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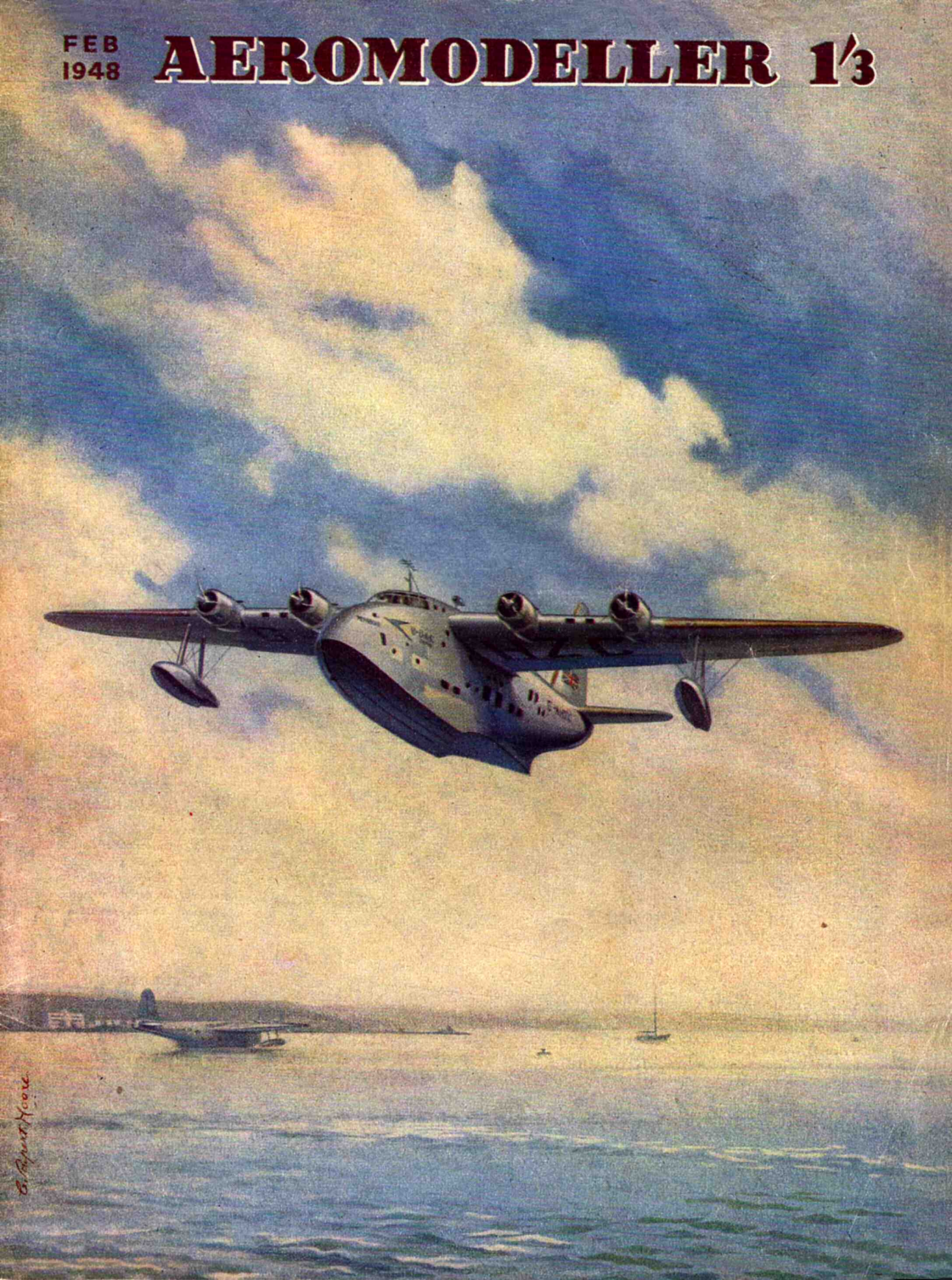
1948

AEROMODELLER 1/3



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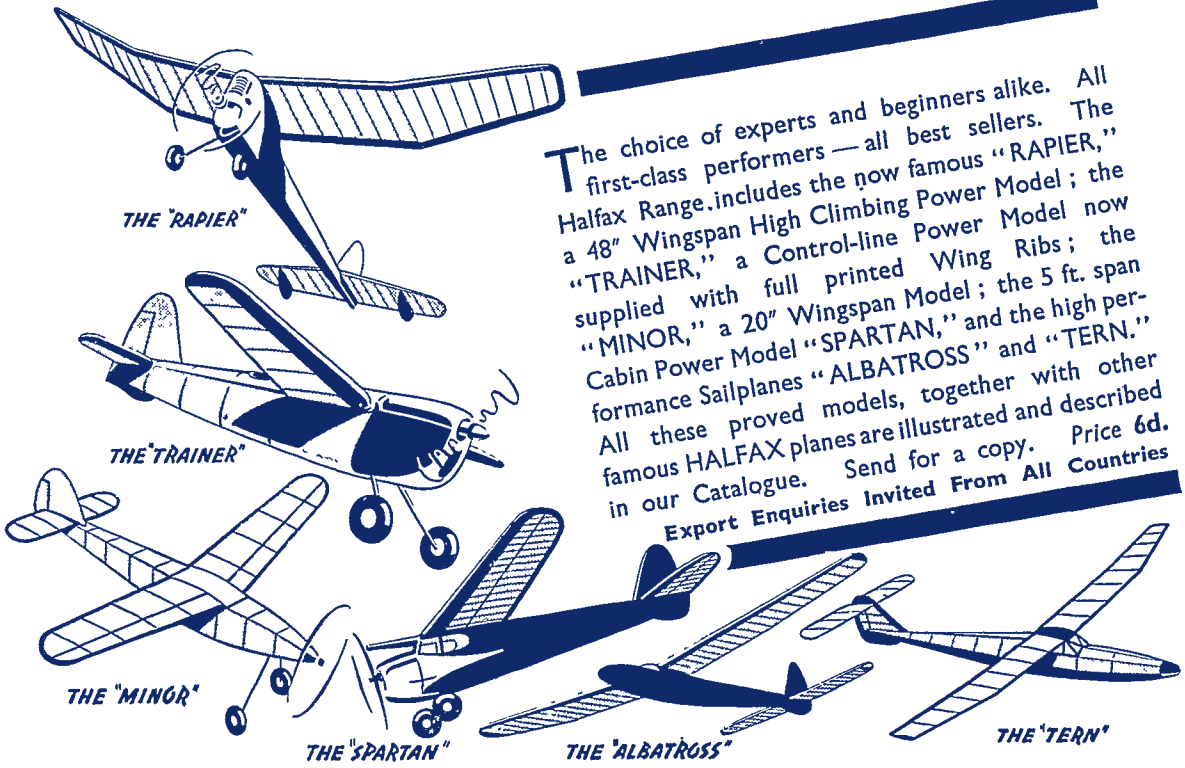

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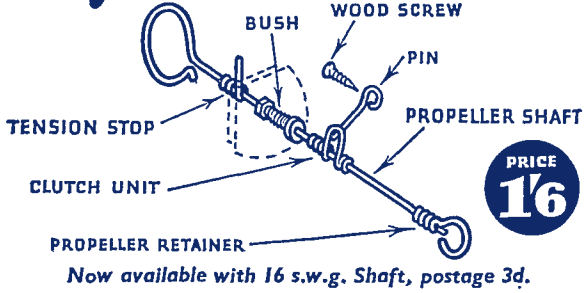

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AEROMODELLER
INCORPORATING "THE MODEL AEROPLANE CONSTRUCTOR"

MINE HOST.—The aeromodeller is found in all walks of life. Here is Mr. Culver, landlord of the "Jolly Farmers" at Purley, Surrey showing one of his models to a customer. Judging by the model, our worthy host would appear to draw a profile as well as he draws a pint!

CONTENTS

VOL. XIII No. 145 FEBRUARY, 1948

EDITORIAL

TIGHTENING OUR BELT.

We hate to strike a dull note so early in the year but a 10% cut in paper supplies made a while back forces our hand. Knowing that readers will bear with us we announce without any preliminaries that it is necessary to reduce the size of your favourite journal by eight pages. We have postponed this unfortunate, but nevertheless inevitable step as long as possible, but to quote an old adage " One cannot get a quart out of a pint pot ". The only alternative was to reduce the number of available copies and this we quite naturally discarded as it would have meant depriving a considerable number of readers of their copy each month.

We are of course, doing everything possible to counteract the effect of this loss of space from our readers' point of view, and furthermore have reduced the number of advertisement pages by three. This in order to maintain the balance between reading and advertisement matter that we have adhered to in the past. In this way the loss is fairly shared between reader and advertiser alike, a point which we know will be appreciated by all.

