And the best seats are two and nine! That's why he wanted—" Munro burst out, but McSwindle silenced him with a glare. "Aye," he told McWhippet, "Mac said he might drop into the pictures when he was over to get the dope."

We took our cue from McSwindle, and kept the home flag flying, but the moment our visitor was gone, the balloon went up. McGillicuddy was denounced as the most depraved, unscrupulous, wicked and treacherous creature ever known to mankind.

"But maybe he'll bring the dope yet," I suggested timidly, but they turned on me angrily.

"Shut up! You have always stuck up for him—the perishing old twister!"

The meeting was called to order, and it was solemnly decided that the Maestro be suspended from his office, pending a full enquiry into the case. The decision was surprisingly mild—as some of the more aggressive were for lynching him on the spot. Just when the meeting was at its noisiest the door opened and the Maestro walked in.

(continued on page 358)

WOT ? NO NOMOGRAPHS ?

SOONER or later every keen aeromodeller gets the urge to design his own model. No longer content with other people's plans he wants to be able to say " all my own work ! " There are two ways to approach the subject, either with a full knowledge of exactly what the designer wishes to incorporate into the model, backed up by the appropriate theoretical formula, or the more usual " rule of thumb," which so often degenerates into " hit or miss."

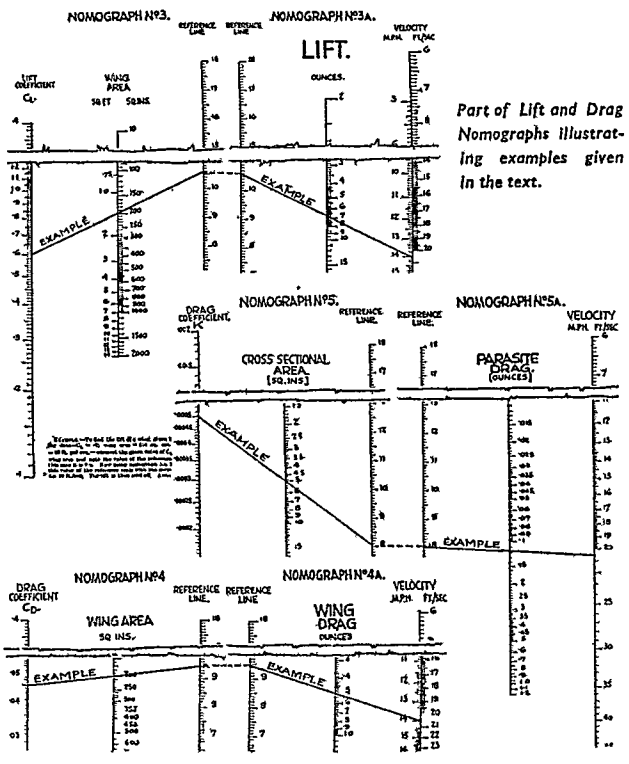
Now the less experienced will probably have only a rudimentary knowledge of theory. He may know quite well what he should allow for in his design but have little or no idea how to work out the often rather frightening formulæ. So he falls back on rule of thumb. But this is a method that only works out where there is a long train of models already built on which to base assumptions. The veteran modeller may be able to produce a winner every time this way, not so the beginner—he has no background.

It was for such a man that Nomographs came into being. So seldom is there a royal road to success that the apparent appearance of one is apt to rouse the doubts of the least sceptical. Perhaps you still doubt. You do not know how to use Nomographs ? Simplicity itself. Lay a straight edge across a series of tables and read off the answer in the appropriate column.

A demonstration will clear the air. What do we want to know ? What amount of lift will our projected model's wing develop at 14 m.p.h. ? Its area is 200 sq. ins., and the coefficient of lift is found from the aerofoil section performance graphs to be 0·6. Now the standard formula for lift is $L = 0{\cdot}6 \times \frac{{\cdot}00238}{2} \times \frac{200}{144} \times \frac{(14 \times 22)2}{15}$ —enough to put anyone off !

Now let us look at Nomograph No. 3, which gives us the solution without any of this. Simply lay the ruler across the three quantities and—lo and behold !—we have the answer where it cuts the lift scale—just under 7 ozs.

Again, we desire to know the drag of our machine. Let us take the wing first : when the coefficient of lift is 0·6, as above, we find from our data graph that the coefficient of drag is ·046. Instead of solving the formula



Part of Lift and Drag Nomographs illustrating examples given in the text.

$D = C_D \frac{\rho}{2} SV^2$ we lay our ruler across the three values and find it to be 0·51 ozs.—just over half an ounce.

The drag of the rest of the machine we obtain from Nomograph No. 5. For instance, our fuselage coefficient of drag is ·0005, and its cross-sectional area 5 sq. ins. Immediately we get the answer—·116 ozs.

" Nomographs for the Aeromodeller " by R. H. Warring, comprising twenty-four pages of charts and explanatory text can still be obtained from the Harborough Publishing Co., Ltd., Allen House, Newarke Street, Leicester, at 2/2 post free, or from local booksellers and model shops.

THE CALL OF SPRING Continued from Page 357

" I wonder you've got the brass neck to walk in here ! " McSwindle snapped at him, " misappropriating club funds—making us a laughing stock—"

" And the best seats are two and nine—and your cheek's all lipstick," Munro broke in.

" I can see," said McGillicuddy with dignity, " that my enemies have been busy. Is my explanation not to be heard ? "

" We're fed up listening to your bedtime stories," Munro yelled, " you're suspended ! "

The Maestro drew himself up, straining his braces to their utmost.

" And this is my reward—after all my efforts," he said bitterly, and turned to go.

" Did she not like having 'er 'and eld," Munro called after him, but the ex-president did not deign to answer.

The few remaining days before the rally were rather miserable ones for me. The Maestro's guilt seemed all too plain, and the comments of the members as they rigged up old models were very pointed.

The morning of the rally dawned bright and fair, and I wandered down to the field dejectedly, wishing the Maestro was present. He was, surprisingly.

The familiar figure was the centre of an admiring throng. The attraction was his new model—beautifully finished in a gleaming shade of red, glistening in the bright Spring sunshine. Stencilled along the fuselage was the name " Jungle Allure."

He gave me a friendly wink, and I waited till we were alone before demanding an explanation.

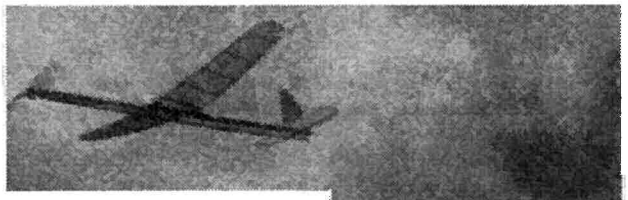
" Tact," be told me, happily. " Tact and discretion is all you need when handling women." I could have pointed out that lucre is an important factor but let it pass.

" But the name ? " I said, puzzled.

" That's the name of her nail varnish," he said. " She got six bottles in a present, it's as good as dope, and—" he stuck his tongue in his cheek, "—I managed to persuade her that the shade didn't suit her. If you boys hadn't been so hasty—"

OVER TO YOU

THE BOFFIN'S NEWS OF MODELLERS OVERSEAS



" The Boffin's concocted a wondrous idea
It's obvious to all from his horrible leer—
See his brain all fermenting
Overstrained from inventing
Some oddish collapsing contraption most queer."

Record-breaking Russians! *Official Soviet pictures of airminded young Russ a, issued during the past few months. In spite of their claim to hold thirteen out of eighteen world records the models shown appear hardly as advanced as might be expected.*

Oldest Ally.

Ruy Grancha—a Portuguese reader since issue Number 6—writes from Lisbon with news of activity in those sunny parts. The Ministry of Civil Aviation over there takes aeromodelling under its protective wing and has recently opened schools for instructors in model aeronautics. Ruy has been modelling for twenty of his twenty-seven years and built models in card, tin, wire, silk covered and balsa. Recently he has been trying the new Portuguese woods Choupo and Criptomeria, which though about twice the weight of balsa are correspondingly stronger. He mentions in passing " . . . we have good thermals and can usually see *flights of* 40, 60 *or* 80 *minutes regularly*, some to be registered with F.A.I. shortly." These are the Boffin's italics, who is now in training to stow away for these quite remarkable climes!

Palestinian Progress.

Another veteran reader, N. Kaufman of the Aero Club of Palestine (Jerusalem Branch), claims to be the first enthusiast to start modelling in that country. Beginning his career at the age of eleven he is now at work on his sixty-second model. He still finds time, however, to act as instructor to the local club, which is now doing its best to build up a substantial aeromodelling library.

Entente Cordialé.

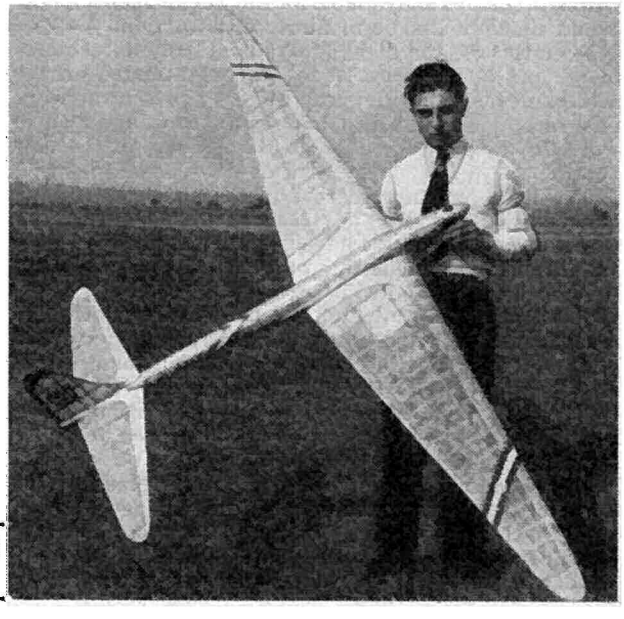
Our correspondent from the South of France, Guy Borgé, announces a French Championship for Tailless Models on May 19th, to be arranged in three classes, gliders, motor-powered models and jet propelled types. Rules are being distributed and will be forwarded to anyone interested and able to attend. The same correspondent lists some of the principal French engines now on the market. These include Moustic 5 c.c., Polymécanique, Airplan, Stab 2 cc. in the petrol class, and Rambaud 5 c.c., Dob 5 c.c., and Marquet 5 c.c. amongst the " diesels." Borgé adds " . . . we know only the names of Parisian motors . . . . Micron, Allouchery, etc., for it is much better for us to buy those made at Lyons and the South in view of the maintenance and spare parts service available from local suppliers."

Sumptuous Sumatra.

Far flung readers tell so many sad stories of makeshift materials that the Boffin is delighted to quote from Pte. P. Wright of Sumatra, who writes, " . . . vast quantities of balsa free of charge . . . nearly every house is panelled with hard balsa or obechi. I once knocked down a large shed for firewood . . . it consisted entirely of first-class white balsa—even to the supports and roofing panels . . . The charpoy I'm reclining on is nearly all obechi. Rattan cane and bamboo abound . . . there's a bamboo grove just beneath my window."

Balsa Butchers in Baroda.

The Editor of " Military Studies," Mr. G. M. Jadhav, tells us that he is building up a group of clubs in that far-off State. From accounts appearing in his journal—which covers a far wider range of subjects than its title suggests—he has secured the assistance of many influential figures in his task and certainly carries the Boffin's good wishes for its complete success.



French Winner—*and his model, taken at the first post-war model meeting held in the South of France, organised by the Rhône Club, who are staging their Second Annual Tailless Contest on May 19th.*

THE APPLICATION TO MODEL AIRCRAFT OF JET PROPULSION

PART IV. BY G · W · W · HARRIS

IT'S happened at last! The first jet-propelled model has taken the air and even if not completely satisfactory, *has* flown for two minutes. Here, as promised by Clubman, in April, is the gen. The unit was built by F/Lt. J. A Long of the Doncaster M.A.C., fitted into (or rather onto) an "Aeolus" glider modified for the purpose (Fig. 1). Two tanks were fitted into the fuselage pod, one containing meth. and the other compressed air. The tanks were interconnected by a balance tube and the fuel pressure was about 5 lb. sq. in. The jet unit was installed beneath the fuselage, slightly aft of the C.G. and allowance was made for small adjustments of the C.G. and thrust line by means of a movable mounting.

The unit (Fig. 2) was of the impulse duct type of athodyd with six flap valves, lightly spring loaded in the open position. Two heater coils were proved to be ample if the unit were sufficiently warmed before starting. Five jets were used and combustion was very good. The unit started with a rather powerful backfire, shutting the valves, and then ran fairly smoothly. It was found that the higher the fuel detonation point the lower was the number of impulses per minute, and the greater the thrust per impulse, but the thrust proved to be very jerky and unsuitable for model flight. With meth. the impulse rate was about 1,000 a minute and thrust was estimated at 12 ozs. This figure is, however, very approximate, as the ram effect of the inlet air increased the thrust to a certain extent. Once the unit was running it was found that the valves did not close completely, but vibrated in the slightly open position. Several flights were made over a period of two days in early January, but F/Lt. Long modestly disclaims any remarkable results. He says in his account: "I do not consider the flight made by my model to be of any use as the model merely waffled round in a semi-stalled condition, gaining perhaps 3 ft. in height from the hand launch. Possibly, better results might have been gained with a model designed expressly for the motor, but with so little power available for the weight such a model would undoubtedly be of flimsy construction."

Nevertheless, the flight was undoubtedly an achievement, and F/Lt. Long is to be congratulated on the success of his pioneer effort. He is at present at work on a turbo-jet intended to drive an airscrew, and readers will wish him an equal or greater success in the new venture.

It will be remembered that in the article describing tests carried out on the Henwood Jet Unit (AEROMODELLER, January, 1946) readers were invited to explain the curious phenomena that occurred. A selection from letters received is quoted below.

The first is from Mr. John Gooch of Hounslow, who says "... when the unit has been running for a few minutes the preheating coils reach a high temperature and therefore the fuel is vaporised instantly it reaches the air at the jet exit, making instantaneous combustion. Further, when the unit attains a high speed R.T.P. I should imagine the centrifugal force would be considerable. Therefore, the fuel being also under pressure, the centrifugal forces would force the fuel along the fuel pipe to the jets, having the effect of increasing the pressure. Consequently a step-up in thrust results."

Next there is a very stout and painstaking effort from a member of the forces, O/Cdt. L. K. Lord, of Aldershot. He is not content with just producing an answer to the phenomenon, but presses on with suggestions as to how it might be initiated. O/Cdt. Lord begins "... fuel is probably wholly or perhaps only partially vaporised before passing into the combustion tube, where upon contact with the hot walls of this tube, the fuel and air mixture detonates as distinct from merely burning and a compression wave passes along the jet tube to the atmosphere. This compression wave will be followed by a relative rarefaction so that, in fact, a series of alternate compressions and rarefactions passes along the unit in much the same way as an organ pipe, with the probable difference that each zone of compression may expand and drop in pressure as it passes rearwards. In front of the jet ring a relatively normal moving column of air will exist, forced there by ram effects, whilst behind the jet ring the organ pipe condition will obtain. Thus, the perforated face of the jet ring—the face through which the fuel is injected—will be subjected to an alternate depression and back pressure. The depression will have the effect of temporarily increasing the pressure difference between fuel tank and combustion space, thus causing more fuel to be injected whilst the succeeding back pressure will reverse the effect and less fuel will flow. Thus the overall effect is intermittent fuel injection and intermittent detonation which, presumably, allows more complete combustion of the fuel with a corresponding increase of thrust. What seems to have been brought about—albeit accidentally—is that in place of a continuous combustion ram-effect tube, an impulse duct such as that of the Fi 103 (VI) has been developed. That, I believe, explains the phenomenon, but what is perhaps more important is how we can initiate it. It appears that certain minimum conditions must be attained, and once it does 'pulse' the phenomenon is maintained even whilst the unit accelerates, so I imagine that it is for practical purposes independent of speed. I think that since detonation is the keynote, the cause must be in the fuel to air ratio (governed to some extent by the dimensions of the combustion tube) and the type of fuel used. If my idea is correct, then the same unit using different fuel at the same pressure should alter the time at which pulsing occurs. The later tests carried out by Mr. Harris tend to confirm this latter point. In either instance the combustion tube should be really hot to promote vaporisation of the fuel, as otherwise the fuel will not detonate. I regard this as a matter of importance not only for its value in improving the characteristics of pure ram-duct jets, as Mr. Harris suggests, but also because care must be taken in the design of turbo-jet units in order that pulsation shall not occur in the turbine space. I imagine that the results of such an occurrence would be disastrous."

Mr. F. J. Foord of Mitcham has hit on a scheme for improving the Henwood unit which has been suggested to me by several other jet enthusiasts. He proposes "that an extra vaporising jet ring (B) be inserted in the combustion chamber so that as long as the unit is running the pressure in the fuel/air tank is kept up by means of the vapour from the ring (B)—see Fig. 3. The purpose of this addition is to cut down the size of the fuel/air

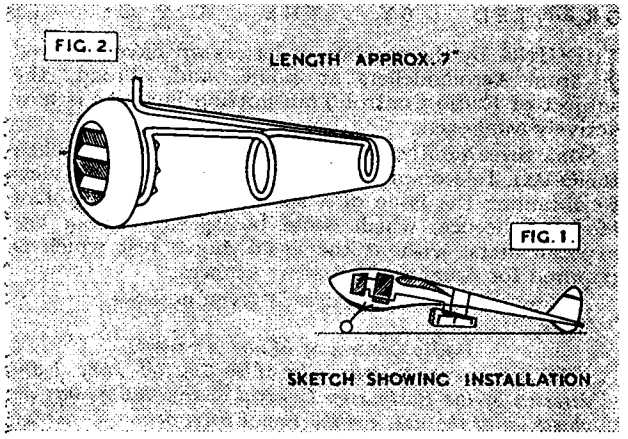
tank to a minimum, as this appears to be unnecessarily large and therefore weighty on Sgt. Henwood's model."

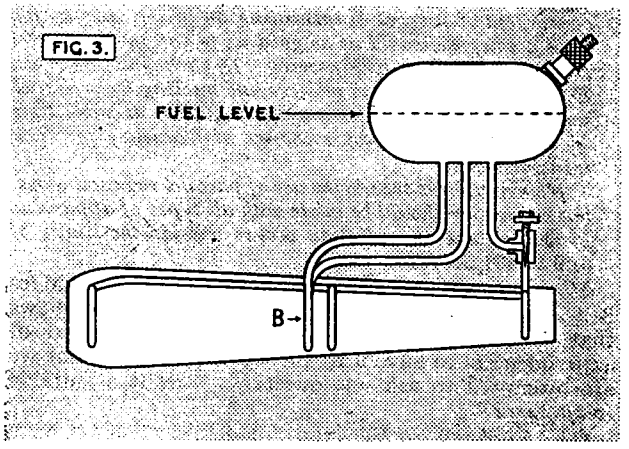
A final letter from Mr. Rendell, of Bishopstow, just about completes the picture. Exactly whose theory is right can only be discovered by practical experiments. Mr. Rendell says: "During recent weeks I have been experimenting with my own modification of a Henwood type model jet unit. Although I have not been particularly successful, I believe that I have found an explanation of the phenomenon of the 'intermittent burring sound' mentioned by Mr. G. W. W. Harris in his article in the January, 1946, AEROMODELLER. The hot gases on the combustion chamber not only set up pressure in the orifice, but, being enclosed, exert a back pressure on the jets themselves. I verified this by arranging for the jets to be gravity fed, leaving the top of the tank open for observation. The back pressure blew out the jets and caused a spout of fuel in the tank itself. With moderate pressure in the tank, and a rich mixture in the unit itself the back pressure is overcome. When the fuel pressure is increased the unit accelerates more rapidly, takes in more air, and burns a weaker mixture. With this almost explosive mixture, the back pressure on the jets is tremendously increased and overcomes the pressure in the tank, extinguishing the jets. The back pressure, however, rapidly dissipates and more fuel is forced through the jets and automatically ignited by the red-hot combustion chamber. This accounts for the intermittent effect, while the increased velocity of the unit is a result of the combustion of the weak mixture."