We intend to reduce, and in some cases alternate the various features. For instance, the articles on full size aviation such as " Aircraft Described " and " Monthly Memoranda " will normally be allotted a total of three pages only, as the AEROMODELLER is after all essentially a *model* journal. We shall, as and from the March issue be reducing the size of our text type very slightly which will in effect give us an extra three pages of reading matter as compared with the size of type used at present. Plans may also be reduced in certain cases so by these several means we shall be giving virtually the same amount of reading matter as before.

Of one thing readers can be certain and that is that we shall continue to maintain the high standard that this journal has set in the past, and as soon as conditions permit we shall publish once again an AEROMODELLER of opulent size covering every aspect of model aeronautics.

Here, then, is the AEROMODELLER with its belt tightened yet another hole, but still trying to meet the needs of its readers. As always we welcome suggestions and constructive criticism, but do not blame us for the lack of space. Brickbats, if any, in this connection may be addressed to the Board of Trade and not to us !

Fly with Care.

A recent paragraph in a local paper appertaining to the flying of models on Epsom Downs focuses attention once again on the question of public safety and the model aeroplane. The Home Office, we are interested to note, have informed the Downs Conservators that control of models flown on the downs would have to be by prohibition rather than regulation and also make the point that no local authority has ever made a by-law regulating the flying of model aircraft over open spaces. The Home Office also stated that present circumstances did not warrant prohibition *no cases of damages or injury having been reported by the police.* It is indeed a relief to read this last sentence as we still hear of cases of irresponsible flying from time to time and do implore all aeromodellers to fly with care always, especially with power models. Let one and all make doubly sure that the present Home Office viewpoint remains unchanged for one single accident through one individual's carelessness can bring discredit and unnecessary restriction on our model flying.

THE " Speed King " is a typical racing type and certain design features may appear strange to the free flight endurance modeller.

A control line model requires longitudinal stability only. The plane cannot roll because of the control lines, therefore no dihedral is required. Furthermore, the directional path is predetermined by centrifugal force and the thrust line or rudder adjustment forcing the model away from the centre of the circle. The elimination of drag is, of course, essential. An engine cowl is required and the fin area is cut to a minimum because, as was previously mentioned, the flight path is fixed, thus requiring little fin area for directional stability. Landing gears are out ! Instead, a take-off dolly is used and the craft lands on a metal skid on its belly. The propeller should be arranged to stop in a horizontal position in order to prevent breakage. In order to squeeze out the last mile per hour, racing models require a glass-like finish ; the " Speed King " has been clocked at 103 m.p.h. One of the most important items is the propeller. It should be small in diameter with thin blades and have a high pitch. The propeller shown on the plan was used with the " McCoy ·49 " but each engine requires a different propeller design. It should allow the engine to run at a high r.p.m. in order to obtain maximum power. Spinners are essential for complete streamlining and propeller efficiency. Many speed modellers feel a knife-like streamline airfoil is required for speed but the opposite has been proven true. I have selected the 2412 airfoil, developed by the N.A.C.A. for the " Speed King ".

Fuselage Construction.

Select two straight grained blocks of hard balsa or sugar pine and cement them together along the horizontal centreline. Use very little cement as they must be prised apart later. Following standard solid model practice, saw out the plan view followed by the side view and then carve the fuselage to shape. When this is sanded smooth, pry the two halves apart and hollow to the lines shown on the plan. Be sure to allow a small platform-ledge for the engine mounts to rest on as shown in Section "AA". The next step is the attachment of the engine mounts using plenty of casein glue as the adhesive. When dry, the spar can be fitted in place using casein glue to hold it to the mounts. The interior should now receive two coats of alchohol resistant paint as is discussed under " Polishing ". The bell crank can now be cut out and attached to the spar. Ignition system may be installed at this time. A plug type battery was used on the author's model but four pen cell batteries connected in parallel-series have been used with great success. A switch is necessary in order to disconnect the flight batteries when starting with boosters.

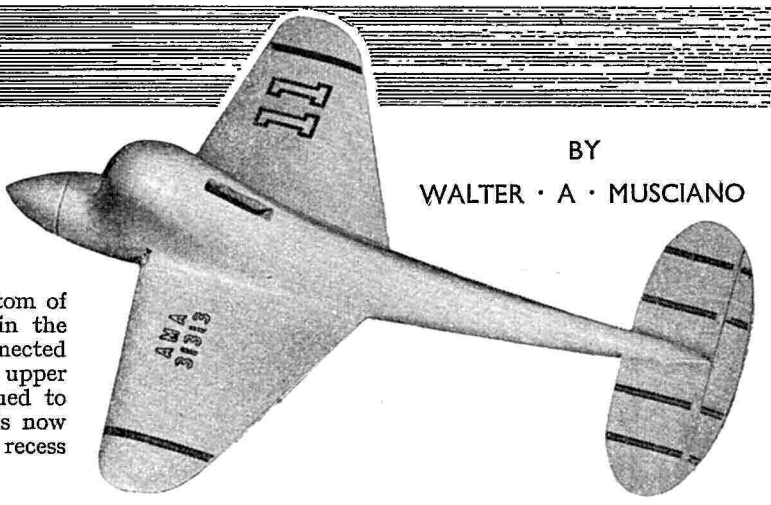
Wing Construction.

Cut the wing ribs from $\frac{1}{8}$" sheet balsa and attach to the spar in their proper location. The leading edge is cemented next. At this time bend the music wire lead-out lines and pass through the holes in the ribs. The wing is then covered with medium 1/16 sheet balsa. Be sure to bevel the trailing edge of the bottom covering before attaching the top in order to form a knife-like edge. Wing construction is completed with the addition of the solid balsa tips.

KING

BY

WALTER · A · MUSCIANO



Empennage.

Tail surfaces of 1/16" plywood have been found to give superior performance over thicker sectioned balsa or hardwood. Naturally, the edges are sanded to a fine edge. Hinges are made of crinoline and are well cemented to the top and the bottom of the other horizontal surfaces as shown in the sketch. When the controls have been connected and stabilizer cemented in place, the upper portion of the fuselage can be casein glued to the lower half. The metal landing skid is now screwed to the bottom of the fuselage in a recess cut for it.

Polishing.

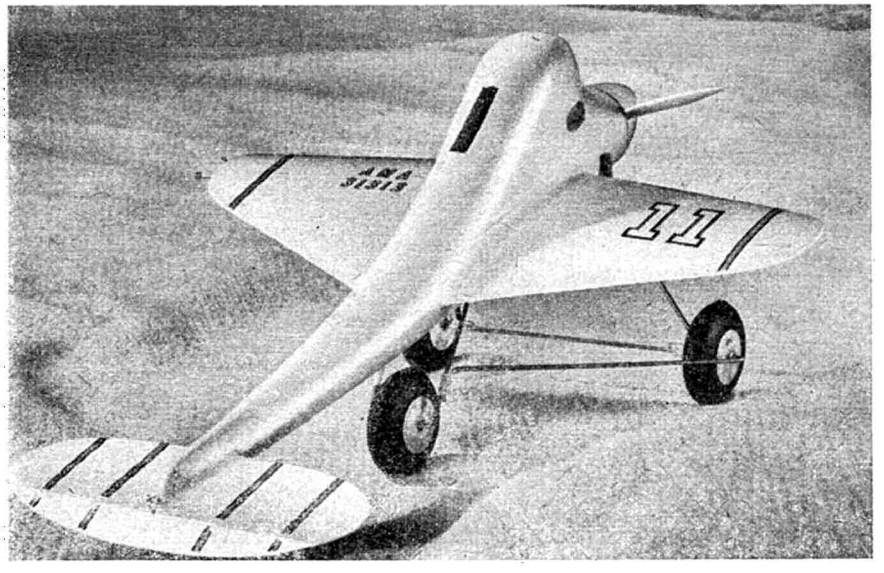
Now that the structure is completely sandpapered smooth, the finish can be applied. Dope the model twice and sand, then using a mixture of thin dope and talcum powder (creamy consistency) brush the entire model with intermittent fine sandings until a glass-like finish is obtained. Because of the nature of the " hot " fuel it will dissolve normal lacquer or dope finishes. Consequently another type of paint that is " alchohol proof " must be used. In the United States, automobile stripping enamel meets this requirement and I am sure an equally effective paint can be obtained elsewhere. The selected colour should be brushed on and left for at least forty-eight hours before being rubbed. An excellent rubbing compound can be made by mixing kitchen cleanser and Johnson's liquid floor wax. The more cleanser added the more the mixture's cutting power. A soft cloth is used for rubbing and a small area should be completed at a time. When a fine gloss has been obtained, a heavy polishing of simonizing paste wax adds the final lustre. The cowl-hatch can now be cut as well as the engine cooling slots.

Take-off Dolly.

Music wire is normally used for the take-off dolly however, any medium hard wire of about $\frac{1}{8}$" diameter can be used. The design can differ from the dolly on the plan as long as it is rigid and supports the model firmly. The joints should be wrapped with soft fine wire and well soldered. Wheels should be tracked to cause the dolly to follow the circumference of the flight circle. The larger the wheels the better.

Flying.

The balance point of the craft should be in line with the forward control wire. Shifting the batteries can correct any deviation from this point. As a safety measure, it is recommended that the flyer connect the control handle to his wrist with a leather thong in the event he becomes dizzy or for any other reason releases his grip on the handle. This will protect the spectators. Stainless steel stranded wire of ·016" diameter was used on the " Speed King ". Do not use fish line as it is not safe enough. The length of the flight lines is 56 feet. Test flights can be conducted using not less than three quarters engine power. Select a smooth surface for the flying site. When your helper releases the model do not attempt to zoom it off the dolly in a quarter lap. Instead use slight down elevator until the model has accumulated enough speed to become airborne by itself (approximately one lap) then gently lift it from the dolly. When flying keep your eyes on the model and not the ground, this will prevent dizziness. For maximum speed fly the model about ten feet above the ground. Because engine fuel consumptions vary it is difficult to specify the correct fuel tank capacity. A tank that contains about three minutes supply is ideal. It should be remembered that about twice the amount of alchohol fuels is consumed as compared to gasoline.



A $\frac{1}{4}$ scale plan is given overleaf. Full size drawings price 3/–, are available from Aeromodeller Plans Service, Allen House, Newarke Street, Leicester.

A 14" SPAN CONTROL LINE SPEED MODEL

SPEED KING.

DESIGNED BY
W. MUSCIANO.

3/-

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ALL WOODS SALED OTHERWISE STATED ARE BALSA

MATERIALS REQUIRED

STRIP
1 " OF 1/4 X 1/8 X 17" HARDWOOD
1 " " 1/4 X 1/16 BALSA
2 " " 1/8 X 1/8 X 3" SCRAP BALSA

SHEET
2 " OF 16 X 3" X 36" BALSA
1 " " 1/16 X 7" X 36"

MISCELLANEOUS
1 HARD BALSA BLOCK OR SUGAR PINE 2 3/4 X 3 3/4 X 2 1/2
2 STRIPS OF MAHOGANY 1/16 X 2 X 5/8
1 " " 1/16 X 1/8 X 9"
1 SHEET OF PLYWOOD 1/16 X 3 1/4 X 10"
1 ALUM SPINNER 2 1/4 DIA
1 PIECE OF 18 SWG DURAL 3/4 X 2 1/4

1 STRIP OF 16 SWG BRASS 3/8 X 18"
2 SOLID RUBBER WHEELS 3" DIA
1 " " " " 2 1/2"
1 STRIP OF CRINOLINE 1/4 X 10"
1 " 10 SWG WIRE 65" LONG
1 " " 16 " 20"
1 " " 18 " 2 1/2"
1 " " 20 " 24"

AMERICAN MCCOY 49 CU" IS SHOWN INSTALLED, BUT ANY 6 TO 10 CC PETROL ENGINE CAN BE SUBSTITUTED

PRESET POINTS & LOCK IN POSITION - REMOVE ARM

AIR INLET

AIR OUTLET

LARGE PRESS STUDS

CUT HATCH ON THIS LINE

18 SWG CONTROL HORN

BATTERY

SOLID WING TIPS

1 OUNCE FUEL TANK

COIL

ALUM SPINNER

BIND & SOLDER

BRASS WOOD SCREWS

3/8 X 1/2 ENGINE BEARERS MAHOGANY CEMENT TO FUSELAGE

18 SWG PUSH ROD

1/8 THICK BRASS SKID 1/8" WIDE

CARVE FUSELAGE FROM SUGAR PINE OR HARD BALSA

NOTCH BEARERS TO FIT SPARS

2" DIA REAR WHEEL

WRAP WITH FRICTION TAPE

TAKE OFF DOLLY CONSTRUCTED FROM 10 SWG PIANO WIRE

2" DIA FRONT WHEELS 2 OFF

BIND & SOLDER

WING COVERED WITH 1/16 SHEET. WING HAS 1/8 TRAILING EDGE

SMALL PRESS STUDS

HATCH SHOWN REMOVED

TAIL PLANE & ELEVATOR FROM 1/16 PLYWOOD

LARGE PRESS STUDS

CARVE FUSELAGE FROM SUGAR PINE OR HARD BALSA

PERSPECTIVE OF TAKE-OFF DOLLY

BIND & CEMENT CONTROL HORN TO ELEVATOR

DRILL TO TAKE 3/32 DIA MACHINE SCREW

20 SWG LEAD-OUT WIRES

ENGINE BEARERS

BEND PUSH ROD AROUND BATTERY

POINTS

GROUND

HIGH TENSION

CONDENSER

BOOSTER

BOOSTER

SWITCH

PLUG-IN TYPE BATTERY

16 SWG DURAL SHEET BELL-CRANK

SCRAP BALSA FILLETS

COOLING SLOT

WIRING DIAGRAM FOR PETROL ENGINE

TOP SHEETING ON PORT WING OMITTED FOR CLARITY

BELL CRANK

NUT, SOLDER TO SCREW

1/8 THICK NUT

ALL WING RIBS FROM 1/8 SHEET

1/60 LB

3/32 DIA MACHINE SCREW

DRILL N° 50

ALL RADII 3/16

DRILL N° 60

DRILL N° 40

CRINOLINE HINGES

1/16 O/D ALUMINIUM TUBING

LOCATE ENGINE BEARERS TO SUIT ENGINE USED

CUT AWAY FOR BELL CRANK

BIND WITH FUSE WIRE & SOLDER

WING SPAR 1/4" HARDWOOD SHEET

DRILL TO SUIT ENGINE

CL 284

FACTUALITIES

PART IV BY JOHN HALIFAX

Angular Andy. *A "Flying Axe" design by the author of this article. The friend, Mrs. "B." Parsons, is notable for low altitude appearances at Eaton Bray in a Tiger Moth, and the model for the large "forward fin" mentioned in the article. Both fly very stably!*

THE Theorist's views on stability are apt to be rather complicated, and this is especially true of Lateral Stability, since it is concerned with three separate but related types of motion, but reduced to "cause and effect" there is nothing in it.

The three different forms can best be seen when a model is towed up on an ordinary sailplane towline, since it is then in its most sensitive state.

Oscillatory Instability (Fig. 1). In free flight this form of instability results in the well-known "Dutch-Roll", and is due to the dihedralled wings being more effective than the fin in a gust.

Cure. Increase fin area or reduce dihedral angle. The first solution is preferable, since reducing the dihedral angle may lead to:

Spiral Instability (Fig. 2). Broadly speaking, this is the converse of the form above and is mainly due to insufficient dihedral: the obvious cure is to increase it, but other aids may be tried.

Cures. Increase dihedral as mentioned, but if this causes the first form of instability, the following aids may prove effective:

"Washout" wing tips.
Erect a "forward fin" (see accompanying photo).
Reduce fin area (ineffective unless the model has a large forward fin and a minimum of dihedral).

Instability under Power. If a model has a very powerful motor it is quite possible to stall the fin during the "powered sideslip" common to such. Thus torque should *always* be counteracted by side thrust.

It is interesting to note that at least half the "cures" above were developed from theoretical considerations before being tried out in practice. A full account is given in L.S.A.R.A. report No. 6, Part 1, by N. K. Walker.

Pitching Stability. This is more usually known as Longitudinal Stability, and to achieve it three things are essential.

1. The Centre of Gravity (i.e. the point at which the model balances) must be between a quarter and a third of the way back from the wing leading edge. It can be further back, of course, but the machine will take much longer in getting out of awkward attitudes; in a stall, for instance, much more height will be lost than would have been the case with the C.G. well forward. Thus although the Lift/Drag ratio is likely to be slightly lower, the actual performance will not suffer at all in actual practice.