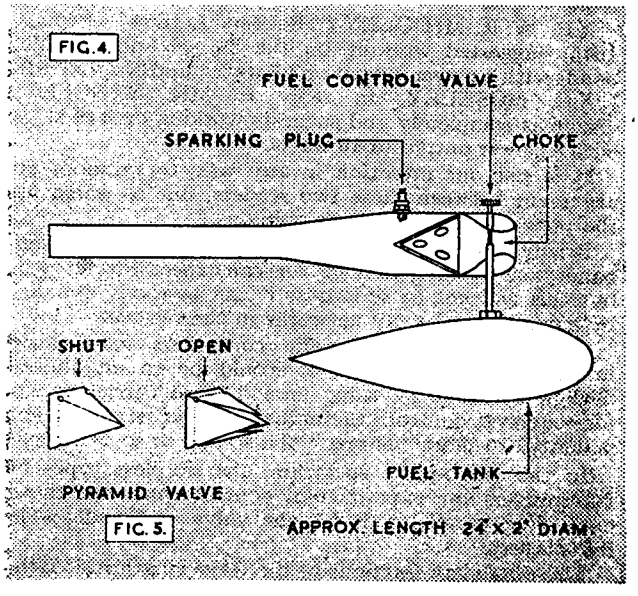
A British enthusiast stationed out in the States has sent over some gen regarding a new jet unit of the impulse type. Unfortunately, the details available are all too brief, yet at the same time are not without constructive interest. The unit is, it is understood, the invention of G. M. Gianni & Co., Pasadena, California, and is the result of intensive study of Nazi developments in this field. From the sketch, Fig. 4, it will be seen that basically it consists of a choke or venturi incorporating an adjustable needle valve for liquid fuel control. To the outlet of the venturi body is attached what appears to be a perforated cone, or tube, which serves as a combustion chamber and is fitted with a sparking plug. The combustion chamber is then tapered off and supplemented by a parallel nozzle pipe. For actual flight conditions the only additional item required to operate this unit is the fuel tank. The unit is built up from light alloy and stainless steel.

The starting technique is as follows: The sparking plug is connected up to an electric ignition coil and a blast of air is induced through the choke by means of an air compressor feeding through a small diameter nozzle pipe. Fuel is then admitted into the choke, the ignition coil switched on, and the vaporised fuel fired. The explosion leaves a vacuum causing a further charge of air and fuel to enter the now hot combustion chamber, and automatically ignite. The compressor pipe and ignition gear are then disconnected as the automatic cycle of operation will continue until the fuel (petrol or paraffin) is exhausted or turned off. The cone itself is somewhat puzzling—is it just a perforated cone, or is it of square cross-section with flexible sides that can open and shut? See Fig. 5.

The weight of the basic unit is 5 ozs. and it is stated to give a thrust of 2 lbs. At full throttle the explosion rate is in the region of 15,000 per minute, a considerably higher rate than any known Nazi impulse jet engine. It must be understood that although this particular unit is small it was not intended for model aircraft, but is part of a research programme carried out by its designers, and would undoubtedly be intended for high speed flight on a larger scale. Nevertheless, such a simple unit has possibilities for model aircraft if one is prepared to accept a much lower degree of efficiency.







• RADIO CONTROL NEWSLETTER •

By P · H · HUNT

BEING A DISCUSSION OF FACILITIES FOR MODEL CONTROL RECENTLY GRANTED BY THE G·P·O· TELECOMMUNICATIONS DEPARTMENT.

JUDGING by the number of letters we have received from Aeromodellers at home, and abroad, the subject of Radio Control Transmitting facilities is now actively awakened.

Some three months ago the AEROMODELLER approached the G.P.O. Telecommunications Department with a view to obtaining the issue of a special " Radio Control of Models " licence, which could be issued to *bona fide* experimenters, without the usual morse test which is required for Amateur Radiating licences.

A copy of the G.P.O's reply is given here :—

" *Sir,*

Radio Control of Model Aircraft.

With reference to your letter of the 7th February, I am directed by the Postmaster General to say that he has no objection to the use, for the time being, of the frequency of 460·5 Mc/s with power not exceeding 5 watts for the experimental control of model aircraft, but it would be convenient if persons transmitting on this frequency for such a purpose would be so good as to inform the Radio Branch, W2/6, Engineering Department, G.P.O., E.C.1, giving name and address and quoting the reference number 16311/46, *as it may be desirable at some time in the future to suggest a change of frequency for such transmissions.*

No objection is seen to the use of parallel rod oscillators, but endeavour should be made with all types of apparatus to ensure that no radiation occurs outside the limits of 460 *to* 461 *Mc/s.*"

Now, this permission granted for the use of 460·5 M/cs is a very definite step in the right direction, and shows that the G.P.O. are fully cognisant of the need of experimenters to have a frequency of their own, but we are prompted to ask one question : " Is it a suitable frequency ? "

Oddly enough, of the many readers' letters we have received, only two have actually specified actual requirements :

MR. W. R. MIDGLEY (" Readers' Letters " October, 1945) suggested working on the 28, 56 and 112 Mc. bands with a power output of 2·5 watts, and No. 1457816 L.A.C. MOSELEY, in reply to MR. MIDGLEY, disagrees completely and suggests working on 448 M/cs with a power output of 10 watts.

It is not our intention in any way to promote an argument between these two readers, but to weigh up the pros. and cons. of their opinions.

Briefly, the 28, 56 and 112 Mc. bands are amateur bands, and working on them, one can expect interference, but this will not be serious as it can be easily avoided by using slugged relay networks in the receiver.

Conversely, although radio controllers may cause interference to amateurs, it would be to an almost negligible extent as, using unmodulated carrier waves for sequence control, the actual time of transmission is limited to short " bursts " of a second or so at a time.

In the micro-wave spectrum, the simplest types of transmitters for experimental control work are those employing parallel rods for the valve grid and anode inductances.

These rods are fractions of the wave length in length, and must be rigidly supported with the minimum of surface contact by the supporting insulators.

In the transmitter construction this is not very difficult, and the whole oscillator can be built into a rotatable directional array, as it is not easy to get good power transfer along feed lines of any great length on such high frequencies, because of the possibility of radiation from the line itself.

The choice of suitable (and readily obtainable) valves for the transmitter is difficult, and one is more or less obliged to use " Acorn " valves, the 955 type giving a usable output at this frequency.

Receivers are difficult to design as they follow the general lines of the oscillator construction, using parallel or resonant line tuning systems.

Working on such high frequencies, receivers are very prone to modulation by vibration, and it means that the successful operation of a receiver in the immediate vicinity of a miniature petrol engine is problematical. Again, " Acorn " valves are indicated, the 958 being a good choice.

Micro-waves are, of course, easily beamed, and the aerial system is physically small for full wave-length operation.

Having briefly examined these two sets of conditions for the 56 and 460·5 Mc. bands, it seems clear that for easier working, along lines already thoroughly explored by amateurs, (as far as communications go) that permission to use a frequency anywhere between 28 Mc/s and, say, 112 Mc/s, or, at the very outside, 228 Mc/s, would be ideal.

Well, Reader, what do you say ? Write in and let us have your views on the subject. We would, however, suggest that the maximum power output requirement for whatever frequency you would like to select should be 5 watts maximum, and that, measured by oscillator valve dissipation.

Some readers have boldly suggested 100 watt outputs just to make certain of good control, but don't forget that good results can be obtained from 1 or 2 watts output as the maximum range envisaged with model control is only about half-a-mile radius.

Let us know by postcard, marked " RADIO CONTROL " (in block capitals), the answers to these three questions :—

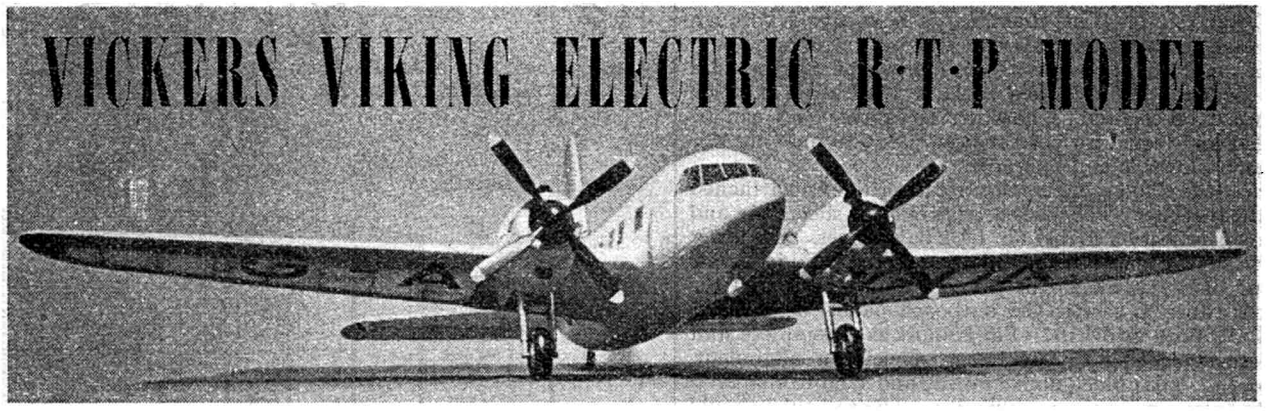
A. Frequency requirement.
B. Power output.
C. Type of control (*i.e.* AUDIO or SEQUENCE).

If, by your replies, a strong case can be brought before the G.P.O. asking for another frequency allocation at a part of the spectrum where working conditions and the design of the control apparatus are simpler, and less " academic," then we of the AEROMODELLER will do our utmost to have the situation reviewed.

However, don't forget that 460·5 Mc/s is open for our use, and that control work, although difficult, is not impossible.

Perhaps some of you have had plans for micro-wave control, so, if you have, let's hear about them and be the first to make use of the first frequency allocated for the radio control of models.

VICKERS VIKING ELECTRIC R·T·P MODEL



ELECTRIC R.T.P. flying places every conceivable type of aircraft within reach of the model enthusiast. Many of those who enjoyed watching the Vickers Viking at Dorland Hall expressed a wish to build one of their own, and these articles are the result. Next month the building and installation of the propelling and undercarriage motors; pylon and control box will be described. The Viking can be attempted by *any* aeromodeller who has built a successful scale model.

Fuselage.—Cut out fuselage backbones and pin over plan. Build up half-formers on the board and add stringers, except those that will be in the way of the wing.

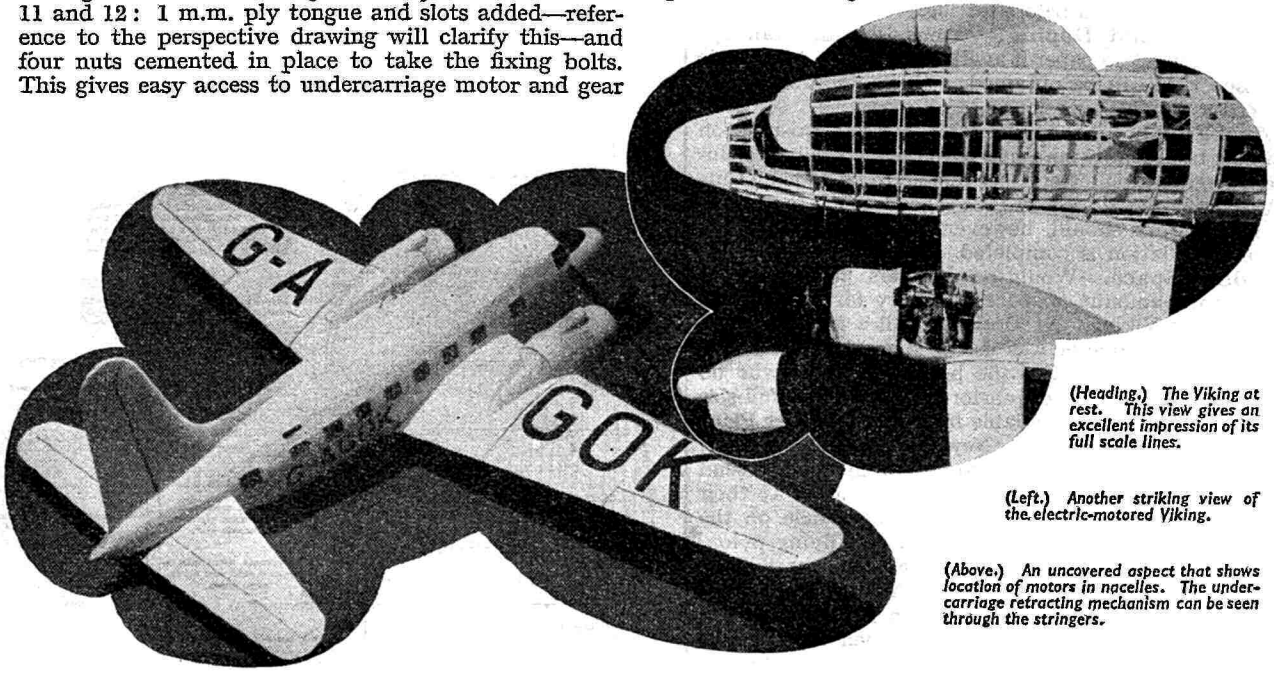
Remove from building board and attach the other half-formers, taking care that they are all at right angles to the backbone. Insert spacing pieces to formers 6, 7 and 8 to take leading edge and mainspars of wings. These should have been cut out and tried for size before commencing assembly of formers. Stringers other than those in the way of the wings should now be added; the soft balsa nose, soft balsa block forming the cabin roof, and the cabin framework may also be fixed. The fuselage is then cut through laterally between formers 11 and 12: 1 m.m. ply tongue and slots added—reference to the perspective drawing will clarify this—and four nuts cemented in place to take the fixing bolts. This gives easy access to undercarriage motor and gear train on motor platform, which can be slid out for inspection.

Wings.—The wings may be built in two halves flat on the building board, each half comprising an outboard panel and its respective half of the centre section and nacelle.

Dowels should be selected and about eight thicknesses of paper 6½ in. long wrapped tightly round them, sticking each layer. Wing ribs should then be drilled to receive these dowels *in their tubes*. Assemble the ribs on the building board with the dowel-holding ribs in place. Add leading and trailing edges and cement in place.

The horizontal nacelle outlines may be laid in place. The upper parts of these, including inspection hatches, may be completed on the board with stringers—but not yet sheet covered. Add wing tips and remove unit from board.

The wings may now be slid through the fuselage from each side and cemented to the formers and special spacers 6, 7 and 8, taking care to line them up accurately. The wing tips should be supported at the correct dihedral angle, while the main spars, which should be pinned to their spacers, are setting.



(Heading.) The Viking at rest. This view gives an excellent impression of its full scale lines.

(Left.) Another striking view of the electric-motored Viking.

(Above.) An uncovered aspect that shows location of motors in nacelles. The undercarriage retracting mechanism can be seen through the stringers.

Dural rod of ¼ in. diameter is next fitted through fuselage to take undercarriage legs and retracting lever. This should be slid on as the rod is pushed through and the locking bolt fixed when in place. Note angle at which it must be secured. Undercarriage spring legs can be added and tested for correct positioning by moving this lever backwards and forwards.

Now the whole wing is complete in outline and attached to the fuselage. The leading edge may be sheeted in and the centre section covered in 1/32 balsa sheet. The lower parts of the nacelles may be completed. Slide a fine razor blade between ribs 5 and 6 and cut through the paper tubes to render the outboard panels detachable.

Tailplane and Fin.—Fin is built as a complete unit before cementing to backbone. Check for alignment. Add ¾ in. balsa block dorsal fairing and sand to shape.

Tailplane presents no difficulty. The tail-tube should be wound on the dowel and fixed in place as indicated. Two pieces of 3/32 balsa sheet are added between formers 15 and 16 against which each tailplane panel will fit snugly.

Sheet Covering.—The fuselage is sheet covered in 1/32 sheet balsa. The large number of stringers render this a comparatively simple job. After the covering is dry, plastic balsa wood should be laid along the junctions of wing centre section and fuselage, and with a wet finger a smooth curved fairing worked in.

Lightly sand nose and rest of the fuselage. Cover with filler and rub down. Carve the block balsa direction finder and cement in place.

Nacelles.—It is not desirable at this stage to complete covering of nacelles as motors have yet to be added. These will be dealt with in the next article. Rings should be made and tried for fit; air intake and other accessories completed.

Airscrews.—Simple four-bladed variable pitch airscrews are employed in which four holes are drilled at right angles through a hardwood spinner, and the blades plugged therein. A small template, as shown on the plan, should be used to ensure similar pitch on all blades, which should be fixed with a slow drying glue so that they can be adjusted before setting.

Covering and Doping.—Wings, fin and tail are covered in bamboo paper if available or in the best grade of tissue that can be obtained. Water spray and give two coats of tightening dope.