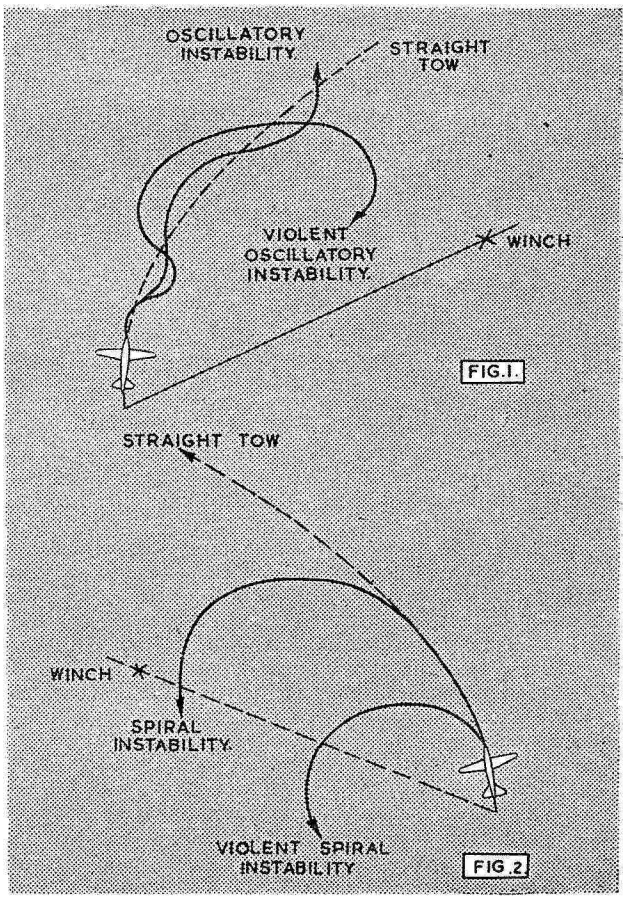
2. The tailplane area must be sufficient for the model. For rubber models, the tailplane area as a fraction of the wing area is given by:

$$\frac{\text{MEAN CHORD}}{\text{MOMENT ARM}}$$

where the moment arm is the distance between the C.G. and a point one quarter of the way back from the tailplane leading edge. (For gliders, three quarters of this value should be taken—see Aerodynamic Design, Pt. 14.

3. The rear of the fuselage and the tail unit must be kept as light as possible, consistent with strength, and the nose should be not unduly long. In other words, concentrate as much of the machine's weight round the C.G. as possible.

The tailplane section should be a flat plate for small and medium sized models, and a thin symmetrical one for larger models. This is not, as some people seem to think, because there is something intrinsically wrong with thick sections but because thin ones have a much better performance at model speeds. On a *very* large machine R.A.F. 30 could be used with excellent results, but for ordinary models its performance would be very poor.



Report of the MODEL COMMISSION of the F.A.I.

HELD AT GENEVA IN SEPTEMBER, 1947.

THE Model Commission of the F.A.I. was able to carry out a considerable amount of work during the two days available and settle the outstanding points from the previous conference. It is felt that the revised regulations are not only more logical, but provide greater freedom of design and will, therefore, be conducive to more rapid progress.

The system of defining the size of models by reference to the total area of all horizontal flying surfaces (decided upon at the last Conference) was confirmed, and the limiting maximum area of 150 square centimetres (16·14 square ft.) fixed. Designers can, therefore, dispose the available area between the main supporting surfaces and auxiliary supporting surfaces in any proportion they desire, and the "Tailless" Model no longer suffers from the handicap inflicted under the old rules. The 33% tailplane area rule has been deleted.

The restriction limiting the minimum size of a model has been abandoned as unnecessary.

The logical scheme of relating all other characteristics of the model to the total area of all its horizontal flying surfaces was also decided upon so that the loading and fuselage cross section are functions of the total area.

As a result the minimum loading of 12 grammes per square decimetre (3·93 ozs. per sq. foot) taking into account all the horizontal surfaces was fixed, the original maximum loading of 50 grammes per square decimetre (16.4 oz. per square foot) being retained. This results in a slightly lower minimum loading than under the old rule, so that existing models to F.A.I. specifications are unaffected. The maximum weight rule of 5 kilogrammes (11·023 lbs.) was retained.

The loading restrictions are to apply to all models except indoor models and special types (such as Helicopters) and not merely to Motor-driven models as originally.

The fuselage formula for Gliders was fixed as 1/100 of the total area of all horizontal surfaces, and that for Rubber and Power-driven Models as 1/80 of the total area of all the horizontal surfaces. These effect a considerable reduction in the fuselage cross-sectional area in most cases and bring many more existing machines within the F.A.I. regulations.

No fuselage restriction is to be enforced on Tailless machines or on Autogiros or Helicopters.

As the area of the surfaces will in future be the defining factor of the machine's characteristics the method of measuring their area received the close attention of the Meeting as this, naturally, now assumes considerable importance.

It was finally decided to adopt the recommendations of the Conference held in Sweden, namely:— The projected area of the surface on to the horizontal plane, the area to include the complete centre section (body or fuselage see Fig. 1) the normal wing contours being continued until they meet the plane of symmetry in plan view. This overcomes the difficulty of defining which is centre section and which is fuselage, and conforms with accepted aircraft design practice (see Fig. 2).

A discussion on the question of defining the area of Autogiros and Helicopters led to a decision to take the area swept by the rotors as their area, but it was agreed that under present conditions of development it was not advisable to apply any loading limits to machines of this class. It was agreed that the 5 kilogrammes (11 lb.) total weight restrictions would suffice until such models have advanced considerably in their development.

The use of the inscribed circle for defining the area of the maximum cross section of the fuselage in complicated cases (established at the London Conference) was confirmed, but it should be made clear that its use applies to cases of special difficulty only. Normal cases using square, circular, oval or rectangular fuselages, where the cross section is obvious, are not to be computed by this method.

The clashing of International Events and the running of unauthorised events advertised as International by their sponsors came under discussion, and it was agreed that an F.A.I. Calendar of approved Model Events should be established forthwith to avoid clashing and give direction to aeromodellers regarding approved "International" events as distinct from those sponsored by Commercial concerns or enterprises. The general opinion of the Meeting was that all events for inclusion in the Calendar should be sent by the National Aero Clubs so as to reach the F.A.I. Secretarial Office in Paris before January 1st 1948, where the Calendar would be established at the Meeting of the General Council in the latter part of January. The general feeling of the Meeting was that the number of approved International Events should be strictly limited to reduce the strain of travelling particularly under present conditions.

The advisability of revising the qualifying flights required for the issue of F.A.I. Model Certificates in view of the developments which have taken place during the War period, and to unify the qualifications in all countries, was discussed. The existing qualifications in various countries were examined and the decision made to recommend strongly to all National Aero Clubs the adoption of the following qualifying flights.

Gliders, Rubber-Driven Models, and Models driven by Mechanical Motors.

A. Certificate. 3 flights of more than 60 secs. in each of two categories.

B. Certificate. 3 flights of more than 2 mins. in each of two categories.

C. Certificate. 3 flights of more than 3 mins. in all three categories.

In the case of Gliders the launching line length is to be limited to 100 metres maximum (329 ft.).

In the case of Models driven by Mechanical Motors the motor run must not exceed 30 seconds.

Note:—To qualify for A or B certificates the aeromodeller *must* qualify with any two of the three categories of model.

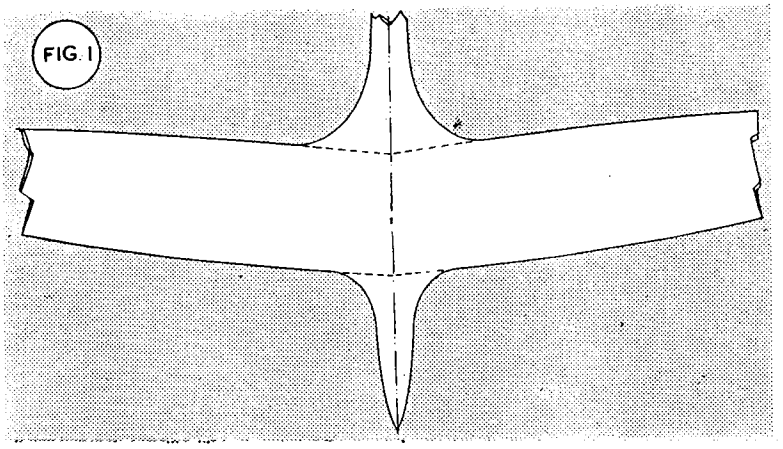
To qualify for the C certificate the aeromodeller *must* qualify with all three categories of model (namely Glider, Power and Rubber).

Qualifying flights in each category of model (either Glider. Power or Rubber) must be carried out with the same model, flown by the builder, and they must be made on the same day, but flights in the different categories may be carried out on different days within a period of one year (see Fig. 2).

As before, the Class "C" Certificate is the only one receiving official F.A.I. recognition, the other two "A" and "B", having only National approval.

Adoption of these qualifying tests by all countries will enable the prowess of aeromodellers in various countries to be assessed on a common basis.

The question of International Badges for issue to holders of Certificates on parallel lines to those used in the gliding movement was discussed but was left over pending the preparation of suitable design. The revision of the Model Aeroplane Rules in the Code Sportif of the F.A.I. in the light of the above discussions, other developments, and modifications suggested by France, was then discussed and most of the alterations made in the French draft were approved.



These include :—

1. A new definition of a " Model Aeroplane " to meet the altered condition arising from the development of pilotless missiles during the War period.

2. The inclusion of a new record class for " Special Models " (Autogiros, Helicopters, etc.).

3. Up to date definitions for all classes of Models.

4. The requirements of permits for speed record attempts, and the necessity of providing suitable safeguards.

5. Limitation of the length of cable for Glider Launching to 100 metres maximum.

6. A ruling that in the case of Gliders, competing aeromodellers (who must also be the builder) must operate the launching device.

7. The competing aeromodellers in the case of Gliders are permitted unlimited freedom of movement to enable them to use the launching line to its maximum advantage.

8. The introduction of a reasonable specification for watches used for the timing of record flights.

9. The introduction of modified margins necessary to beat existing records.

10. The introduction of modified conditions in the establishment of records.

International Contests.

The question of International Contests received the attention of the Meeting as it was felt that some measure of standardisation of conditions was advisable.

The following points were agreed upon for all International Contests:—

(*a*) The number of flights to be three.

(*b*) The total results of the three flights to count for points.

(*c*) In the case of Power models the engine run must not exceed 20 secs. Flights in excess of 20 secs. to lead to disqualification.

(*d*) Only one model should be allowed each competitor during the contest.

(*e*) Only one false start to be permitted.

(*f*) Competitors in Glider Events to supply their own lines.

(*g*) The order of starting is to be by draw.

(*h*) Maximum of 10 minutes grace to be allowed competitors between the time they are called for a flight to the time they present themselves to the Jury for the flight.

(*i*) Recommended that organising countries make arrangements with their customs for the passage of models. The F.A.I. to go into the question of a standardised customs form.

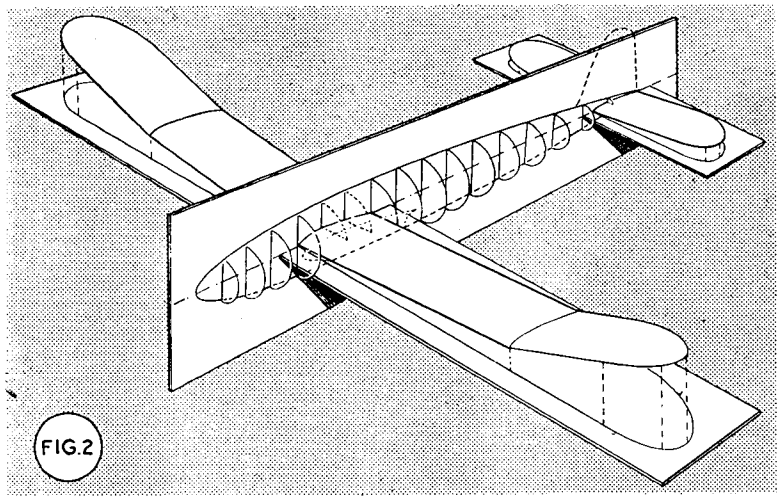
(*j*) The organising country must make adequate provision for retrieving the models, owing to the language and geography difficulties of visiting competitors.

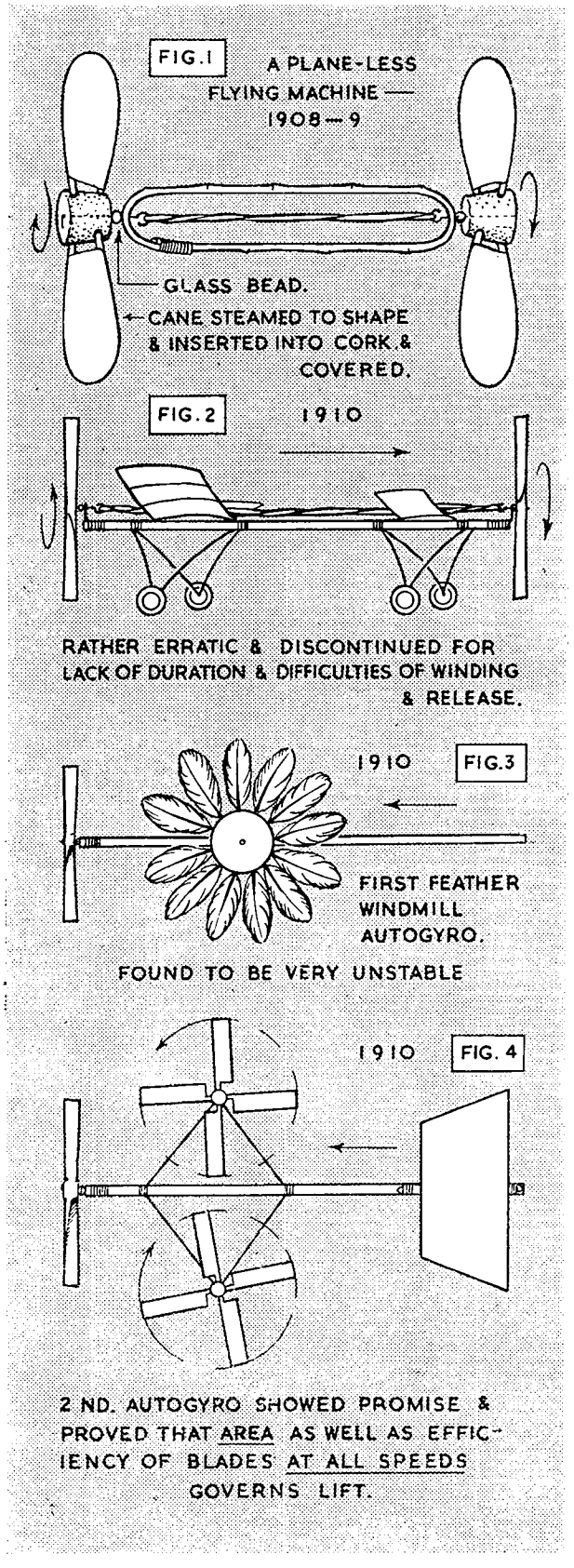
(*k*) All models to bear the name and address of the contestor and of the National Aero Club.

(*l*) That money prizes should not be given in International Contests, but only trophies, medals, etc.

It is felt that adherence to these conditions by all National Aero Clubs will greatly increase the popularity of International Events and avoid the disappointment arising from the encounter of unexpected conditions.

The Main Conference agreed that the above new and modified regulations should come into effect as from January 1st, 1948.





• A PIONEER'S

BY HAROLD

MY earliest models, manufactured from odds and ends from 1904–08, all flew—successfully and otherwise! In 1909 I began an association with the late Frank Smith, also of Worcester, whose house at Brick Barns Farm was the scene of literally thousands of early model flights, of every type and description. Incidentally, his photo appeared in the September 1945 AEROMODELLER with my own and others of the club, in the article by Mr. Pollard, who was a fellow clubman at that time. My activities in 1909 were mainly directed towards providing wings for rockets to attain rocket driven flights, to arrow and feather-windmill types of model (the latter being both the power-driven rotary vane type with port and starboard multi-bladed feather rotors to replace wings, and the auto-rotating type with the same feather arrangement but propelled by an ordinary rubber motor and propeller, the rotors windmilling in opposite directions) and also clockwork and electric driven models.

These were more cumbersome than the rubber-driven A–frame and flying stick types, and I carried on with different models of three main types as the transport problems attached to these earlier models were too great (five miles to the Farm—on a cycle that had solid tyres, no freewheel, one front brake that worked by pressing *down* on the front tyre—and a candle lamp, which on the night journey home over rutted country roads required two boxes of matches to keep it alight!). The three main types were as follows: (1) Tractor monoplanes or biplanes, with bamboo rod fuselage and wire landing chassis with central bamboo skid for rigidity; (2) "A"–frame twin-screw pushers—large size for duration work and a smaller for "racer" work and "Golf Circuits" (in which the plane was directed towards three successive holes about 150 to 250 yards apart to give a triangular course and where absolute control of direction and distance of flight was essential to obtain the required manœuvre). The "A"–frame of these models was often replaced by a "T" frame, but personally I preferred the "A" as it stood up to the wear and tear rather better. (3) This was the single-screw pusher type, varying in size from 1 ft. in length to 5 ft. or even 6 ft. in length. My 1 ft. size, all fliers by the way, with wooden wings and elevators, were sold in two shops in Worcester and also at Barry Island—probably the first mass production of model planes in this country. The larger sizes was one with which I had many excellent duration flights over a period of years and which, manufactured by Frank and myself to order (with the tractor monoplanes) enabled many schoolboys to enjoy model flying when they themselves were unable to make a model that would fly.

My tractor mono won the duration prize (5/- cash!) on Gorse Hill ground after having broken its back during trial flights the day before the competition. Spliced, its usual bamboo rod fuselage of those days was about 6 in. to 8 in. shorter than when the competition started, but it was still good enough to capture first prize! I flew it in its "repaired" condition for many weeks after the contest without trouble—it really was a good old machine.