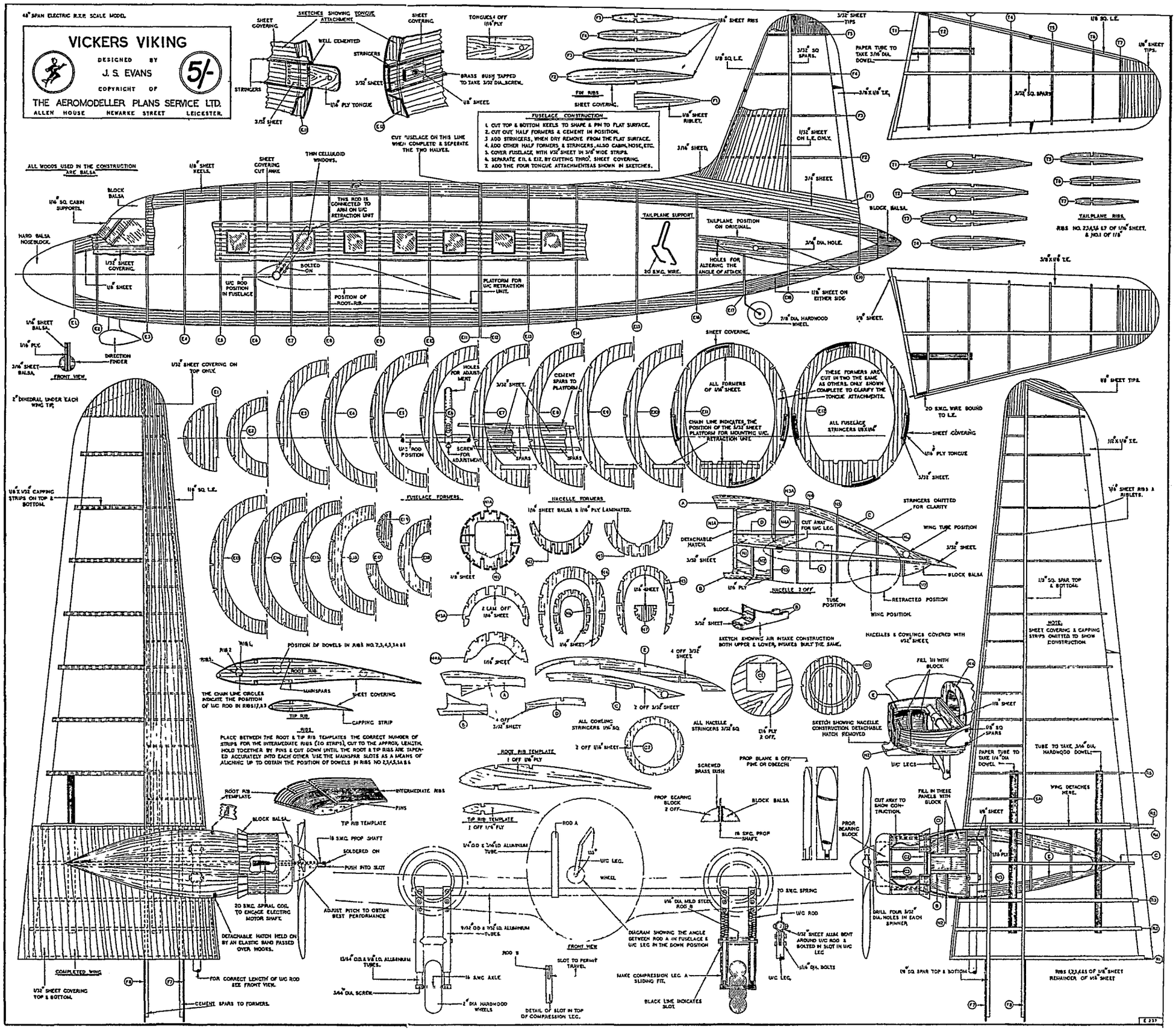
Final Finish.—The model deserves a fine finish which can best be given by spraying with cream or silver cellulose. Registration letters only remain to be added. Cut-out tissue letters doped on give a good effect.

All this work should, however, be deferred until the motor installation is completed.

Flying Space.—Would-be builders may like to consider the amount of space necessary for the efficient flying of the Viking. At Dorland Hall a flying area of 14 ft. outside diameter was used.

Full-size Plans.—For the benefit of those who do not care to scale up the quarter-size drawings, full-size plans 43½ × 38 ins. are available from Aeromodeller Plans Service Ltd., Allen House, Newarke Street, Leicester, price 5/– post free. Readers are recommended to send off for these at once in order to make a start at their models, in anticipation of next month's article on the necessary electric motors, control box and flying pylon.

Prize offer.—A special prize of Two Guineas will be paid for the best photograph of a Viking, built from these plans, **in flight,** received by the 30th September, 1946. By running a lead into the garden it should be possible to get good action shots on the lawn.



C I V I L A I R C R A F T N O . 3 0

THE PERCIVAL PROCTOR V

BY E. J. RIDING

A.T.P. Photographs.

QUICK to realise the possibilities of the four-seater private or charter aeroplane both at home and abroad, Percival Aircraft Ltd., now one of the Hunting Group of firms, have produced the Proctor V, which is actually the civil version of the Proctor IV, the only differences being in the seating arrangements and the removal of all military equipment.

The Standard version carries four people, including the pilot, with fuel for four hours' flying; the Long Range version carries pilot and two passengers, but the increased weight of fuel gives a duration of six hours. The Short Range version has the rear seats removed in order to accommodate 645 lbs. of baggage, and with a crew of two the duration is two hours.

Construction.

As in the previous models, wooden construction is employed throughout and great use is made of improved plastic cements in order to withstand varying conditions of climate. The fuselage is of normal ply covered box pattern with four spruce longerons and curved plywood decking. The wings, reminiscent of their ancestor the Hendy 302, have two wooden main spars braced with diagonal cross members and are fabric covered, as are the fin, rudder and elevators.

Power is supplied by a 208 h.p. six-cylinder in-line air-cooled D.H. "Gipsy VI" engine driving a D.H. constant speed airscrew.

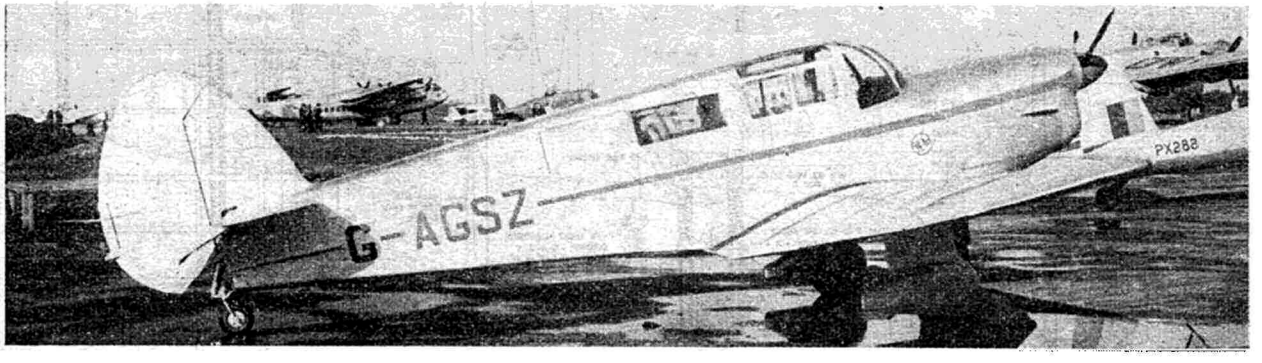
The production of Proctor V's from the Luton factory is on the average three or four per week, a large proportion being for overseas markets.

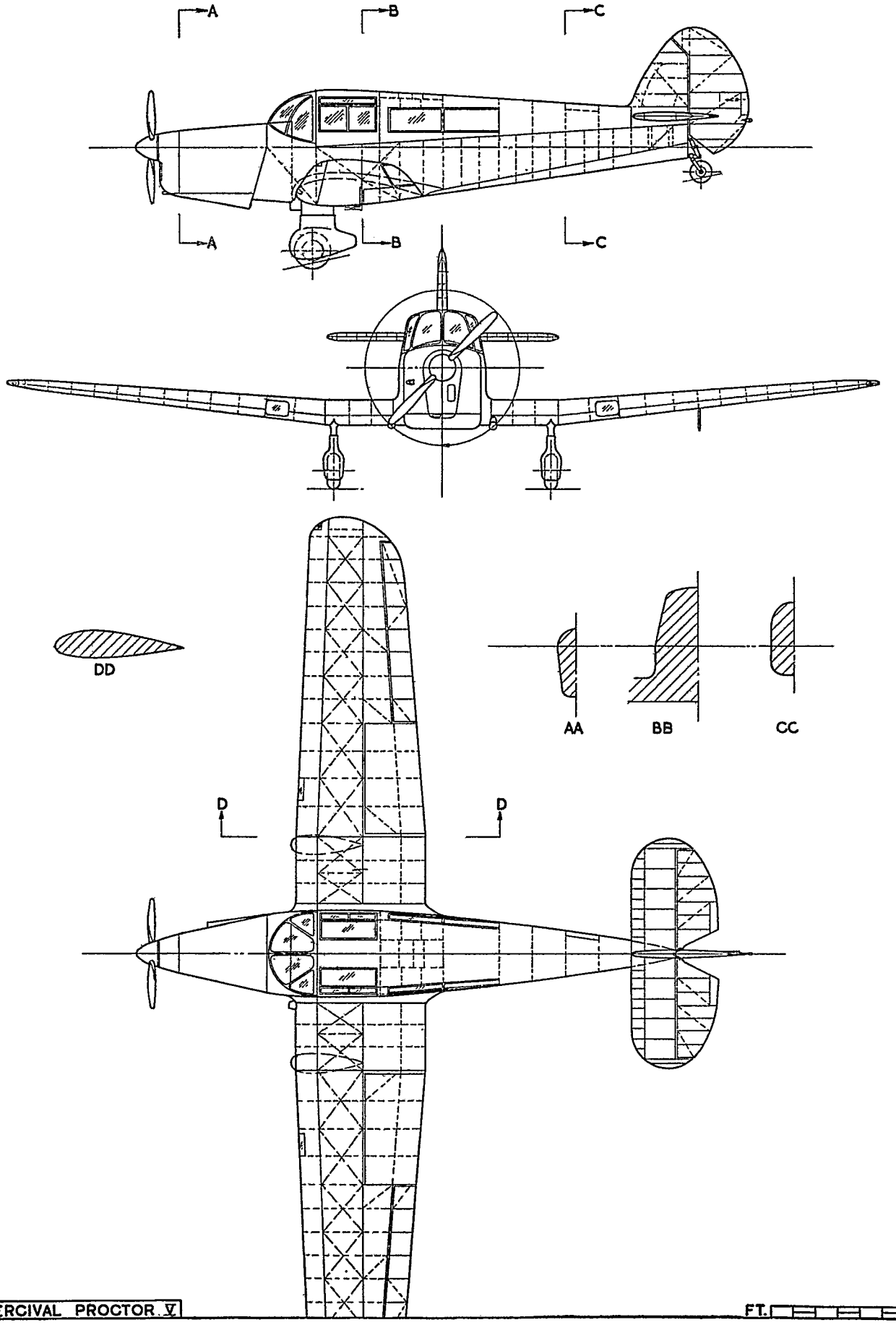
Colouring.

The machines in the accompanying photographs were finished in the following colour schemes: G-AGSZ, (Hunting Air Travel Ltd.), was aluminium all over with a crimson centre line down the fuselage and crimson registration letters on the fuselage and wings.

G-AGTC, one of the Percival demonstration machines, has a turquoise blue fuselage and registration letters on the wings, aluminium coloured wings, tailplane and undercarriage, and silver letters outlined in dark blue on the fuselage. One of the export machines, OO-CCE, has a silver fuselage, rudder and fin, undercarriage and letters on the wing, whilst the wings, tailplane, centre line and registration letters on the fuselage are red.

Specification (Standard version): Length, 28 ft. 2 ins.; span, 39 ft. 6 ins.; height, 7 ft. 6 ins.; wing area, 202 sq. ft.; span (folded), 16 ft. 4 ins.; weight (empty), 2,340 lbs., (loaded), 3,500 lbs.; max. speed, 157 m.p.h.; cruising speed, 135 m.p.h.; landing speed, 55 m.p.h. Range, 500 miles; consumption, 10 gallons per hour; service ceiling, 14,000 ft. Price £2,900.





PERCIVAL PROCTOR V

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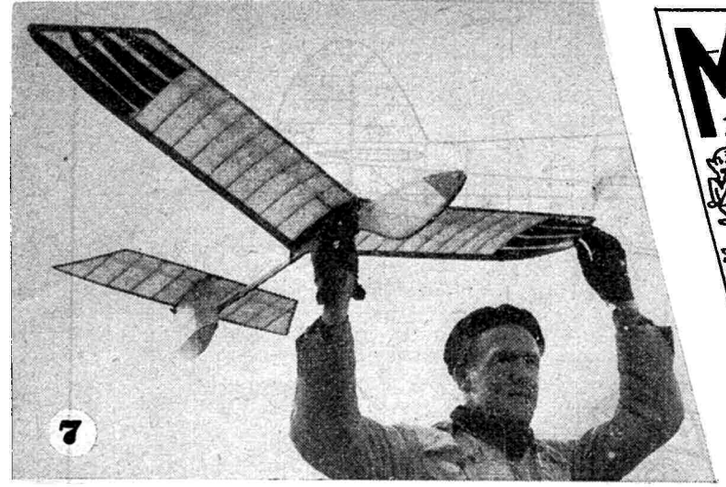
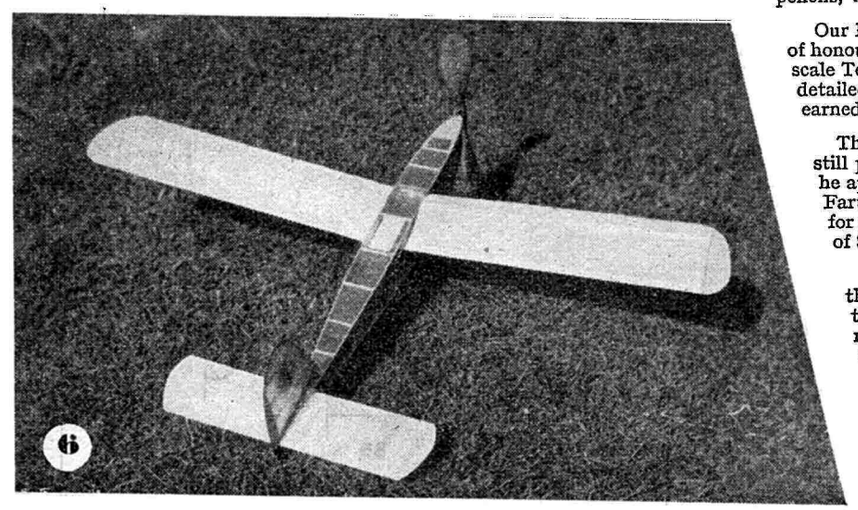




MODEL NEWS

SUMMER is here, and Fliar Phil, reclining amidst the scent of May flowers after a hard day's flying at Eaton Bray, wakes up reluctantly and gets his pencil out to ponder the photos he has been sent in response to his anguished plea for help last month. Quite a number of good snaps have rolled in, but still more are needed. Get out those cameras for the fine weather is here again, and films, if you haven't already found out, *are* getting back to the shops. Get out your pencils, too, and give me my *newsy* photos and plenty of gen besides.

Our Model of the Month in Photo 1 won kudos for its constructor before it reached its place of honour in Model News. Built by Geoffrey Parry, of Mundesley, Norfolk, this delightful 1/48th scale Tempest took first prize in its class in the A.B.A. National Competitions last year. A fully detailed cockpit and excellent finish are just two of the points which gained this model its well-earned laurels.

The lightweight movement has found much support lately and although Fliar Phil himself still prefers something a little more solid so he doesn't need to hold his breath when handling, he appreciates there is a lot to be said for it if it is duration you are after. Duration being Mick Farthing's middle name, it is no wonder that his famous lightweight design has been responsible for more lost models than almost any other. The example in Photo 2 was built by D. R. Seaward of Stockton and D.M.A.C., and a very creditable effort it is too.

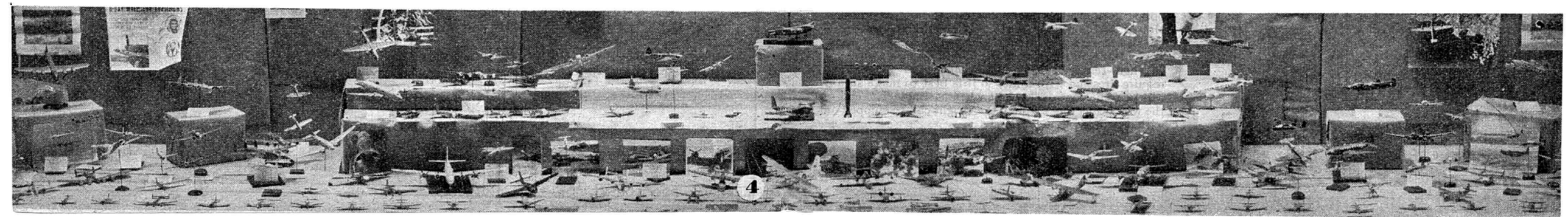
It is good to see that quite a few readers are beginning to realise the advantages of having their models professionally photographed. After all, it is only fair to a good model to make sure that a photo does it justice, and unless an amateur has considerable experience he rarely takes a really good photo. Photo 3 is an excellent shot of Stirling and Mosquito solids as built by A. C. Sayers, of Southgate, which demonstrates the benefits of good photography.

A nice little show, isn't it, Photo 4? There are one hundred and sixty-five different models on view, which would be a pretty good effort for any club. Only—it wasn't a club that produced this collection—it was *one* chap, C. W. Moss, of Reading, and he is still adding to it. The total of one hundred and sixty-five comprises British, American and German types, all built from AEROMODELLER and A.F.P. plans. Mr. Moss only started making models when the system of works air raid spotters was introduced during the war, and is to be congratulated on his rate of production! He agrees with Fliar Phil that there is no better way of learning aircraft recognition.

At last year's Hamley Trophy we remember a careless spectator suffering some unpleasant minor injuries due to the peculiar antics of a petrol model on a test flight before the contest. The Go-chase-'em Gremlin, however, is not confined to Britain, as Photo 5 demonstrates. The photo was taken at a National Model Meet at Akron, U.S.A., well-known location of many big flying meetings. The model's "Stuka" antics seem to have alarmed the majority of spectators, who are trekking hastily. Wonder if they have an N.G.A. scheme in America?

Our old friend and correspondent, that well-known Danish aeromodeller Per Weishaupt, gives us an idea of the kind of "modern" model favoured in many continental circles with Photo 7. This sailplane, built by Henning Jönsson, is a good example of the peculiarities dear to continental aeromodellers, featuring a swept forward wing and an ultra-thick section fin. Unfortunately, most of these unorthodox ideas have no sound aerodynamical basis; indeed, those on the model illustrated must have an adverse rather than a beneficial effect! There is still much room on the Continent for knowledge of low speed aerodynamics, in which field Britain certainly leads the world.

Until next month Fliar Phil bids his fellow reprobates "Wizard Prangs!" and exhorts once again with his battle cry—"*Newsy* Photos!"



CONSTRUCTIONAL NOTES

BY R · S · WELFORD

THE following is a selection of "wheezes" and "swindles" which have proved useful to me from time to time as a duration modeller. I think other modellers may find them of use also and I accordingly pass them on for their benefit.

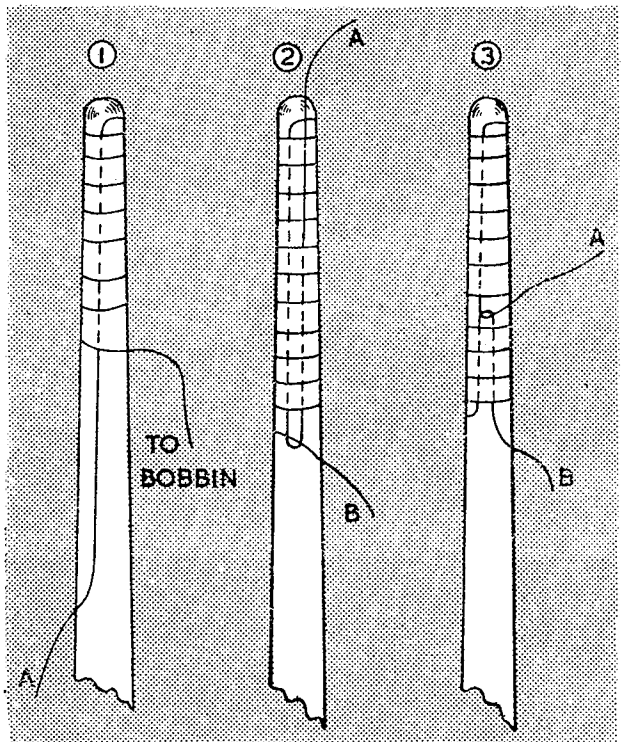
Bushing Nose Blocks and Spinners.