Some of the old machines from which we derived so much amusement are illustrated here—Fig. 1 for instance shows what would today be termed a helicopter, but in those days I termed a "plane-less flying machine".

SCRAPBOOK •

WHITAKER

The airscrews rotate in opposite directions and the model flew until the motor unwound.

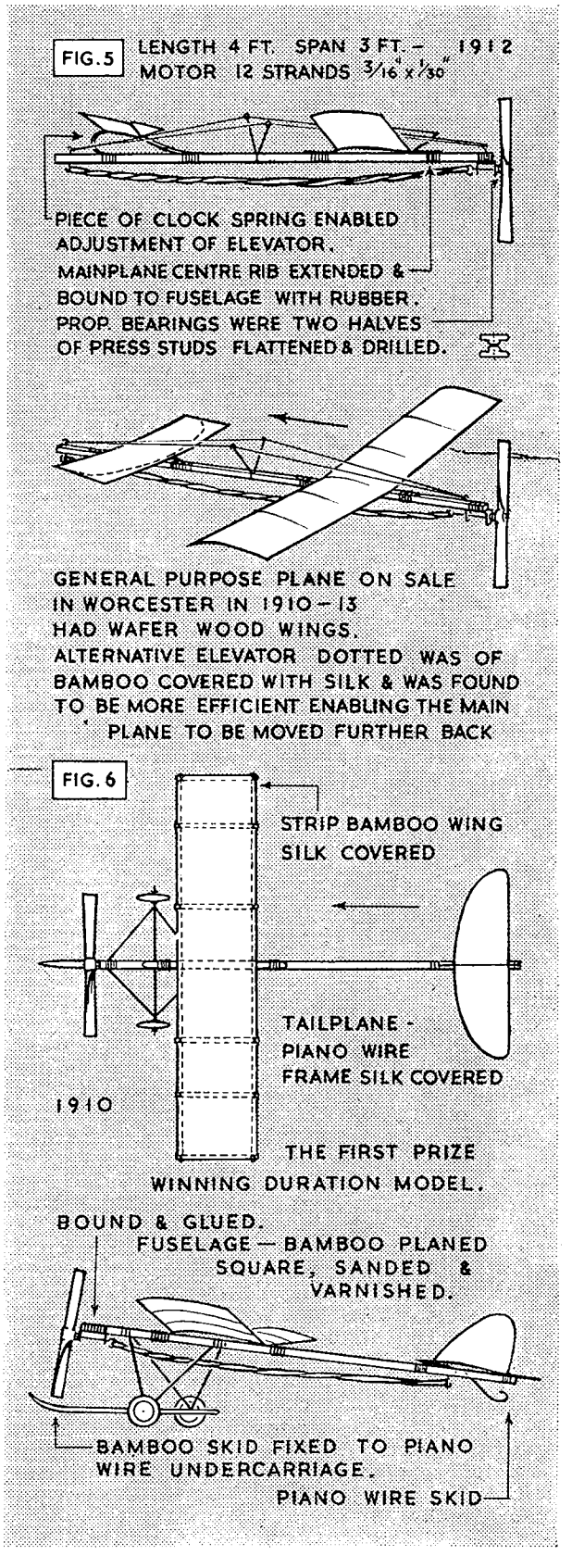
1910 saw a development of this machine (Fig. 2) which was not highly successful, flight being erratic, and the model was abandoned owing to lack of duration and the difficulty of releasing the two airscrews simultaneously—to say nothing of the fun involved in trying to wind it up! Another 1910 effort that was discarded was the feather windmill autogyro in Fig. 3 being too unstable.

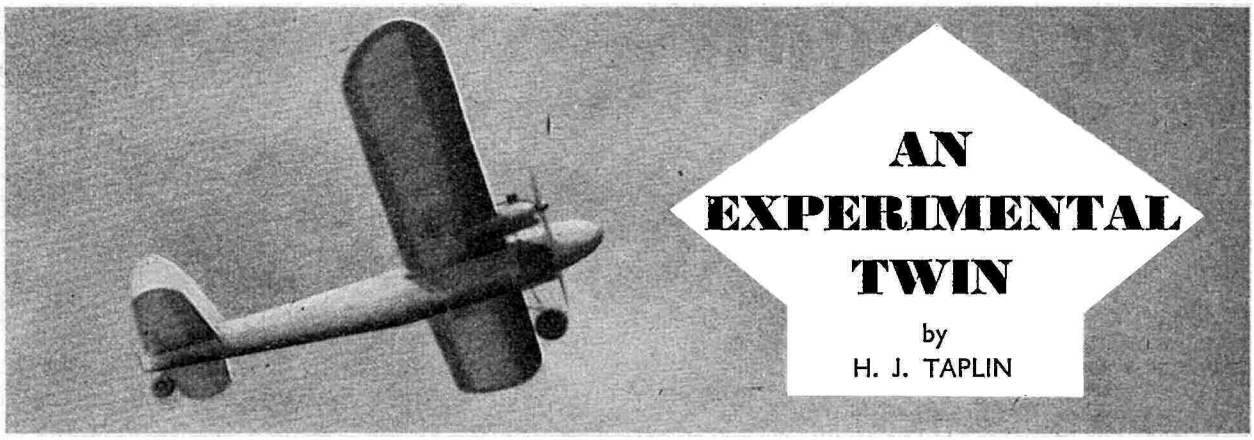
A rough specimen of Fig. 4 showed considerable promise, and provided the interesting proof that the area of the blades at all speeds governed lift as well as the efficiency of the blades. This was apparent from the rotation of the blades when the machine was drawn through the air.

The single screw pusher illustrated in Fig. 5 was a standard type with variations in use from 1909 to 1913. Average span was 3 ft. with a length of 4 ft., although models were made and flown as small as 1 ft. in length. With "wooden wafer" planes these were sold in the shops mentioned before, and were also made to order—often my machine of the moment was sold after having been seen in flight by the interested prospective buyer! Two types of elevator were used, a silk covered type and the "wooden wafer" type as on the "commercial" models. Piano wire king-posts were fitted amidships, holding wire strainers which prevented the stick fuselage whipping under the strain of the fully wound rubber motor. The elevator mount and the elevator were fixed-bound and glued in place—but the wing was held on the fuselage by rubber bands over an extension of the central rib.

My first prize-winning machine is illustrated in Fig. 6. Note how the ribs were often unevenly spaced in these earlier models, a wangle to regain lateral balance upset by the varying weight of bamboo splits! The span was approximately 3 ft. with a length of 3 ft. 6 in., the motor turning an 11 in. prop whose shaft ran in a brass strip bearing bound to the fuselage stick with cotton and glued, with press stud thrust washers. A word on the method of covering may be of interest—the silk was sewn on, the piece having about ½ in. overlap all round which was folded over and first sewn (running stitch) along the leading edge, then along the trailing edge, and finally at both the ends after tightly stretching to make the whole drum tight. The tailplane was made from piano wire bent to shape and bound and glued, the whole when covered in the same way as the mainplane being lashed to the fuselage stick at the rear. The fin was also made from wire, two extensions of the outline being left to plug into holes in the fuselage stick.

The R.O.G. performance of this machine was quite good, owing to the rigidity of the undercarriage, and it was often used in my home street to show intending purchases of similar models that it did "rise off the ground under its own power" like a real aeroplane—which resulted not surprisingly in frequent encounters with trees and houses in the vicinity! Competition flights were hand-launched, though R.O.G. work was occasionally done—off a strip of "landing lino!" It used to be a great occasion if a model maintained a straight run for long enough to get off the strip of ersatz tarmac; many of them did, though more did not!





AN EXPERIMENTAL TWIN

by H. J. TAPLIN

WITH the development of the model petrol aeroplane engine, and in recent days the compression-ignition engine, model aeroplane flying has developed very rapidly, and many and varied are the types of machines to be seen at any of the big meetings.

Up-to-date, however, they practically all have one thing in common whether petrol driven, Diesel, or for that matter rubber—they have but a single air-screw, and the torque exerted by a single propeller on a model aeroplane gives much food for thought to most aero-modellists and although various schemes have been adopted to overcome this, nevertheless the menace still remains.

As every experienced aero-modellist knows, the torque of the propeller tends to turn the machine in the opposite direction and although the power unit may be offset to the line of flight to neutralise this, another menace is always present at any rate on power machines, that is the centrifugal effect caused by the propeller. For example, an anti-clockwise rotating propeller tends to turn the model into a left-handed turn and whilst this may be counteracted either by rudder or by offsetting the engine to the right, the overdoing of this correction to cause even the slightest right-hand turn will in nearly all cases end in disaster, owing to the gyroscopic effect of the propeller pulling the machine into an ever-increasing turn until it finally spins into the "deck." The aim therefore is to eliminate this single propeller torque.

It will be obvious that this can be done by using two propellers rotating in opposite directions. The difficulty, however, of operating a power machine with two engines is the variation of engine speed (and consequently variation of thrust), and even worse the cutting out of one engine while the machine is in flight.

In the machine which is about to be described this latter difficulty has been overcome by synchronising both engines by means of a cross-shaft coupled by gears to each engine. By such a system the engines run independently of each other, and once they are running and tuned, the cross-shaft does no more work than synchronise any variation in speed, keeping the thrust constant.

The engines used in this particular case were 1·3 c.c. Diesels, and with such small engines, one of the most important points to be considered is to eliminate as far as possible any friction from the gearings or the bearings, but at the same time making it strong enough to take the "jolt" of one engine starting up first and endeavouring to drive the other one.

The machine which the writer has designed and flown has a span of 6 ft. 6 ins. a cord of 10 ins., and overall length of 3 ft. 7 ins. and its total weight is 3½ lbs.

The units comprising the gearing for each engine, are a pair of 2/1 brass bevel gears, a split duralumin housing which clamps over the engine nose, the bottom half of which forms a platform upon which is mounted the cross-shaft SKFCO self-contained ball race bearing. The large gear wheel is mounted direct on to the engine crank-shaft and provided with two holes that engage the driving pegs on the engine propeller boss. A special crank-shaft extension piece is provided in order to give the propeller a sufficient clearance from the gearing. The large gear wheel is held against its work rather like a washer, by means of the tightening of the propeller with a conical nut. The cross-shaft, as previously mentioned, is carried in a SKFCO self-contained ball race of 4 mm. bore and is housed in a split housing which screws direct on to the extension of the engine housing. The small gearwheel is pinned on to the cross shaft at the engine side of the bearing. The engine housing is made slightly less than the total length of the nose in order to allow adjustment for engaging the gears correctly in mesh, the cross-shaft projecting through to the other engine with exactly the same gear mounting.

In practice, it has been found advisable to provide a further ball-bearing plummer block in the centre of the shaft in order to prevent whip of the shaft, since the cross-shaft is travelling twice the engine speed. By this arrangement of gearing it will be seen that the propellers rotate in opposite directions.

In order to put the minimum of strain on the cross-shaft and the gearing, the engines are carefully timed to fire at exactly the same time. If this were not done it would be seen that impulses would be transmitted alternately from each engine through the shaft. It is obvious that all this gearing, bearings, etc., must be carefully lined-up to avoid friction.

Starting the engine up.

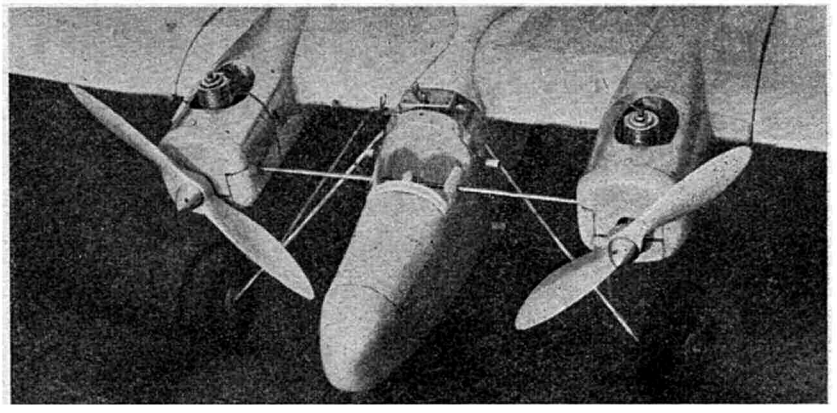
Before coupling up the engines with the gears, each engine should be run and a careful note taken of the position of compression and needle valve for starting. When this is established the engines may be interconnected through the gearing.

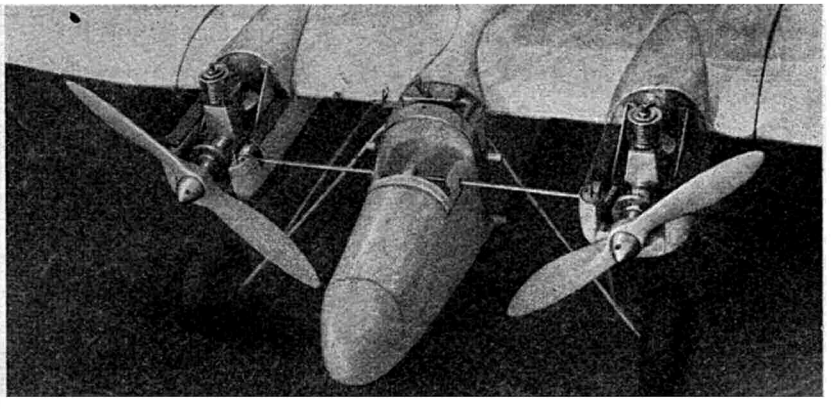
It has been found that with engines of this size, one engine will not drive the other, but they must both fire

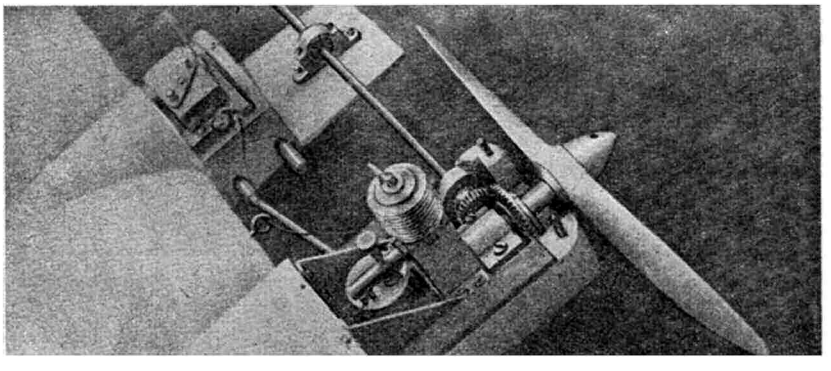
together in order to run, consequently the timer need operate on one engine only.

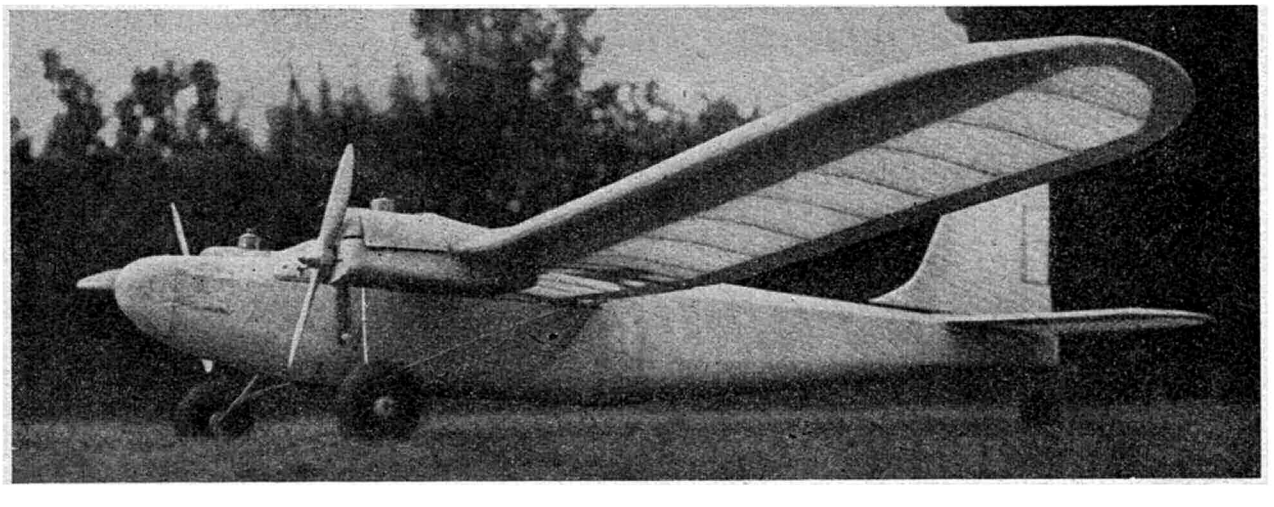
Having coupled the engines up, each engine should be primed by sucking in the number of times that it is found suits each engine best. The starting is then done on one propeller (which automatically rotates the other one). It will usually be found that one engine fires a few times before the other one chimes in, and once they are both running, final adjustments can be made to each throttle and compression as previously ascertained. In practice, with accurately made gearing, and bearings, it will be found that very little power is lost. In the machine to which we are referring the static thrust on each engine was measured at ten ounces, the two engines running together giving about 19 ounces. With a machine weighing 3½ lbs. this is found sufficient for the machine to rise quite easily R.O.G. and to climb steadily, although not unduly fast. The actual flying of the machine leaves nothing to be desired. Its direction of flight, either straight or in a right or left-handed turn, remains constant whether the engines are running, or when the machine is gliding, and steep turns, either right or left, may be carried out without fear of spinning.