This is one of the most difficult constructional snags which the average duration model builder meets with. To drill either a spinner or a nose block dead true to take the shaft bush is not at all easy unless some form of drilling jig is utilised. But the difficulty can be got round—and here's how it's done.

The dodge lies in the fact that the nose block or spinner must be constructed by laminations of balsa sheet cut roughly to the size required and each lamination is drilled to take the bush *before* the layers are stuck together. The laminations are then cemented together and the bush (not a screwed one) inserted. Whilst the cement is liquid it is easily possible to adjust the laminations in relations to each other until the bush is dead truly placed. A length of snug-fitting wire in the bush and a set square may be used as guides, but I find that I can get very accurate results setting by eye alone.

When the cement is well and truly set, the nose block or spinner is carved as required.

Be careful if using a length of wire as a guide. Very loosely-fitting wire will probably lead you very badly astray in your setting of the bush. Take care that it is an accurate fit before relying upon it as a guide.



THREE STAGES IN BINDING AN UNDER-CARRIAGE LEG.

Bindings.

One occasionally needs to bind certain parts of a model with a thread binding, either by way of first construction or else as a repair. To mention one instance, the wheel axles of duration models are nearly always attached to the undercarriage legs by this means. Not many modellers seem to be aware how to finish off these bindings neatly and most are generally content to secure the loose ends with an unsightly knot. It is just as easy to make a neat job, which can be done as follows :—

Commence the binding near the end of the thread; about 4 or 5 in. from it, to be exact. Lay this end down the undercarriage leg and place layers of binding neatly over it until the binding is the length you require. (See 1 in diagram.) Incidentally, the diagrams are "exploded" drawings, from which the wheeled axle has been omitted for the sake of clarity.

To finish off, double the end A back over the binding thus forming a loop (Fig. 2) and bind a few more turns over this loop as shown. Sever your thread from the bobbin on which it is wound. Insert this new end into the loop and then by pulling on the end A the new end B will be drawn under the last few turns of the binding until the bight of it appears as a tiny loop where the end A projects (Fig. 3).

By inserting a needle in this loop, the end B can now be pulled completely through. It, and the end A, are then cut off flush with the surface of the binding and you have a neat result, neither the beginning nor the ending of which can be seen.

Balance Weights for Folding Propellers.

My usual method of making balance weights consists of wrapping sheet lead neatly round the balance weight wire and then soldering the lead to the shaft. But on one or two occasions I have not had sheet lead on hand, so have had to cast the weight in a plaster of paris mould. On the last occasion I attempted this, I found that my stock of plaster of paris was exhausted but, after a little thought, devised the following "ersatz" method of getting over my difficulty.

A slice is cut off one side of an ordinary, common or garden potato. This is to enable it to stand firmly and without moving when laid on the table or bench. A section is removed from the other side with an apple corer as used in the kitchen; or a piece of tube of smaller diameter can replace the corer if only a small weight is required. The mould is now completed.

The balance wire is tinned with solder and is placed centrally in the hole. It is forced sufficiently into the potato forming the mould bottom to hold it upright. Molten lead is next poured in *slowly* until the weight is the size required. You *must* go slowly with the pouring, as the lead will boil out of the mould if you do not.

When removed from the mould, the weight will require dressing with a file, so it is best to make sure it will be somewhat overweight when casting. The end of the wire projecting through the weight can be snipped off with a pair of pliers.

Repairing Torn Tissue Covering.

Those slits which often are the penalty to be paid for

a day's flying can be easily and neatly repaired as follows.

Manoeuvre the edges of the slit as closely together as possible, then apply balsa cement liberally along their length. The idea is that when the cement dries it will form a skin over the slit in the tissue, so the cement has to be liberally applied. You will find that this makes a splendid repair and that owing to the contractive effect of the cement the covering in the neighbourhood of the slit, which will probably have slackened to some extent, will be pulled taut again.

If your model is silver tissue covered you need do nothing further than the above to make a permanent and unobtrusive repair. The same applies for all other light covered coverings, but for dark colours you will need to apply a small and neat patch of tissue to hide the cement. Wait until the latter is dry before applying the patch.

One great advantage of this repair method is that it can so easily be used on the flying field itself.

For further "field" repairs a packet of cigarette paper serves as an excellent tissue repair pack.

Bushes.

It is still rather difficult to obtain brass tube to form bushes for wheel axles to work in, propeller hinges, nose blocks, etc., and the following substitute methods of forming bushes may be of help to modellers.

The first is to form the bush by bending sheet tin round a piece of wire of the same diameter as the shaft or axle you intend to use. To do so, place one edge of a strip of tin on the wire and grip with pliers. Bend the sheet round the wire until it overlaps the first end, mark, and cut off the surplus with tin snips. When doing this, you will probably have to remove the bush from the wire and open it out slightly. Replace on the wire, manipulate with the pliers until both edges of the bush meet, and solder along the join. If the bush is intended for a nose block, it should be completed by soldering a small brass nut on it at one end, to act as a thrust boss.

An even easier method is to use stiffish brass wire of small diameter. This is cleaned well with emery cloth or sandpaper and then wrapped carefully round a length of wire of the right diameter. The brass wire is then liberally tinned with solder and a strong bush results.

When using this last method, two precautions are necessary. The first is, that care must be taken to see that the coils of brass wire are all in contact with each other, otherwise a weak spot will be present in the finished bush at any gap. The second is that the wire "former" should be slightly greased to prevent it and the bush soldering up solidly together.

An even simpler way of getting over the bush difficulty but which is only practicable for light models, such as round-the-pole types, is to cut two small squares of tin or aluminium sheet, drill to take the propeller shaft or wheel axle and then turn up all four corners of each piece to form spikes which can be embedded in the balsa of the nose block or wheel, as the case may be. For a nose block, one piece is applied to the front of it and the other to the rear. For wheels, the pieces go at either side.

Yet another method of making bushes is to place an ordinary brass screw in the vice, file off the slotted head, and drill through the centre.

All the foregoing methods have been utilised by myself on various duration models from time to time to form bushes for wheels, nose blocks, folding propeller hinges and spinners or for hinges for retracting undercarriages. All are satisfactory if constructed carefully.

Just Out!

The NEW MAGAZINE for the Model Engineer

Do your model interests go beyond model aircraft? If so you should read this new magazine regularly. The first issue gives you 40 pages size 9¾×7½ ins., with articles on RACE CARS, LOCOS, PETROL ENGINES, YACHTS, POWER BOATS, and TURNING and FITTING. There are helpful illustrations from photos; many detailed drawings; and a Plan Service of full size working plans at a moderate cost. No. 1 is out—but there is a limited quantity; so get your copy today! Give a regular order to your newsagent; better still, take out a year's subscription — it is only 18/6.

The MODEL MECHANIC

1/3 MONTHLY

Published by the Proprietors: The Drysdale Press, Ltd., Edward Buildings, Rutland Street, Leicester.

THE LOW SPEED AERODYNAMICS RESEARCH ASSOCIATION REPORT NO. 7

GLIDE TESTS ON TYPICAL MODELS

INTRODUCED BY AN APPEAL TO AEROMODELLERS. BY N · K · WALKER, B.Sc., DIRECTOR OF RESEARCH TO THE L.S.A.R.A., AND AUTHOR OF THE REPORT

MOST people who talk to me about research work seem to think that it is all very difficult, and that you have to be a mathematical genius to produce any really new ideas. This is quite untrue, and to show how very important results can be obtained from simple tests L.S.A.R.A. Report No. 7 was selected as the first to be published in the pages of the AEROMODELLER. The results given in the report are admittedly rough but they are so important that they have upset all the accepted ways of estimating the performance of a streamlined glider.

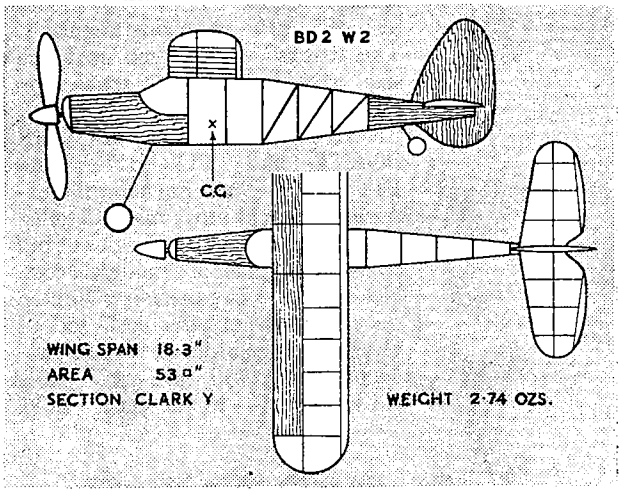
Before we can produce a really good up-to-date theory of design procedure to replace the old one, now shown to be inadequate, scores, or even hundreds, of tests on all kinds of models must be made, and the results collected and analysed. The membership of the L.S.A.R.A. is to some extent lop-sided as we have a very good number of members who can do the collecting and analysing, but in comparison, an inadequate number of members to do the very important work of modifying or building models and testing them. I feel sure that the reason is that the average modeller, who is the sort of person best suited for the job, has not realised how much he can help, and I hope that this short chat will have cleared the air.

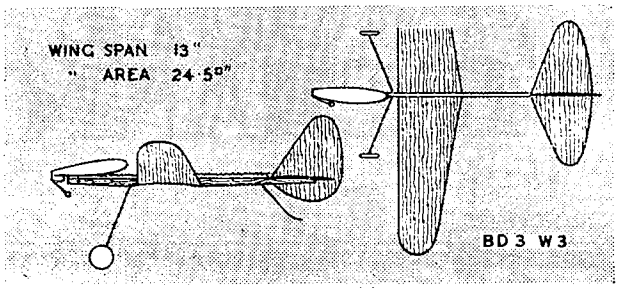
Modellers overseas are flocking to the standard of research, and many groups of overseas members are setting up foreign centres which are to co-operate with the main body in research work. Applications have been received from various European countries, and the U.S.A., but the first established centre is in Palestine under Dr. Fidia Piatelli, Dr. Aer. Eng., Dr. Ind. Eng., who is coming here shortly to discuss programmes.

Various regional centres are to be set up in Great Britain where local members can co-operate in research work. It is hoped to provide each centre with a wind tunnel and work-shop facilities, whilst individual centres will have specialised equipment applicable to the particular branch of research with which it is concerned. The first one to be set up will be in East London and will be particularly concerned with the flight testing of models, though other work of a general nature will also be undertaken. Interested persons should contact D. S. Chandler, Esq., 35, Little Gaynes Lane, Upminster, Essex. Other centres will be Hatfield and St. Albans, for engine work; Manchester for wind tunnels and flight testing.

There is a tremendous amount to be done, and I appeal to any model builder who feels capable of neat and fairly accurate workmanship to join the L.S.A.R.A. (subs. 10s. 6d. per annum) and assist us by building models for test, testing his own models by our new procedure and by modifying his own models for test. There are also considerable opportunities for solid model builders, as models of all sizes are required for testing in the various wind tunnels operated by the Association. Materials for approved models will be supplied by the L.S.A.R.A.

Full details may be obtained on request from N. K Walker, Esq., 9, Alexandra Road, Farnborough, Hants.





• REPORT NO. 7 •

BY N · K · WALKER, B.Sc.

Summary.

Advance results of glide testing on various models with conventional wing sections are given, these being sufficient to "debunk" the often-heard exaggerations of "glides of 1 to 19 without thermals on a calm evening." Several well-known types are covered, and the relative efficiency is a helpful guide to type design.

Introduction.

An aspect of model flight on which there is much controversy is the gliding angle. If we are to believe our American friends, gliding angles of 15 to 1 are common. I find this unbelievable since the average figure for a full-scale sailplane is only 24 to 1. On the other hand, quite well-known modellers will solemnly affirm that their new bus does 12 to 1 and that they "measured" the glide. In practice, this measurement usually consists of gliding the model from shoulder height and seeing how far it glides before touching down, the gliding ratio being given by the ratio of the distance flown to the height from which it was launched. Of course, the best result is taken; this is where the trouble starts since it is quite possible to launch a large model a little too fast and it will then glide much flatter than the true gliding angle. In free flight this would normally produce a gentle stall, but with the short glide possible from a hand launch this does not have time to show itself.

In addition, there is a considerable interference from the ground when the model is less than two chords above it, which greatly reduces the induced drag and increases the lift. One model gave a gliding angle of 11½ to 1 from shoulder height, but when launched from a hilltop the glide was found to be only 7½ to 1.

The other common way of " guesstimating " gliding angles is to estimate the angle of the fuselage to the horizontal when the model is gliding. This is obviously prone to optimism and also the model may easily be gliding with its nose up or down several degrees. For instance, I have seen a " Korda " gliding down with its nose up two degrees, so by this method it should be rising !

Experimental technique.

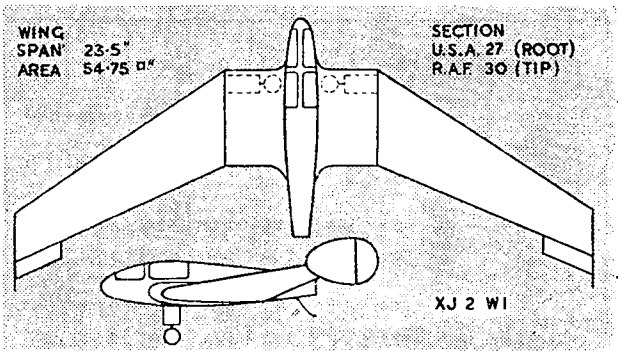
I have found the best way of measuring gliding angles is as follows. Find a piece of open ground which rises steeply to one side. The slope should be about 1 in 6 or 1 in 7, so that if you climb to the top and hand launch a model it will glide for about 60 to 100 feet, and any faults in the launch will show up. Take a semi-circular celluloid protractor, preferably a large one, and drill a fine hole in the centre. Pass a long hair through it, and stick the end down to the back of the protractor with a dab of cement. Attach a small lead weight to the other end. The hair and the weight now form a plumb line and if, after launching the model, you sight along the straight edge of the protractor to the point where the model struck the ground, the angle between the hairline and the 90° line will be equal to the gliding angle. (It is advisable to get a friend to read the protractor while you hold it steady and to take several readings, discarding those which are in bad agreement (error of ½ degree or more).)

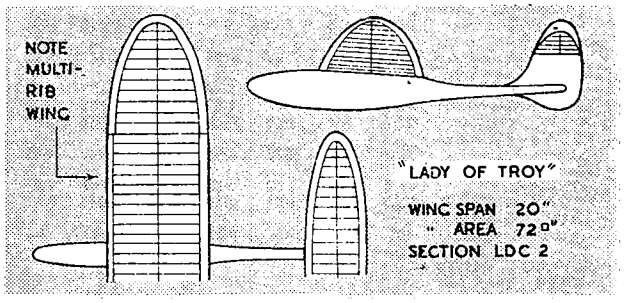
There is more to it than this, however. It is essential that three conditions be satisfied for gliding angle measurements for reasonable accuracy to be obtained.

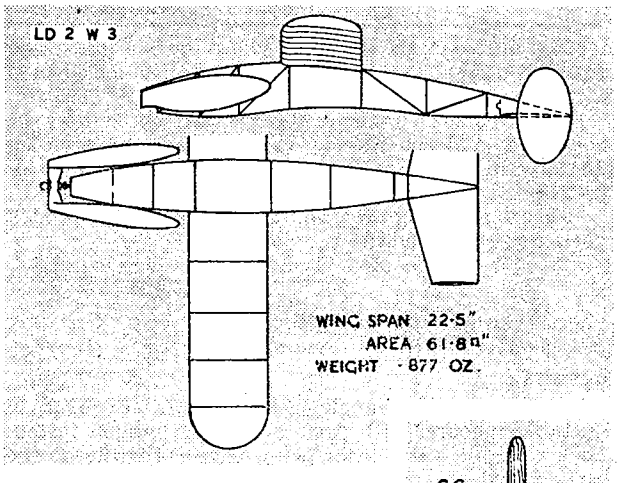
1. There must be no wind.
2. Thermals and rising currents must not be present. Here, cool, damp, foggy weather is best, and winter is the best season.
3. The model must fly straight. If it flies in a curve the glide measured will be too steep.

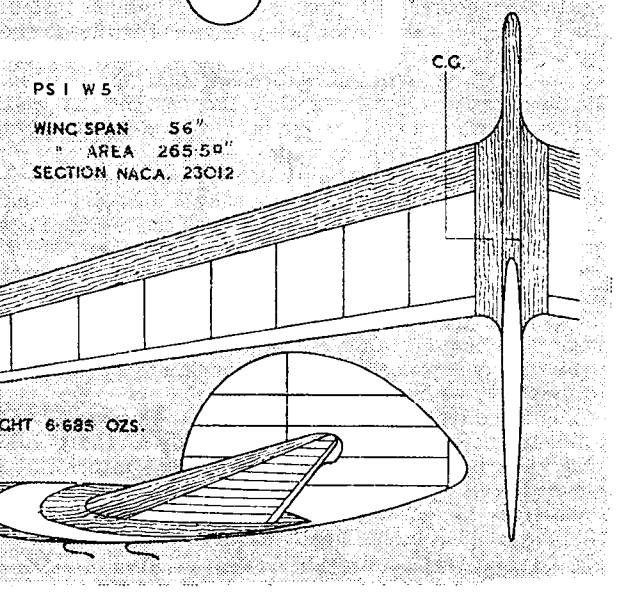
Measurements of lift and drag coefficients.

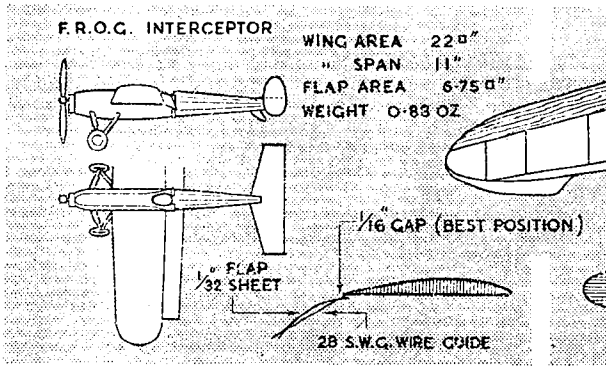
For this a stop-watch should be used to time the flight. By pacing out, measure the distance the model flies (for this measurement the model can fly in a curve as long as you follow its track accurately). The method sounds very rough, but provided you take smallish paces it is quite easy to keep them uniform, and to check the length of your pace by measuring the distance











MODEL	V Ft./ Sec.	L/D	Vs Ft./ Sec.	C_L	C_D	C_p	$\frac{C_L^{1.5}}{C_D}$
BD_2W_2	16·7	4·1	4·1	1·40	0·343	0·244	4·85
BD_3W_3 (Aeromodeller, Jan., 1943)	12·7	5·4	2·35	1·21	0·224	0·151	5·95
LD_2W_3 (Aeromodeller, Sept., 1943) with no prop or undercarriage	9·2	5·2	1·77	1·28	0·246	0·173	5·90
LD_2W_3 with folded prop ...	9·2	4·85	1·90	1·28	0·264	0·191	5·50
FROG Interceptor with large tail	18·6	6·1	3·05	0·85	0·139	0·100	5·6
FROG as above plus Fowler flaps	13·5	5·0	2·70	1·64	0·328	0·185	6·4
AIRACOBRA (Astral kit) with freewheel prop...	25·0	5·0	5·00	0·73	0·146	0·118	4·3
Ha138 flying boat no props, no floats	22·5	5·6	4·02	1·05	0·191	0·149	5·75
Ha132 less trim weight	18·5	5·3	3·50	1·44	0·272	0·187	6·35
Ha138 with props	16·9	4·1	4·12	1·67	0·407	0·308	5·3
XJ_2W_1 (tailless)	21·6	6·0	3·60	0·42	0·072	0·064	3·9
PS_1W_2 (tailless) glider	22·2	7·6	2·95	0·41	0·054	0·049	4·85
20 MINUTE GLIDER	17·6	10·5	1·68	0·50	0·048	0·041	7·4
IVORY GULL II	22·0	11·5	1·91	0·55	0·048	0·040	8·5
LADY OF TROY (aerofoil LDC2)	12 (app.)	11–12	1·0 (app.)	0·80	0·067–0·073	0·031–0·037	10–11
FLYING SUITCASE (aerofoil LDC2)	14 (app.)	13–15	1·0 (app.)	0·75	0·050–0·058	0·025–0·033	11–13

covered in five or six steps. If you possess a measuring tape this may be used to determine the distance covered with even greater accuracy.

From this measurement the forward speed may be calculated, and the sinking speed is given by dividing the forward speed by the L/D ratio (distance glided ÷ vertical height at launch).

Measure the wing area and the weight of the model. Then the lift coefficient is equal to

$$C_L = 52{\cdot}6 \frac{\text{(Wing loading) (ozs./sq. ft.)}}{V^2}$$

where V equals the flying speed in ft./sec. The drag coefficient is found by dividing C_L by the L/D ratio.

Results.

Results of gliding angle measurements are given in the table, together with particulars of the models tested. They were all tested after being trimmed to fly at the incidence which appeared to give the best glide, though no special tests were made to check that this was so. In most cases it appeared that the best results were obtained with the C.G. as far back as possible without causing a nose light, jerky glide.

The results show that lightly-loaded slab-sided models have a much greater drag than a streamlined glider, but that they fly at much higher lift coefficients and their final sinking speed is likely to be of the same order. This may explain why the slab-sided model has held its ground against the streamliner in competition work for so long. It is obvious that theoretical and practical work on dynamic stability is urgently required in order to find a way in which streamline models may be designed to fly stably at high lift coefficients.

The advantage of the new L.S.A.R.A. sections is well brought out and it seems that not only is the profile drag lower but that the practise of using a rather more forward C.G. position, or some property of the sections themselves, has allowed the models using these sections to fly at a much higher lift coefficient.

An article on these revolutionary L.S.A.R.A. aerofoil sections will be published in a forthcoming issue.—[Ed.]

Readers Letters continued.

The reason I'm writing to you is this. I've raced through your February and March issues of this year, and, I'm afraid, any amount of them is Greek to me. Even the ads.

The die-cast things that go on ash-trays don't fly, I suppose. Or do they? There's a rather lovely Superfortress model pictured in the February number. Will that stay in the air? I mean, for an utterly innocent beginner such as I am, is there any way of distinguishing between the thing that stays put and the thing that moves?

Again, is there a difference between a sailplane and a glider? I actually know what a glider is—I succeeded in wrecking, or, rather, assisting at the wrecking of two yesterday. And what's the difference between wing-span and "chord"? Then, a number of models are labelled "duration"—has the term any technical significance? Is a "solid" model one that won't fly?

Perhaps, if I say what I'd like to do, my difficulties would be more easy to deal with. First, I want to build a GLIDER. Second, a glider that'll stay up for twenty, thirty seconds or so. Third, a glider that can be THROWN UP . . . and, having achieved all that, a glider that can be TOWED UP.

Now, I'm fairly sure that almost every month finds absolute beginners like me reading your magazine for the first time. And I do think it'd help if you had some kind of glossary or list of the elementary technical words and phrases which are used in your articles and ads.

J. H. Maxwell, for example, had a most interesting article on CHUCK GLIDER DESIGN in your March issue. My list of "difficult" words from that would be the following—lift, drag, chord, cambered, filleted, fuselage, formula restrictions, low lift aerofoil sections, angles of attack, rigged at zero degrees of incidence, longitudinal dihedral, no lift angle, chord line, longitudinal stability, swept back, dihedral angle, semi-span weight drag ratio, ft. oz. (I know that this literally means "foot ounce"—but what on earth is a foot-ounce?). I daresay these terms and phrases are child's play to any amount of children, but I must confess that I find them rather confusing.

From VAPOUR in the same issue I pick these—soarer sailplane, free flight, flying-boats, float planes, undercamber, battens, leading edge, trailing edge, high aspect ratio, central chord, dethermalizers, thermal hunting, slope soaring.

Another thing that'd help a lot would be a sort of beginner's guide, that is, a rough classification of the main divisions of models; say, into those that get up and those that are permanently grounded; then, in the get up group, the propeller crowd and the propeller-less; in the propeller crowd, the rubber, the petrol, the electric (or are there any?), and so on. I'm pretty certain this classification of mine is faulty, because I am just guessing that these differences are sufficient bases of division.

Anyway, I'm sure you've some idea now of the difficulties I have in mind, and I know you'll be able to think of some way of helping not merely me but all those others who become suddenly aware that this modelling-and-flying business is extremely fascinating and an activity out of which one could get lots of fun—if only there was some reasonably easy way of getting to know the language.

Eire. BROTHER FRANCIS.

We publish the above letter so that all of us who have been aeromodelling for some time can appreciate the vast problem, including the "language difficulty," that confronts the beginner. Brother Francis presents his aspect of this problem in a charming and witty fashion as only an Irishman can.

We have answered his questions, and references to appropriate textbooks have been given. There is for instance a complete glossary of Model Aeronautical terms in "An A.B.C. of Model Aeroplane Construction" by C. S. Rushbrooke, an ideal book for the beginner.

Club instructors, and contributors who send us MSS. for beginners, should take note of the above letter which will serve as an excellent guide.

Welcome to Aeromodelling, Brother Francis! It is a fascinating hobby, and you do get lots of fun.—[ED.]

Readers' . . . . . Letters

The Editor does not hold himself responsible for the views expressed by correspondents. The names and addresses of the writers, not necessary for publication, must in all cases accompany letters.

DEAR SIR,

I write as one with little experience of miniature Diesel engines, but I am very interested in their potentialities as applied to model aircraft.

Mr. Hunt's article in the current issue of AEROMODELLER is full of interest and provides a useful basis for future research for a suitable fuel.

As far as a suitable standard fuel for thermal efficiency tests is concerned, all that is necessary is a fuel of known calorific value because the thermal efficiency is equal to

$$\frac{\text{Heat converted into work}}{\text{Heat available.}} \times 100 \text{ per cent.}$$

If a fuel is fixed as standard, all other mixtures can be tested under the same conditions and determined as better or worse; the standard fuel need not be the best, although it must obviously be usable.

The aim of these researches is to find a fuel mixture which does not detonate under the high pressures attained and which does not suffer from pre-ignition. Detonation occurs when the self-ignition temperature of the mixture is exceeded and may be avoided by:

(*a*) Reducing the rate of burning of the mixture;
(*b*) Increasing the self-ignition temperature of the mixture.

Since the engine depends on (*b*) for its ignition, it would appear that the proportion of accelerator (ether) should be reduced to a minimum and that the remainder of the fuel should be composed of high octane fuel. In general the ethers are prone to pre-ignition and it may prove possible to substitute a large proportion of it by some other liquid of low flash point, *e.g.*, acetone, ethyl or methyl acetates. Thus the *modus operandi* would be, ether ignites acetone which ignites the bulk of the fuel. The sickly odour of the exhaust fumes may be due to an excess of ether being present? It might be a good plan to take several mixtures (petrol/oil, toluene/oil, benzene/alcohol/oil, petrol/acetone/oil) and to determine the amount of ether necessary for each in order to get satisfactory starting and running.

The cool running of these diesel engines may be attributable in part to the large degree of expansion which the waste gas undergoes before being exhausted.

I disagree with Mr. Hunt's contention that cyclic compounds detonate more easily than do the aliphatics: benzene, toluene and xylene all withstand higher compression pressures than do hexane, heptane and octane—the principal components of petrol.

In addition, it would be instructive to determine the effect of the additions of very small amounts of lead tetra-ethyl, since this material restricts the branched chain mechanism (chemically speaking) characteristic of detonation and it does not raise the self-ignition temperature much.

Bournemouth. M. J. F. TURNER.

All the substances listed above, which were omitted from the article owing to shortage of space, were tried by Mr. Hunt in the course of his experiments, and the final outcome was that ether was the real "prime mover."—[ED.]

DEAR SIR,

The two letters on petrol models, one in the January issue by Mr. Banks on competitions, the other in the February issue by P. Bainbridge on the shape of the same, prompt me to write and state my views, and as a petrol-modeller give an answer to P. Bainbridge's outspoken letter.

The nomination type of contest was all right in the late 1930's when it tended to produce a stable and reliable type of model. But in 1945, when a Super Bucaneer, which is an American model designed way back in 1937 (I think) wins the Bowden International Trophy, then there is indeed something wrong with the rules. I would therefore suggest the following two types of competitions:

1. *Duration Competition.*
   (*a*) Open to any type of petrol model.
   (*b*) Each entrant to make three flights with a motor run not to exceed 20 secs., the highest aggregate of three to win.
   (*c*) Fuselage cross-sectional area to comply with S.M.A.E. formula, *i.e.* $\frac{(\text{overall length})^2}{100}$
   (*d*) Wing loading to be not less than 10 oz. per sq. ft. and not more than 16 oz. per sq. ft.
   (*e*) No motor to exceed 12 c.c.
   (*f*) For every 1 c.c. of engine capacity model must weigh 9 oz. "all-up weight," *i.e.* a model with a 3 c.c. motor must weigh 27 oz. all-up.

It is this last rule that would make this type of competition a success. In American competitions it is usually the modeller who can put the largest engine into the smallest model and keep it there without the whole contraption folding up who wins. But if we have a limited power to weight ratio we would do away with this rocketing climb under terrific torque, which can only be controlled by mounting the wing on a pylon with a large amount of dihedral. Instead of all this designers would have to make use of streamlining to the full with retractable undercarts, etc. This type of competition would bring the most efficient type of aerodynamic design to the top.

2. *Scale Model Competition.*
   (*a*) Open to petrol models built to any scale.
   (*b*) Three flights between 40 and 80 secs., 100 points for each flight.
   (*c*) Forty points for each flight for take off, climb, and glide.

If these two types of competition were organised in this country I have little doubt that we would find a great improvement in petrol models.

As regards P. Bainbridge's letter: the uninspiring shape of so many petrol models is largely due to the type of competition held before the war (with which I have already dealt). While I agree that the shape of the box fuselage is not pleasing to look at, it is, however, easier to rig up one's wiring in it, also a planked fuselage, while being pleasing to the eye, is expensive—in weight to a small model—in £ s. d. to a large one.

I must say that I thoroughly agree over his remarks re wing sections, but there seems very little to choose between tapered and constant chord wings as far as efficiency on the flying field goes. Though I must admit I do favour the elliptical wing with a thin wing section and light wing loading.

I have found that knock-out engine mounts are not all they are cracked up to be, and do not always save props, as I have seen the Doctor break one!

I have, however, been using folding props on the Ohlsson 23 (4 cc.) with great success so far. They will only break if the model comes in under power, and in that case something is sure to break! I hope this year to develop a 14-in. prop for the Ohlsson 60 (10 cc.) which will stand up to the revs. of the larger motor.

I hope that these suggestions will be of assistance to those who may be organising petrol model competitions.

London. CAPT. J. B. BELLEW.

DEAR SIR,

I'm absolutely new to all this model-building-and-flying business. But yesterday a youngster here communicated something of his own enthusiasm to me and I'm eager to know a whole lot more.

Continued on previous page.

Off to a Flying Start . . .

INTERNATIONAL CONTESTS

PETROL MODELS

WAKEFIELD MODELS

NATIONAL ELIMINATING CONTESTS will be held at Eaton Bray Model Sportsdrome, Billington Road, Stanbridge, Nr. Leighton Buzzard, Beds., on Sunday, 2nd June, to select teams to travel to Ireland. First Three in the Petrol Model Event and First Three in the Wakefield Formula Event will be invited to make up the team of six. Full rules and particulars from the Secretary, A.B.A.

FINALS IN IRELAND. The Model Airplane Council of Ireland is inviting representative teams from many countries including U.S.A. to compete in the Irish Nationals on June 23rd. This will be the first opportunity since 1939 of competing against many old friends in the international field, and it is naturally our wish—and yours, too—that as strong a team as possible is put in the field.

SPECIAL SUBSCRIPTION LIST. In order that the selected team may travel to Ireland in fitting style a special Fund has been opened to defray expenses—estimated at One Hundred Guineas. A good start has been made—will you help too ? All contributions, large or small, will be welcomed and suitably acknowledged by the Secretary of the A.B.A., to whom donations should be sent.

A.B.A. GALA DAY—7 JULY—EATON BRAY

Venue. To be held at Eaton Bray Model Sportsdrome on Sunday, 7th July.

Programme (1) Open Duration. (2) Open Glider.

(3) Nearest to 45 secs. and sealed time—all day event.

(4) Petrol Models. BRIEF RULES :

1. 20 secs. Motor Run.
2. Models under 6 c.c. to have all-up weight of 7 oz. per c.c. of engine capacity. Models of 6 c.c. and over to have all-up weight of 9 oz. per c.c. of engine capacity.
3. Highest aggregate of three flights to count.

(5) Flying Scale. BRIEF RULES:

1. Hand launched.
2. 10 secs. Bonus for R.O.G.
3. Any size propeller may be used.

(6) Concours d'Elégance—all types.

(7) Experimental Flying.

(8) Flying Boats—Fuselage Min. X-section $= \frac{\text{Length}^2}{50}$

(9) Seaplanes—Duration.

Substantial Prize List—Simple Rules.

All Contests Open to Members and Non-Members.

Full Particulars, Rules, Entry Forms, etc., from the Secretary, A.B.A.

Mr. EVERYMODELLER— THIS IS YOUR ASSOCIATION

You may not aspire to international honours, you may not even feel any particular urge to win the laurels at a Gala Day, **BUT**—you build models and you like it ! There's a place for you beside those thousands of enthusiasts flocking to our ranks. Much more can be accomplished, greater enjoyment can be gained, and quicker progress achieved by becoming members of a virile, progressive and soundly managed organisation.
Lone Hands and Clubs are joining from all over the country and from overseas. Read the fortnightly NEWS LETTER to learn of the vast strides that are being made NOW.

● **FOR International Rules—Irish Petrol Contest Rules—A.B.A, General Competition Rules—Details of A.B.A. Gala Day—20-page Illustrated Booklet describing the scope of A.B.A.—Specimen copy of the NEWS LETTER—Write, enclosing 2½d. stamp for postage, to MR. H. D. EVANS, Secretary, Association of British Aeromodellers, 28, Hanover Street, London, W.1. Phone: MAYfair 5293.**

ASSOCIATION OF BRITISH AEROMODELLERS

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by W. J. D. Allen. 2s. 6d. 3s. 0d.

Radio navigation is the fourth corner-stone of air navigation, of which the other three are Map Reading, D/R., and Astro Navigation. Each has its own particular use, but when conditions are at their worst radio navigation comes to the fore. This book deals briefly with the electrical side of radio, but covers the navigational side thoroughly.

METEOROLOGY SIMPLIFIED

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This small book, covering the A.T.C. and I.T.W. syllabuses in the subject, gives an informative account of the main principles which govern the behaviour of the weather. It starts from scratch and its simple language will assist the beginner in laying secure foundations before proceeding to a more advanced study of the subject.

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AERONAUTICAL METEOROLOGY

by George F. Taylor. Pitman. 456 pp. 18s. 19s.

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WEATHER PREDICTION

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In non-technical language the author shows how the man in the street may predict with surprising accuracy the approaching weather in his own locality; how the hundreds of observers throughout the British Isles collect their data from the meteorological reports; how weather research is being carried on into the upper regions of the stratosphere; how weather instruments are used, weather maps made, and how the different types of weather form and develop and climates are caused and changed.

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This book has been written to reduce to simple terms the basic truths and principles of meteorology, without mathematical formulae, complicated diagrams, advanced physics or differential equations, that they who fly the air routes either for business or pleasure may interpret intelligently and for themselves, the actual phenomena appearing before them.

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by W. G. Kendrew. Oxford University Press. 474 pp. 21s. 22s.

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In this edition all statistics have been revised, and very many of them replaced by new ones based on longer or more reliable observations. Many records from new stations have been incorporated. In nearly all cases, the means now given may be relied upon as approximately correct.

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Contains information in explanation of technical meteorological terms. In this edition are the equivalent in Danish, Dutch, French, German, Italian, Norwegian, Portuguese and Swedish.

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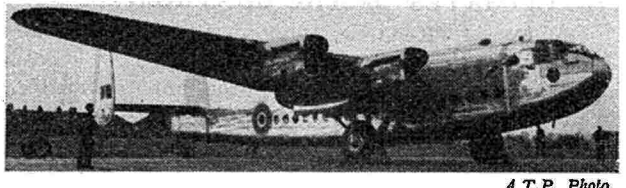
This is one of the series of "Observer Books" written for observers and pilots of the Services to help them in preparation for examinations. It is, moreover, an invaluable book for anyone interested in the navigation of aircraft, which can only be done efficiently by people with a thorough knowledge of the construction and peculiarities of the various maps and charts used for air navigation.

Photo: "The Aeroplane."

Hold that Zebra! *A Miles Monitor high-speed target-tug of the Royal Navy, displaying its black and yellow diagonal stripes.*



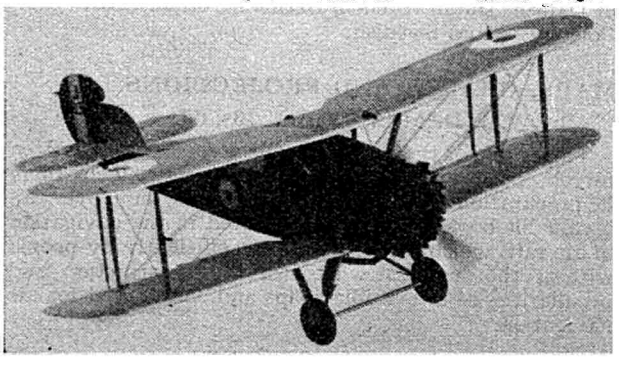
A.T.P. Photo.

Liner from Lyneham. *Avro York, MW 128, of No. 511 Squadron, Transport Command.*

A.T.P. Photo.

Prelude to the Stars. *A British South American Airways Lancastrian, G-AGWI, photographed at the U.N.O. Air Display at Radlett aerodrome.*

(Below.) **The Waggons Roll at Night.** *A Hawker Woodcock fighter as used by Nos. 3 and 17 Squadrons of the R.A.F. before the advent of the Bulldog. The Woodcock was the only R.A.F. machine specially designated as a night fighter before the recent war. Photo: "Flight."*



MONTHLY

By O · G · THETFORD

Dumbarton Sunderlands.

On completion of the Botha contract in 1941, the Dumbarton factory of Blackburn Aircraft commenced a large contract for Sunderland flying-boats. This included 250 aircraft of the Mk. II, Mk. III and Mk. V type. There follows a list of Service numbers of Blackburn-built aircraft which it is felt will be of interest and value to modellers of scale aircraft.

Mk. II: T9083 to T9090, T9109 to T9115, W6000 to W6004. Mk. III: W6005 to W6016, W6026 to W6033, DD828 to DD867, EK572 to EK596, ML835 to ML888, PP142 to PP144. Mk. V: PP145 to PP164.

The last Sunderland built at Dumbarton, a Mk. V, bore the service number VB889.

Singapore Story.

We are indebted to one of our readers for the photograph of the Sunderland of No. 209 Squadron, R.A.F., on the opposite page. Close inspection will reveal that the aircraft is flying with a long jagged hole in the hull bottom. As this Sunderland was taking off from Singapore on January 22 last it struck a buoy and a 15 ft. gash was ripped along the bottom of the hull. Despite this, the Sunderland flew on 1,400 miles back to its home base at Kaitak, Hongkong, and managed to make a forced landing on the beach. The crew escaped uninjured but the aircraft was beyond repair.

Late Series Mosquitos.

Data on four late Marks of the Mosquito has recently been released. The Mk. 33 is the Sea Mosquito deck-landing fighter, now in production at Leavesden for the Royal Navy. The first Sea Mosquito was a converted Mk. VI fighter-bomber, LR359, fitted with four-blade airscrews on Merlin 25 motors. Lt.-Cdr. E. M. Brown carried out the first deck trials aboard *H.M.S. Indefatigable* in March, 1944.

First production Sea Mosquitos had fixed wings, but current production aircraft have folding wings, reducing the span to 27 ft. 3 ins. Standard fittings include a deck hook and provision for a single torpedo externally or a single 2,000 lb. bomb. Wing installations include two 50-gallon drop tanks, or two 30-gallon tanks with rockets either side.

The Mk. 34 is a special ultra long range Photographic Reconnaissance version of the Mk. 16 developed for operations in the Far East. It was about to go into action on VJ-day. Equipped with Merlin 113 and 114 two-stage motors, the Mosquito 34 carries 1,267 gallons of petrol (including two 200-gallon drop tanks) and has a still-air range at 30,000 ft. (using pressure-cabin) of 3,500 miles, cruising at 315 m.p.h.

The Mk. 35 is a high-altitude version of the Mk. 16 bomber and has the same power plant as the P.R.34. Loads include a 4,000 lb. bomb with 50-gallon drop tanks or four 500 lb. bombs with 100-gallon drop tanks.

The Mk. 36 is a development of the Mk. 30 night

MEMORANDA

fighter and is still in production at Leavesden. It is fitted with Merlin 113 motors, but the cabin is not pressurized. Current production Mosquito 36 night fighters are numbered RL232, RL233, RL234, etc.

Transport Command Markings.

For some considerable time aircraft of R.A.F. Transport Command have been employing a four-letter system of code markings and details of this system are now available.

All letter combinations commence with the letter "O" and the second letter indicates the type of aircraft, thus "D" for Dakota, "L" for Liberator, "R" for Stirling, "X" for Warwick, "Y" for York, and "S" for Skymaster. The third letter indicates the squadron, and the fourth letter is the individual aircraft recognition letter.

Thus the marking "OXGK" indicates Warwick III transport "K" from "G" squadron of Transport Command, which happens to be No. 163 Squadron.

Other common markings include "ODA" Dakotas of No. 24 Squadron; "OLB" Liberators of No. 246 Squadron; "ORK" Stirlings of No. 48 Squadron; "OYC" Yorks of No. 511 Squadron; "ODP" Dakotas of No. 525 Squadron; and "OSK" Skymasters of No. 233 Squadron.

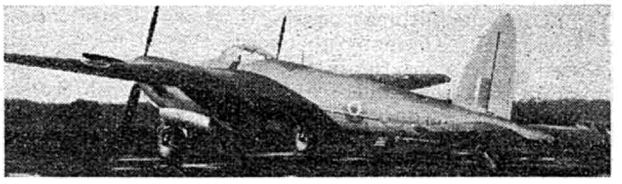
R.A.F. Flashbacks—18.

The Hawker Woodcock was the first fighter from this famous stable to serve with the R.A.F. and was the standard (and only) night fighter with the squadrons in the nineteen-twenties. The Woodcock served with No. 3 and No. 17 (F) Squadrons at Kenley and was ultimately superseded by the Bulldog.

Fitted with a 420 h.p. Bristol Jupiter radial, the Woodcock had a span of 32 ft. 6 ins., a loaded weight of 3,040 lb., and a maximum speed of 143 m.p.h. at sea level.

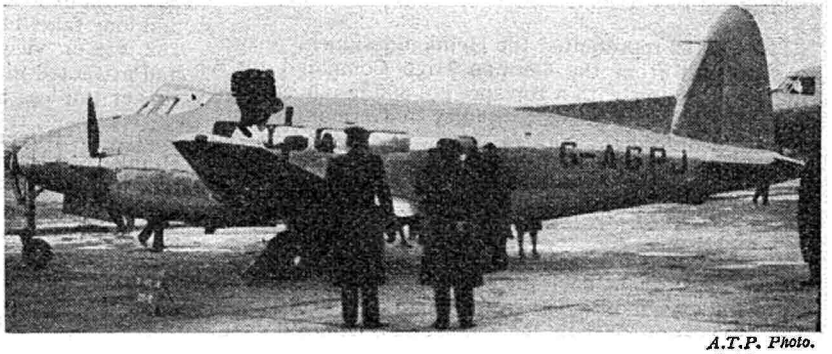
Woodcocks of No. 3 Squadron had a green line along the fuselage and between the wings, and those of No. 17 twin black zig-zags in similar locations. Woodcocks in service were numbered J7962, J7963, J7964, etc.

Porcupine in Trouble. *The Sunderland of No. 209 Squadron, Coastal Command, which ripped its hull on take-off at Singapore.*



A.T.P. Photo.

Hooked Mosquito. *The prototype Sea Mosquito 33, fitted with four-blade airscrews and Merlin 25 motors. Current production models have a revised undercarriage.*

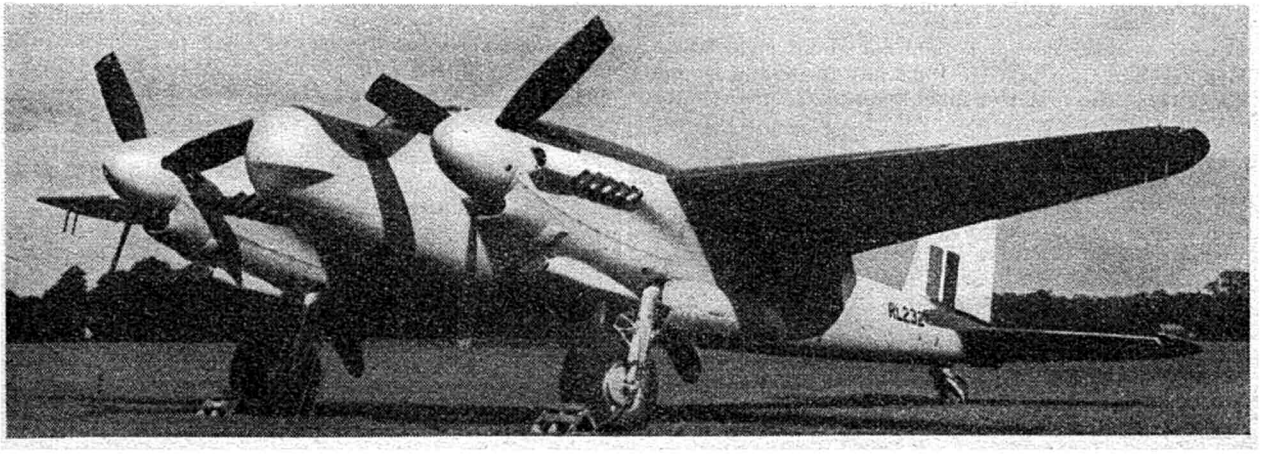


A.T.P. Photo.

(Above.) **Second Thoughts.** *When on view at Radlett last February, the prototype D.H. 104 Dove was seen to have a revised and extended fin fillet.*

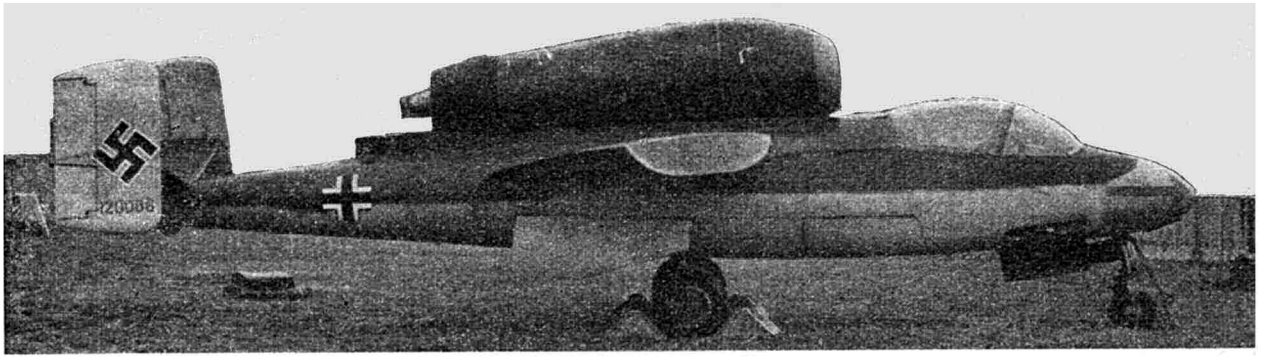
(Below.) **Late Night Final.** *What will probably be the last of the many night-fighter variants of the Mosquito, the Mk. 36 with two Merlin 113 motors.*

A.T.P. Photo.



AEROPLANES DESCRIBED XXXIX

• THE HEINKEL He 162 •



BEFORE the outbreak of war there was considerable rivalry in Germany between the Heinkel and Messerschmitt concerns in the attempt to produce the standard first-line single-seat fighter for the *Luftwaffe*. Messerschmitt won and attained their supremacy throughout the greater part of the war years. Attempts by Heinkel to break into the field from time to time were quite without success. It was not until the last desperate days of the Third Reich that Heinkel once again came to the fore—with their highly unorthodox and incredibly dangerous He 162—commonly known as the *Volksjaeger* or " People's Fighter."

The He 162 represented the Heinkel designers' answer to a request from the German High Command for a single-seat fighter with a top speed of 600 m.p.h. capable of being built with extreme rapidity by Germany's army of unskilled foreign workers. It was designed in the remarkably short period of seven days. In August, 1944, Heinkels were awarded a contract for 1,000 *Volksjaegers*, to be delivered within nine months.

With its jet unit mounted high above the fuselage, the He 162 brought back memories of the famous flying bomb and was, indeed, little more than a piloted version of that weapon with a few additional refinements to make it into an interceptor fighter. The He 162 was originally intended to be fitted with two jet units, one above and one below, but it was finally decided to delete the lower unit owing to the twin difficulties of shortage of jet units and the race against time.

After working day and night for about eight weeks, Heinkels had their first He 162 ready for test in December, 1944. The first test flight took place on December 6—and the wings were pulled off in the air. Investigations proceeded forthwith and it was found necessary to strengthen the wings, modify the tail assembly, and alter the position of the C.G.

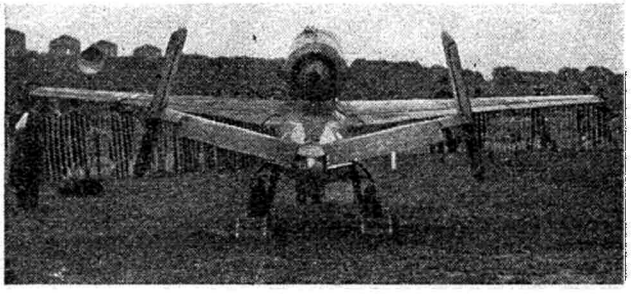
At length the second prototype was tested and found satisfactory. Production commenced. But it was too late. By VE-day only about 100 *Volksjaegers* had been completed—and all the ingenuity had been in vain.

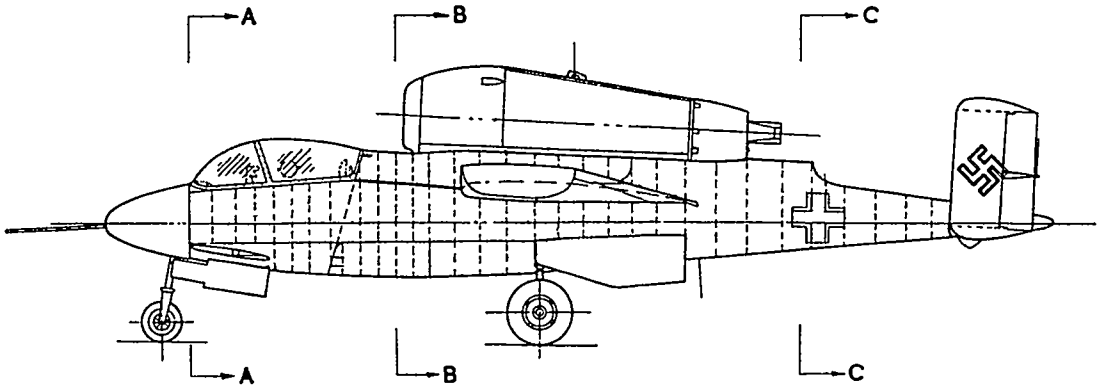
Captured examples of the He 162 were brought to the R.A.F. in Britain and test-flown extensively, though not without loss of life due to their high landing speeds and long take-off runs. In the autumn of 1945 a Heinkel 162 was on view to the public in Hyde Park, London, and attracted much attention, together with the Me 163 rocket tail-less fighter.

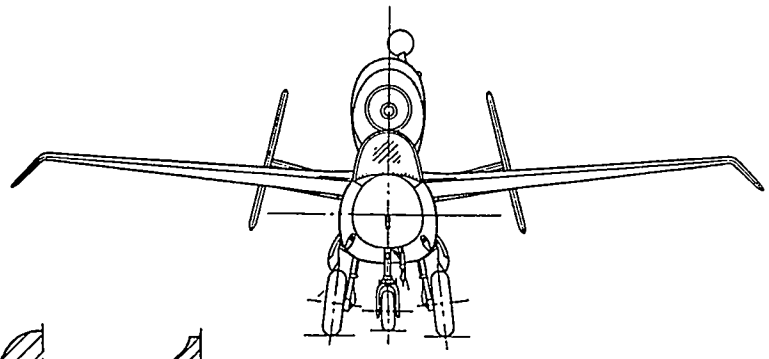
Mr. C. Rupert Moore, A.R.C.A., has featured the Heinkel He 162 on the cover this month. Mr. Moore's painting was based on an extensive study of a captured He 162 at Farnborough and special attention was paid to the accurate reproduction of the camouflage colours. It will thus be of especial value and interest to solid scale modellers.

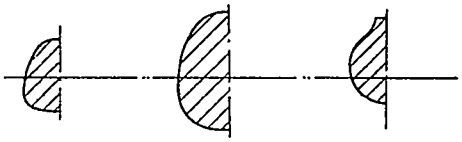
SPECIFICATION.—Single-seat jet-propelled fighter with wooden wings and metal monocoque fuselage. Tricycle undercarriage. One B.M.W. 003 jet unit developing 1,760 lb. static thrust. Armament: Either two 30 mm. Mk. 108 or two MG. 151 guns mounted in the nose. Span: 23 ft. 7¾ ins. Length: 29 ft. 8½ ins. Wing area: 120 sq. ft. Loaded weight: 5,940 lb. Maximum speed at 19,700 ft.: 522 m.p.h. Rate of climb: 4,230 ft./min. Ceiling: 39,400 ft. Range: 434 miles. Take-off run: 710 yards.

A.T.P. Photos.









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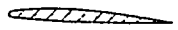

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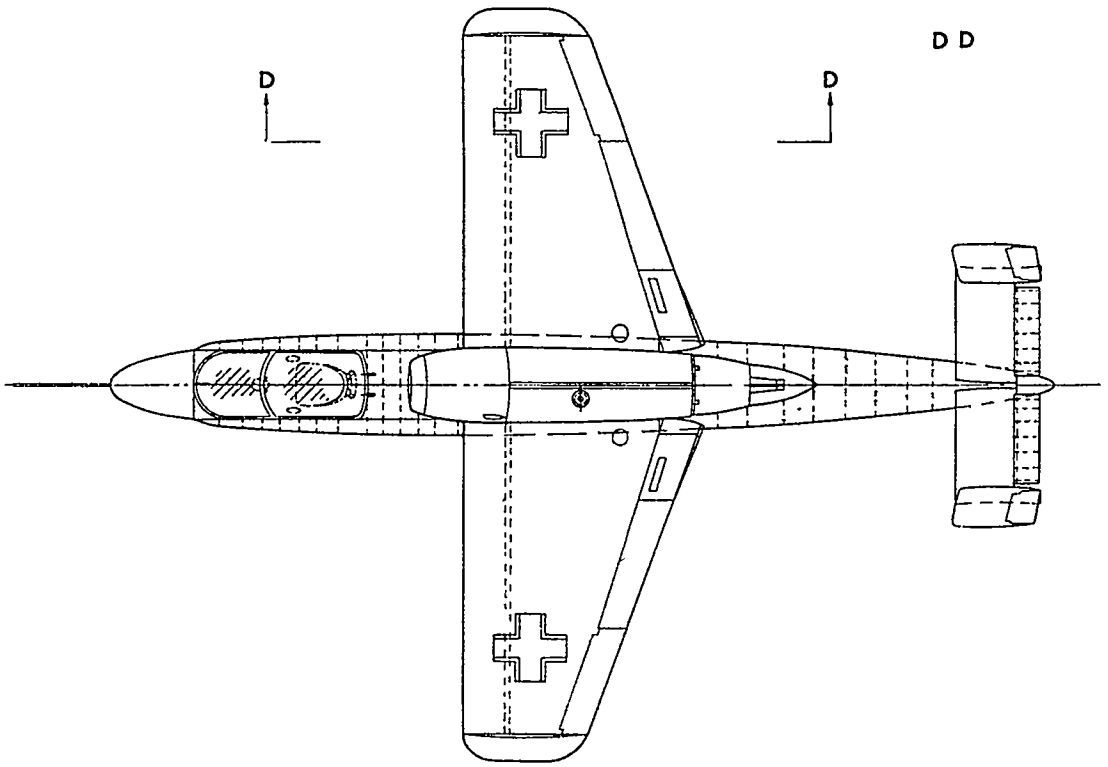

HEINKEL He 162A

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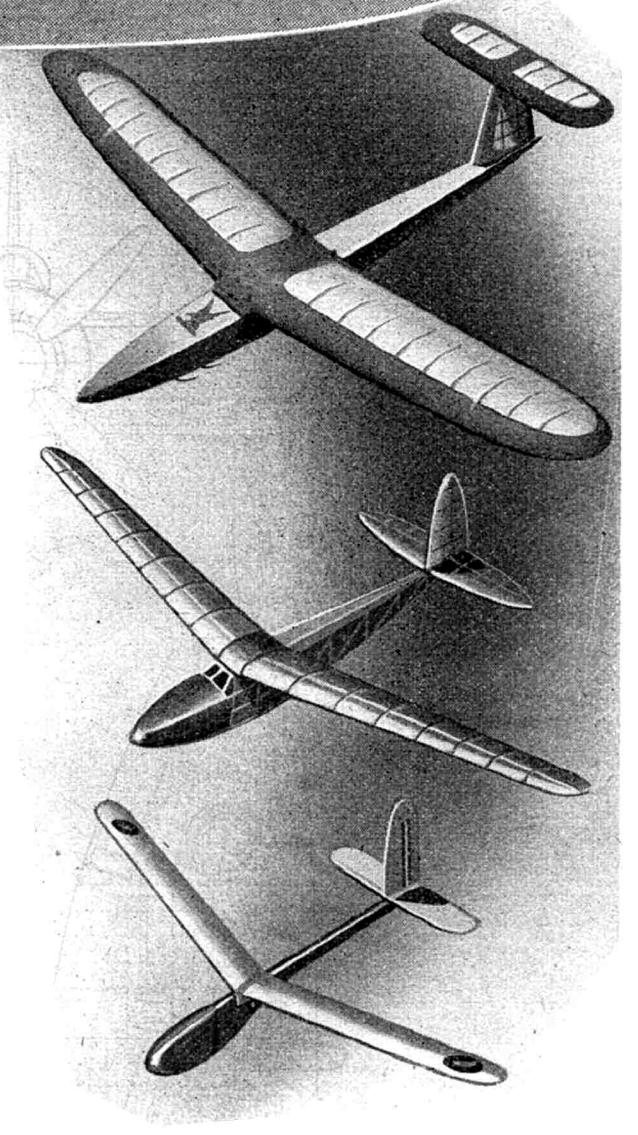
Efficiently Designed FOR ALL COMPETITION & AMATEUR ENTHUSIASTS



"CLUB" CONTEST GLIDER

The last word in tow-line glider design, having negative incidence wing tips. Span 48 ins. Weight 8 ozs. Triangular plywood fuselage, high tail, mounted on fin. Comprehensive kit. Easy to construct. Full detailed plan.

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141. STRATFORD RD. BIRMINGHAM, 11.

Club News

BY CLUBMAN

Winding Operations at a recent Indoor R.T.P. meeting of the Oxford Civil Defence M.A.C.

AFTER last month's somewhat generous dope of S.M.A.E. news, I had intended to devote my notes this month to other items of general interest, but recent developments force me to report happenings of a kind that I had hoped were divorced from the conduct of our movement.

Following an adverse vote on certain proposals brought forward at the Annual General Meeting by the Northern Heights Club (voting incidentally which went against such proposals by a large majority), this club saw fit to attempt dictatorship to the Society by threatening that, if the decision was not reversed, and, in effect, the Northern Heights Club given all its own way, the club members who had been voted into office in various capacities would resign.

Presumably it was thought that this action would "put the wind up" the rest of the Council, but I am pleased to learn that this dictatorial attempt failed miserably, and the resignations have been accepted without comment. In my opinion, the Society will get along better without individuals who attempt such undemocratic tactics in our hobby—a sport that is noted for its fairmindedness.

The position now is that Messrs. Bell, Copland and Wilson have resigned their offices as Secretary, Technical Secretary and Press Secretary respectively. The breach was immediately filled by willing workers, and Mr. L. M. Walker, of 16, Connifer's Close, Kingston Road, Teddington, is acting as Honorary Secretary, and all correspondence should be addressed to him. Mr. G. W. W. Harris—a well-known contributor to this magazine—is the new Technical Secretary, and I know of no better person to carry out this increasingly important office.

It should be pointed out that the above decisions of the N.H. Club took place at a committee meeting, and it is to the credit of the members as a whole that, when the matter was put up to them at a general meeting, the proposals received little or no support, the same thing happening at the annual general meeting of the London Area clubs, who turned the thing down flat. This alone should be enough answer to those who are patently out to sabotage the movement.

The final list of S.M.A.E. Competitions for the 1946 season is to hand, and shows a completely comprehensive range of activity that should satisfy every taste. A move towards centralisation of events is natural now that travel facilities are improving, but I hope that the lessons learnt from the de-centralising of events (so far as the more remote clubs are concerned) will be kept in mind when compiling future programmes.

The NORTHERN AREA clubs are certainly go-ahead, and seem to be very well organised. The four contests noted above for Plugge Cup points are to be conducted as centralised events at various centres in the area, the first being run at Rhyl, second at Doncaster, the two remaining events at Baildon Moor. C. J. Davy, of Blackpool, won the December Area contest for consistent flying, his error only being 5 secs., while D. Salloway, of Rochdale, won the January R.T.P. event with a time of 1 : 55.

The MIDLAND AREA, while not being quite perhaps so contest-minded as their Northern brethren, nevertheless held an indoor event recently, some quite good times being put up as follows :—

R.T.P			
K. Thomas	(E. Birmingham)	2 : 45	2 : 24
P. H. Winter	,,	2 : 06·6	2 : 14·4
A. J. Barr	(Coventry)	1 : 31	2 : 03·8
Speed			
G. F. Bradwell	(Birmingham)	27 ; 2 m.p.h.	
H. Parham	(Worcester)	23 : 16 ,,	
L. Watts	(W. Coventry)	20 : 12 ,,	
Free Flying			
P. H. Winter	(E. Birmingham)	2 : 54	1 : 38
R. Oliver	(King's Heath)	1 : 47·6	2 : 36
R. Monks	(Birmingham)	2 ; 12·8.	1 : 44·7

S.M.A.E. EVENTS FOR 1946.

April	14th	Gamage Cup	(Open Rubber)	D/C.
	28th	M.E. No. 2 Cup	(Fuse. Rubber)	PLUGGE.
May	5th	Shelley Cup	(Petrol)	C.
	12th	M.E. No. 1 Cup	(F.A.I. Glider)	D/C.
	26th	Pilcher Cup	(Glider)	PLUGGE
June	9th	Hamley Trophy	(Petrol)	C.
	16th	Weston Cup	(Wakefield)	PLUGGE
	30th	National Cup	(Fuse. Rubber)	D/C.
		Frog No. 2 Cup	(Open rubber, juniors)	D/C.
July	14th	Thurston Cup	(F.A.I. Glider)	PLUGGE
Aug.	4th	Bowden Int. Trophy	(Petrol)	C.
	11th	Flight Cup		D/C.
		Ladies' Cup		D/C.
	26th	K. & M.A.A. Cup	(Biplanes)	D/C.
		Civil Services Cup	(Payload)	D/C.
Sept.	1st	Gutteridge Trophy	(Wakefield)	C.
		Frog No. 1 Cup	(Flying Scale)	C.
	8th	Lady Shelley Cup	(Seaplanes)	D/C.
		White Cup	(Flying Boats)	D/C.
	15th	Cup	(Petrol)	C.
	22nd	S.M.A.E. Cup	(Rubber and Glider)	D/C.

C — Centralised. D/C — Decentralised.

PLUGGE — Will be organised by areas as semi-centralised events.

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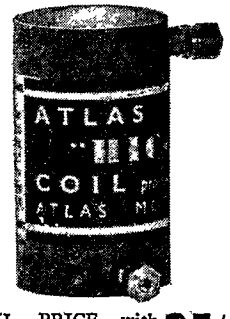
Post your Order for immediate despatch

THE ATLAS "HIC-4" IGNITION COIL



Weight 2½ ozs.

Frequency range 10 to 130 cycles at full efficiency.

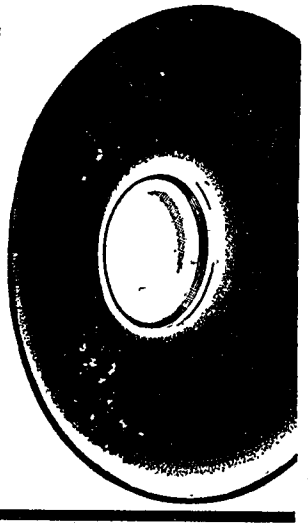
Operational voltage 2 to 3.

COIL PRICE with "matched" Condenser **25/-** Or 25/6 by post. Condenser only 2/6, postage 3d. extra.

The enormous frequency range, equivalent to engine speeds of from 600 r.p.m. to 8,000 r.p.m., over which the HIC. 4-coil operates is made possible by the use of special high quantity alloy laminations in the core, and by the careful proportioning of the primary winding so that the primary self-inductance is kept well below the maximum permissible. The insulation throughout the HIC. 4-coil is ample and generous, but it is recommended that the spark length should not exceed ¼" in the open air. Working at the recommended voltage of 2 to 3, the coil remains cool, but should it become heated no serious trouble will occur, provided the coil is allowed to cool thoroughly before being put into use again. A condenser value of 0.1 m.f.d. is recommended for use with this coil. The coil will function on one penlight cell weighing 1 oz., better results still, will be obtained with two cells in parallel.

The Wheels with patent hubs

"RIDERWHEELS"



These wheels are light, weighing only 1½ oz., yet sturdy in construction, easily assembled and fitted, and will inflate to 3½ ins. diameter. Cycle pump adaptor is included. Illustrated instructions are sent with every pair. The "Riderwheel" has a patent hub with black rubber tyre, and is very smart in appearance.

PRICE, per pair **17/6**

Post and packing 6d.

ATLAS MOTORS

STUDHAM :: Near DUNSTABLE :: BEDS

The MANCHESTER & D. COUNCIL of M.A.C.'s held two indoor events, the first in February attracting over 70 fans for an r.t.p. contest. Ten clubs entered, the winners being Cheadle with an aggregate of 158 points, followed by Ashton 120·6 and Farnworth 114.

A much bigger event was the Indoor Rally staged on the 17th March, when flying took place for the "Daily Dispatch" Cup. Over 500 spectators from all parts of England were present, all of them as finicky about cold draughts as a Victorian grandmother! As was expected, the high lights of the contest were the London Area's microfilm covered models, the masterly control and flying by Bob Copland, and the fine display given by thirteen-year-old J. Wingate of the Streatham club, who delighted everyone by gaining second best place for the London team. Mr. A. F. Houlberg presented the cup to Wingate as Captain of the London Team, the results being :—

INTER AREA CONTEST.

		For 3 flights.
LONDON.		
R. Copland	(N. Heights)	748·4 secs.
J. Wingate	(Streatham)	584·0 ,,
R. Rock	,,	561·0 ,,
S. Mayo	,,	516·7 ,,
	Total	2,410·1 ,,
NORTHERN.		
W. A. Hetherington	(Doncaster)	462·0 secs.
F. Gearing	,,	446·0 ,,
B. T. Faulkner	(Cheadle)	252·0 ,,
W. Higginbotham	(Ashton)	177·0 ,,
	Total	1,337·0 ,,
MIDLAND.		
R. Parham	(Worcester)	379·0 secs.
,,	,,	69·5 ,,
	Total	448·5 ,,

The best flight put up by a Class "A" model was by Copland with a time of 5 : 20, while the best Class "B" time was by C. M. Holden, of Farnworth, whose model flew for 1 : 05.

A reader writes suggesting that, in order to still further compare times reported with those obtained in his own club, it would be a good idea if Press Secretaries stated the name and/or type of model employed. I think this a worth-while suggestion, and would be obliged if the responsible officials will include the information in future reports.

Despite the proverbial "mud to the eyebrows" of Chingford Plains now that spring is here (!) the stalwarts of the CHINGFORD M.F.C. have been trying out their winter work, and the advent of better weather should soon see the usual gatherings on this well-known spot each Sunday. Meanwhile meetings still continue every Tuesday and Friday at the Wellington Road School for indoor flying, and all are welcome.

As reported earlier, the CHEADLE & D.M.A.S. won the Northern Area Indoor Trophy, and, somewhat naturally for a young club, feel very pleased with their success. The list of club records submitted is quite imposing, and is given here in full for the interest of readers :—

Rubber	(R.O.G.)	B. Faulkner	1 : 34
,,	(H.L.)	A. Bailey	1 : 30

Glider	(Tow)	A. Bailey	27 : 34 o.o.s.
,,	(H.L.)	T. Moulson	: 54 o.o.s.
R.T.P.		B. Faulkner	2 : 07

A. J. Barr, of the COVENTRY M.A.C., has broken the club r.t.p. record with a time of 2 : 43, also winning the Senior Indoor Trophy with a total of 3 : 26·5 for two flights. The junior event went to B. Roberts who aggregated 2 : 56·9, setting up a new junior record of 1 : 33 at the same time.

The FARNWORTH AEROMODELLING ENGINEERS, formed some six months ago, are now firmly on their feet. Thanks to the generosity of a farmer, members have the use of several fields of a decent size, also the use of an adjacent golf course. Sailplanes are the club's main interest, though r.t.p. flying has been by no means neglected this winter. In the former class, "Mick Farthing" sailplanes have proven themselves extremely popular, over a dozen having been made and successfully flown. More substantial evidence of the club's progress may be seen in the trophies held, teams having entered and returned victorious from five gliding contests. Club records are as follows :—

Glider	(Senior)	C. M. Holden	.. 4 : 00
	(Junior)	D. Nuttall	.. 2 : 10
Rubber	(Senior)	C. M. Holden	.. 1 : 23
R.T.P.	..	C. M. Holden	.. 1 : 57
,,	Speed	R. K. Thomasson	.. 21 m.p.h.

The CARDIFF M.A.C. will stage the "Tod Lewis Cup" contest for open rubber-driven duration at Ely Racecourse, Cardiff, on June 9th. All who are interested please contact Mr. B. Morgan, 47, Richards Street, Cathays, Cardiff.

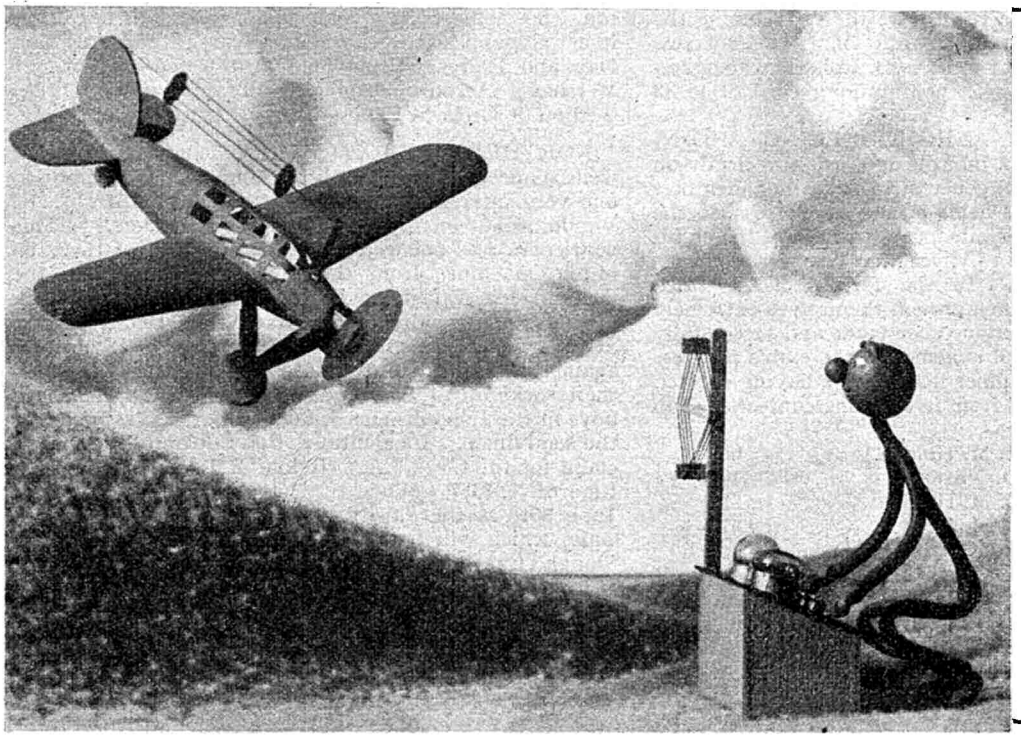
The CAMBRIDGE M.A.S. is emerging from its novitiate stage, and shows good promise for the season. They are most fortunate in having been presented with some 400 plans by the Cambridge University Air Squadron, whose officers have undertaken to give them tuition in aerodynamics at the Cambs. Research Labs. An Open Day and Rally is being held at the end of April at Marshall's Aerodrome, details obtained from D. A. Gordon, 9, Orchard Estate, Cherry Hinton, Cambridge.

NORTHERN HEIGHTS M.F.C. continued with a well-balanced programme throughout the winter months, one very interesting lecture being given by Mr. J. R. Vanderbeeke on "Rocket-propelled Gliders." This gentleman was engaged on the production of these 90 m.p.h. machines from their inception, supplying the demand for a fast-moving target for light Ack-Ack gunners. A friendly indoor match between N.H. and Streatham saw the visitors win by a total of 12 minutes against the home team total of 11 : 15, but the lads pulled their socks up to win handsomely from the Blackheath boys in the London Area Indoor Cup, thus passing on to the semi-finals. Incidentally, Bob Copland has put in a claim for the Class "A" (Indoor R.T.P.) record with a time of 5 : 31·7. Whew! That'll take some beating. June 30th is the date fixed for the Northern Heights Gala, which will be held on Langley Aerodrome, near Slough, Bucks.

NEWS!! A thermal visited the TORQUAY M.A.C. recently, and H. Wedden, flying his "Ivory Gull," took full advantage of it to break the club record with a time of 12 : 08 o.o.s., the model last seen well out to sea.

"WHAT'S WORSE, HE SAYS HE HAS NEVER HEARD OF THE N.G.A."

BEN TWYRE • By J. H. MAXWELL



There are knobs to control each manœuvre in flight,

To climb, or to bank; turn left, or turn right,

But there's need for quick thought, if the plane's to survive,

When the throttle's full on, and the thing jams at "DIVE."

The HATFIELD M.A.C. recently organised an Outdoor Rally at Radlett. The weather was favourable, and several good flights were made by the four clubs present, the visitors being Radlett, Cranbourne and St. Albans clubs. The best times were as follows:—

Open Rubber.	J. Bond	(Cranbourne)	1 : 53
	Greenlands	(Hatfield	1 : 12·9
Open Glider	D. Hodges	(Cranbourne)	2 : 06

At a recent meeting, J. Fraser's new lightweight glider made four consecutive flights of over one minute each, raising the club record to 1 : 36·2. He also holds the r.t.p. record with 1 : 03·5 his model being the Warring "Pusher."

Members of the WILLESDEN & D.M.A.C. have been tackling r.t.p. speed work lately and A. Setchfield holds the present record with a speed of 42 m.p.h. over three laps.

The BRENTWOOD & D.M.A.C. will be holding a "Glider Gala" on Childerditch Common on May 12th. All clubs are invited to enter a team of four, full particulars to be obtained from Mr. F. Wood, 20, Woodstock Avenue, Harold Park, Essex.

Scratch meetings held by the MERSEY M.F.C. proved so well supported that a contest was staged for r.t.p. jobs, T. Clayton winning with a time of 1 : 09·2. E. G. Bibby came next with 1 : 08·8 and J. H. Wilson clocked 1 : 05·4. Pretty close going that!

The outstanding news of the month from the CROYDON & D.M.A.C. was their win over the North Kent boys on their own ground in a r.t.p. team event. Croydon totalled 483·6 against N. Kent's 300·5, junior member Marcus setting up a new club record of 3 : 24·5 in the course of the meeting.

Since the formation of the DOVER YOUTH CLUB M.F.C. was announced in these columns, great progress has been made, and membership now totals over the 60 mark. An official flying ground has been obtained at Whinless Downs, the club record being set up there by 15-year-old J. Willson, whose 30-in. span glider clocked 4 : 30 o.o.s.

The SOUTHAMPTON M.A.C., after six months of teething troubles, has now been officially formed, and a complete set of rules and constitution adopted. Besides the huge hall already at their disposal, a fine room has been secured in a football pavilion on the local common, from which flying meetings are conducted. With such facilities this club should go far!

The ST. ALBANS M.A.C. held an exhibition of solid and flying models on March 2nd. The county elections and snow reduced the public attendance, but despite that the members put on a very good show that augers well for the future of the club.

The old Southend Municipal College Modelling Club has been renamed the SOUTHEND MODELLERS ASSOCIATION, and although the club is small in numbers at present, activities include rocket propulsion (with little success) and model V.2's with too much! One such rocket-propelled model, 30 ins. in height, disappeared upwards in a nicely curving parabola to land—that's what's worrying them!! Headquarters are over the College Canteen, which proves a most insidious lure to the members.

The STOCKTON & D.M.F.C. recently celebrated its first birthday, and on the whole had a successful year. "Mick Farthing" gliders were most popular in the outdoor sphere, especially when modified by the fitting of an auto rudder. Best time was 2 : 45 from a 300-ft. line, while the best H.L. time was 1 : 28. In the r.t.p.

sphere Warring's Contest and 16-in. fuselage jobs were most successful, best time with the former type being 1 : 40 r.o.g. An inter-club affair with the Eston M.A.C. resulted in a win for the local club, D. F. Brown putting up the best time of 1 : 02.

Sir Lindsay Everard is to open an exhibition to be held by the LEICESTER M.A.C. in the Great Hall, Leicester College of Art and Technicology, on the 26th and 27th April, when all types of models will be on view.

The ROMFORD & D.M.A.C. have already held a show of their own, this being staged in the foyer of a local cinema with great success. The show ran for two weeks, and 25 members were added to the roster in consequence. Two petrol models have already been flown this year, a 66-in. span high wing cabin job unfortunately minus a timer! The time set up an unbeatable record—if such a flight can be counted in the record annuls, and the model most fortunately landed in a back garden undamaged, or without causing any damage.

Two chaps anxious to start the ball rolling with clubs in their area this month are: J. F. Ransom, 29, Litchfield Road, Sutton, Surrey; and E. Leybourn-Needham, 12, Bradshaw Field Avenue, New Moston, Manchester.

Well, chaps, that's the lot for this month, and in spite of the preponderance of indoor news, I think we all find it interesting, especially when compared with our own efforts. Keep it up.

THE CLUBMAN.

NEW CLUBS.

KINGS LANGLEY AEROMODS.
C. G. Taylor, 51, Woodland Drive, Watford, Herts.
UPLANDS M.F.C.
J. Newton Jnr., 30, Downs Court Road, Purley, Surrey.
NORTH WALSHAM & D.M.A.C.
W. G. Roff-Marsh, 16, Norwich Road, North Walsham, Norfolk.
THE PADDOCKS M.A.C.
D. Haynes, Paddocks, Hurst, Reading.
CHESHAM M.A.C.
L. F. W. Howe, "Staploe," Bellingdon Road, Chesham, Bucks.
EDWINSTOWE M.A.C.
G. N. Bryan, Eastfield Cottage Farm, Clipstone Road, Edwinstowe, Mansfield, Notts.
SOUTHGATE & D.M.F.C.
Hon. Secretary, 84, Aldermans Hill, Palmers Green, N.13.
SARUM M.A.C.
J. A. Pothecary, 14, Russell Road, Salisbury, Wilts.
LOUGHTON M.A.C.
J. W. Dilworth, 9, Elmshurst Way, Loughton, Essex.

UNCLAIMED MODELS.

A small number of models from the Dorland Hall Exhibition have as yet been unclaimed. Will any entrant who has not yet received his model please make application to The Aerodrome, Billington Road, Stanbridge, Nr. Leighton Buzzard, Beds., marking his envelope "Model Claims" in the top left-hand corner.

DID YOU MISS THEM?

A limited number of back issues of the January, February and March, 1946, "Aeromodellers" are available from our offices at Allen House, Newarke Street, Leicester, price 1/- per copy. Order your copy now and avoid disappointment.

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ADVERTISEMENT RATES;
Private **Minimum 18 words 3s. and 2d. per word for each subsequent word.**
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Box numbers are permissible—to count as 6 words when costing the advertisement.
COPY should be sent to the Classified Advertisement Dept. the "Aeromodeller", The Aerodrome, Billington Road, Stanbridge, Beds.

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Any AEROMODELLERS prior to Aug., 1938. Must be clean and complete.—D. M. Happleston, 2, Clough Road, Rotherham, Yorks.

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Brown Junior 10 c.c. engine, good serviceable condition, complete with accessories. Cash or part exchange for aeroplane books.—Dowdeswell, Bushley, Station Road, Alcester, Warwickshire.

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Ivory Gull (modified) and Jackdaw II, 17s. 6d. each. Both in good condition. Several other flying models and plans.—Box No. 16.

Volume IV A.F.P., Model Aeroplane Manual, Gyford Gull, Hudson, Plans, 12 in., two 7 in., and one 5 in. prop. 25s. lot.—R. Barnes, 25, Bedford Av., Whitby, Wirral.

Copies "Aeroplane" and "Flight." Harborough and other aeronautical books, A.P.S. flying and solid plans. Many of above in brand new condition.—J. F. Blatchford, 7, Limegrove Road, St. Thomas, Exeter, Devon.

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Atlas 3.5 c.c. engine complete with coil, condenser, plug and prop. Brand new, £7 10s.—Tillett, 2, Branksome Close, Norwich.

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A.F.P. Vols. I–V, as new, £4 10s. AEROMODELLER, Jan. 1943–Feb. 1946, £1 10s.—Spencer, Gilbert House, Wombourne, Staffs.

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A.F.P. Vols. I, II and IV, 15s.; Vol. V, 25s.; or best offer. Elliott, 23, Northfield Ave., Wigson, Leicester.

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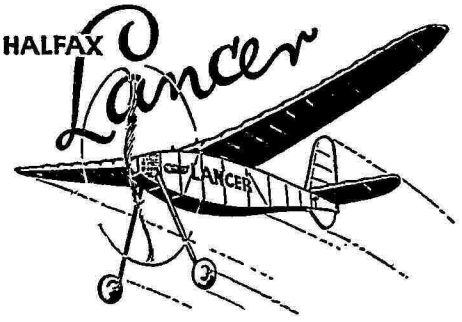

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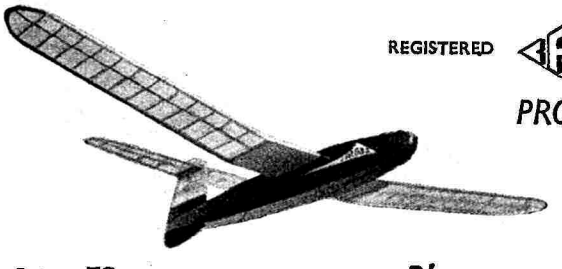

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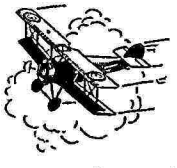

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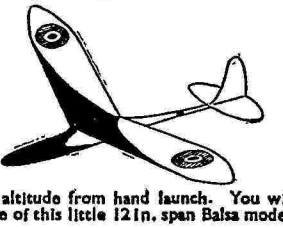

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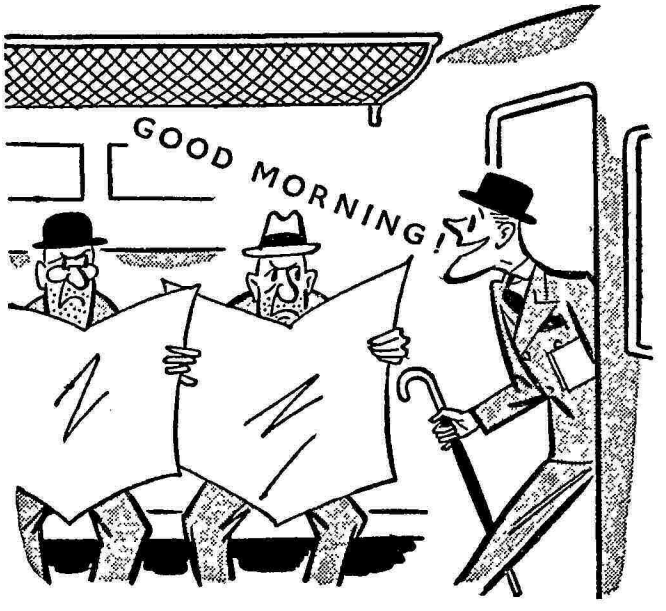

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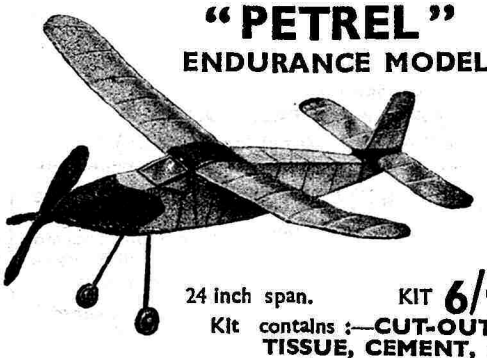

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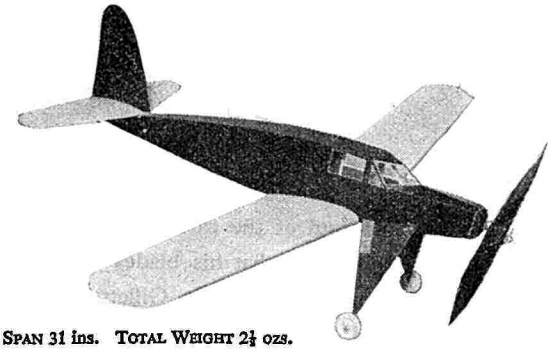

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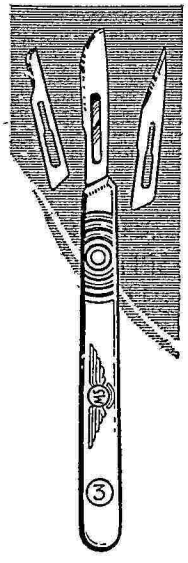

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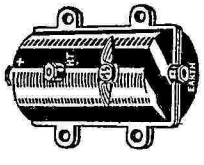

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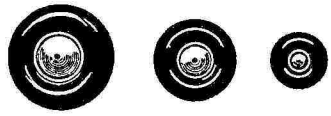

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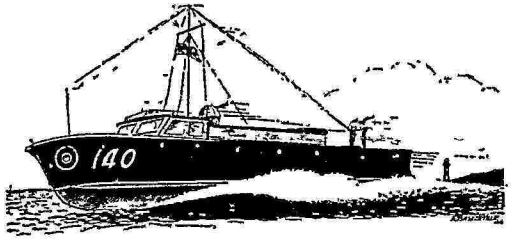

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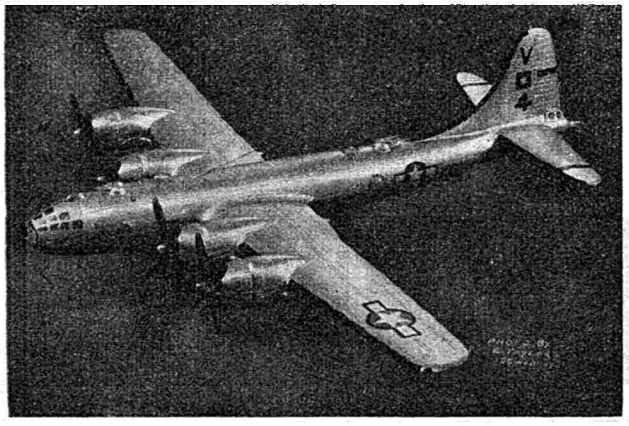

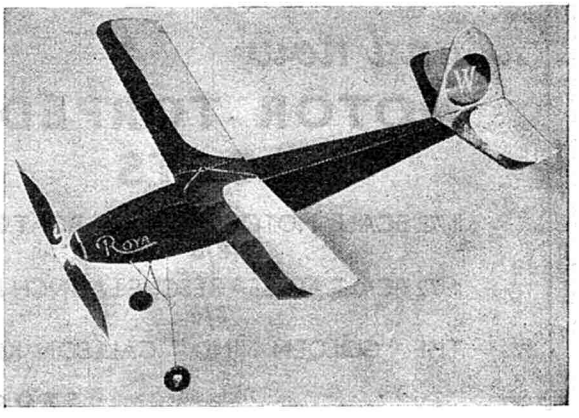

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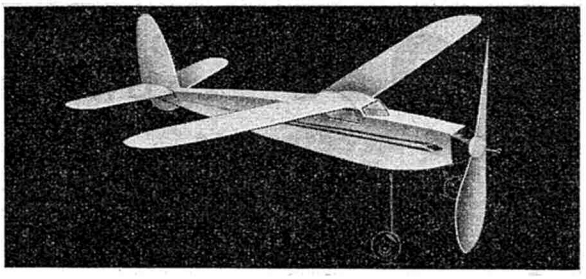

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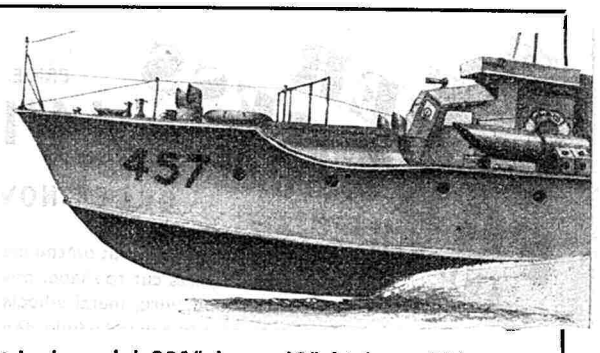

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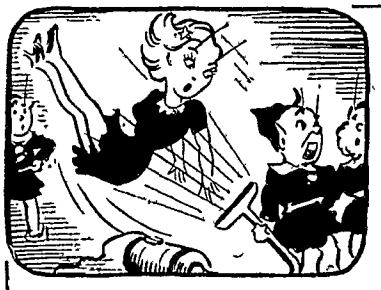

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9"	1/4	1/8	„
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PITCH = Diam. × 1.50

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1½" diam. 5d. per pair.
2" " 6d. " "

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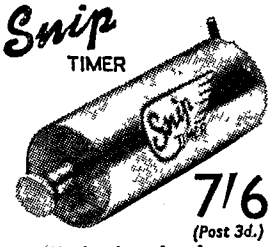

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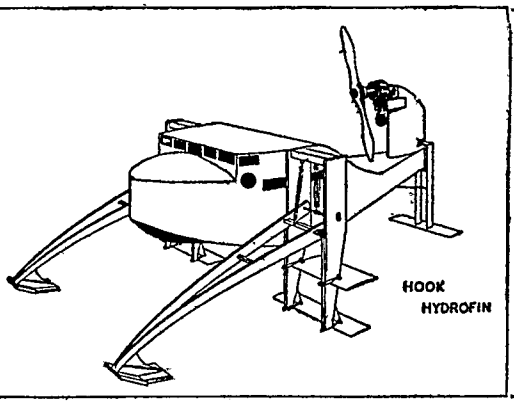

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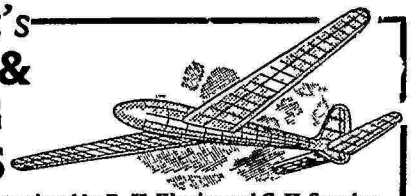

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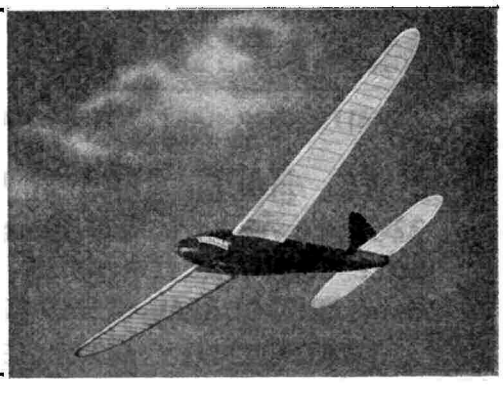

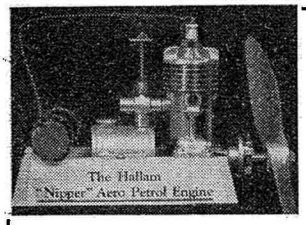

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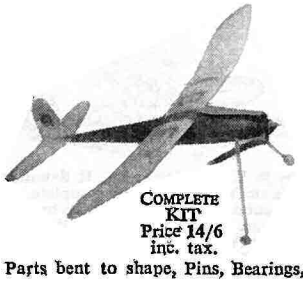

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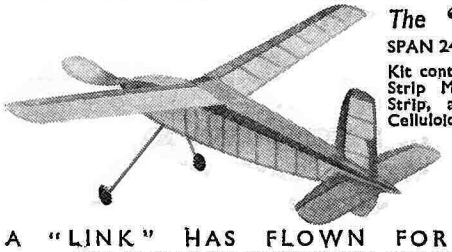

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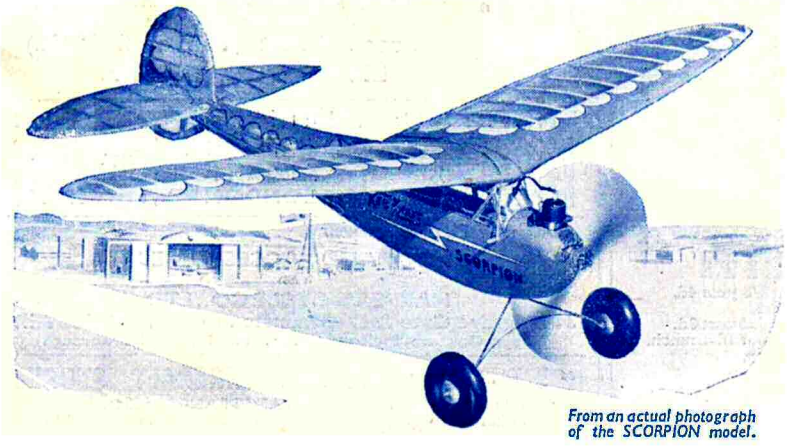

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