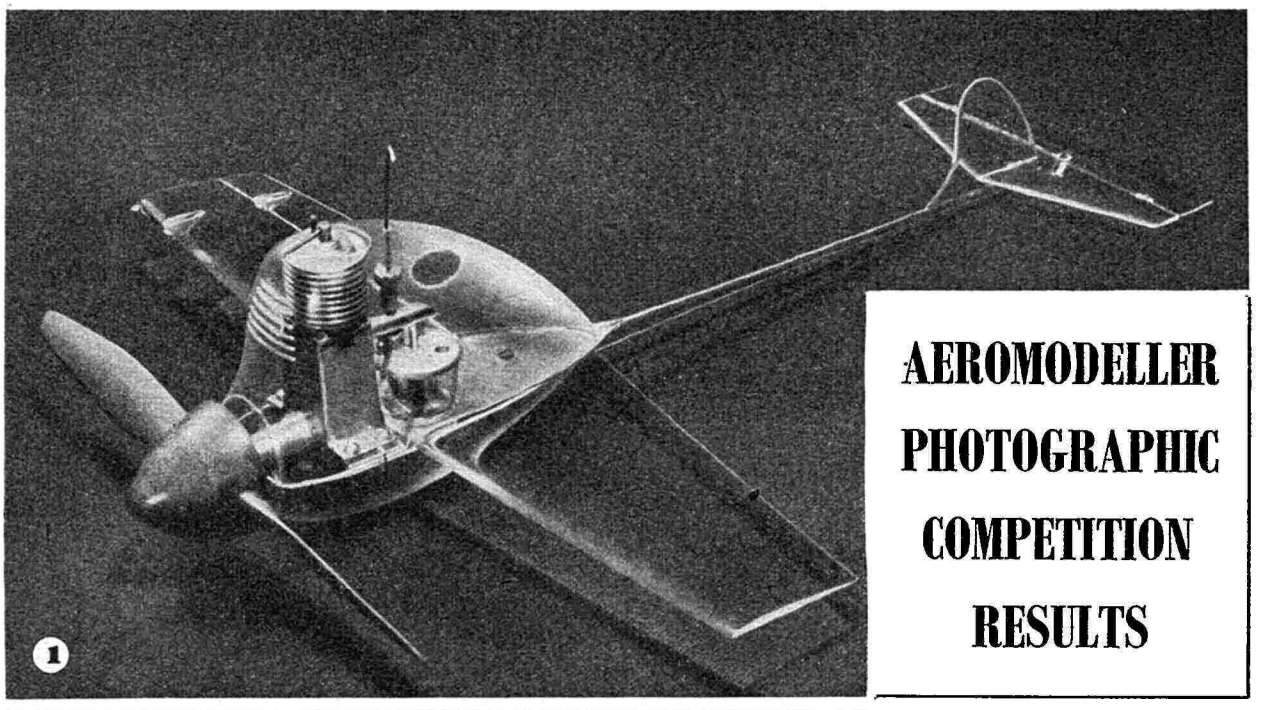
As many readers may possibly know, the writer is particularly interested in controlled manœuvres carried out by means of cams, and whilst much work has been done in controlling single-engine machines in flight, the twin-engine machine with its absence of torque vices, lends itself admirably for controlled flight. Space, however, does not permit me to enlarge on this subject, but at some future date the opportunity may arise for further details of this most interesting side of model power flying.



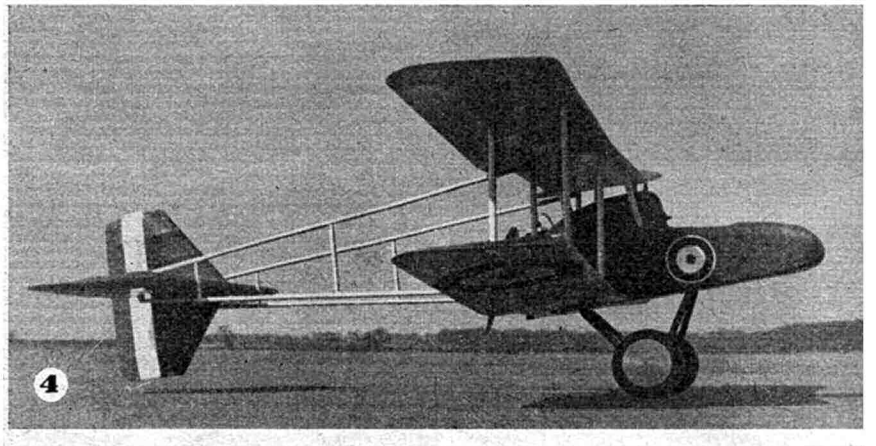


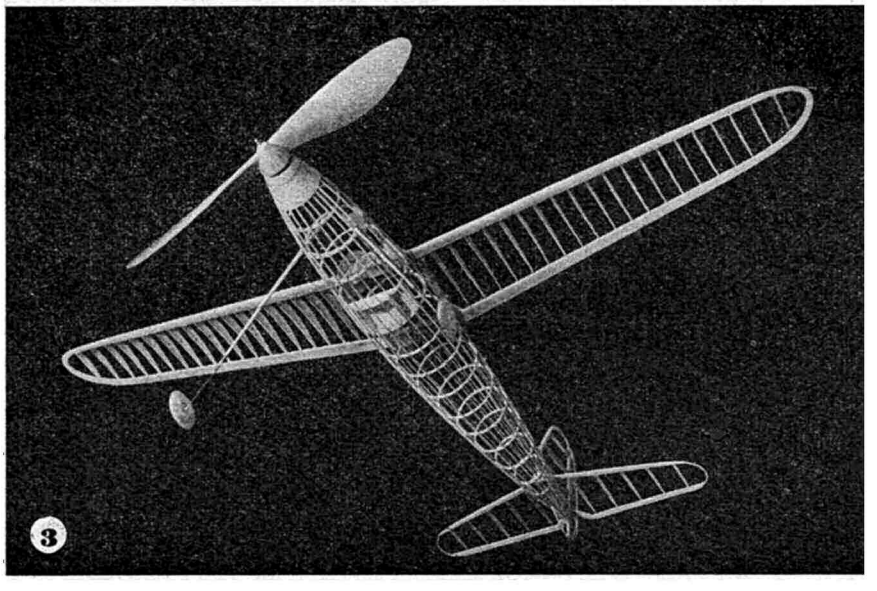






AEROMODELLER PHOTOGRAPHIC COMPETITION RESULTS





WE were more than gratified at the response to this competition, and it was at once apparent that our readers are as handy with their cameras as they are with the balsa cement. In fact the judges decided that in view of the general high standard of the majority of entries, additional prizes of 20/– should be awarded to the runners up in each section. It was also decided to make a special award to Mr. G. D. Miles for a set of exceptionally fine photographs of a most unusual model. We have used one as a heading to this display of the winners and hope to publish in a later issue further photos, together with a general description and constructional details of this unique model. The runners up will be featured next month and we feel sure that readers will join with us in congratulating the successful entrants on the high standard of their photography and model building.

SPECIAL AWARD

(*Photo* 1.)

G. D. Miles,
704a, Kenton Road,
Kenton, Harrow,
Middlesex.

"Perspex Model"

SOLID SCALE MODELS

Section A. (*Photo* 2.)

1st. J. P. Jeffries,
17, Tennyson Road,
Hounslow East, Middlesex.
"Fairey Seafox"

2nd. P. van de Dyk,
Utrecht, Holland.
"P. 80A Shooting Star"

RUBBER DRIVEN DURATION MODELS

Section B. (*Photo* 3.)

1st. A. Morrin,
Berkeley Hotel,
London, W.1.
"Copland Wakefield"

2nd. W. R. Ormerod,
3, The Crescent, Tettenhall
Wood, Nr. Wolverhampton.
"Free Lance Wakefield"

FLYING SCALE MODELS

Section C. (*Photo* 4.)

1st. W. R. Ormerod,
3, The Crescent, Tettenhall
Wood, Nr. Wolverhampton.
"F.E.8"

2nd. D. H. Elmes,
13, Quebec Road, Ilford,
Essex.
"Ryan P.T-16"

GLIDERS AND SAILPLANES

Section D. (*Photo* 5.)

1st. J. Marsh,
140, East Park Road,
Leicester.

2nd. D. R. Hughes,
339, Upton Road,
Nottorum, Birkenhead.

POWER DRIVEN MODELS

Section E. (*Photo* 6.)

1st. D. P. Golding,
517, Foots Cray Road, New
Eltham, S.E.9.
"Purists Plea"

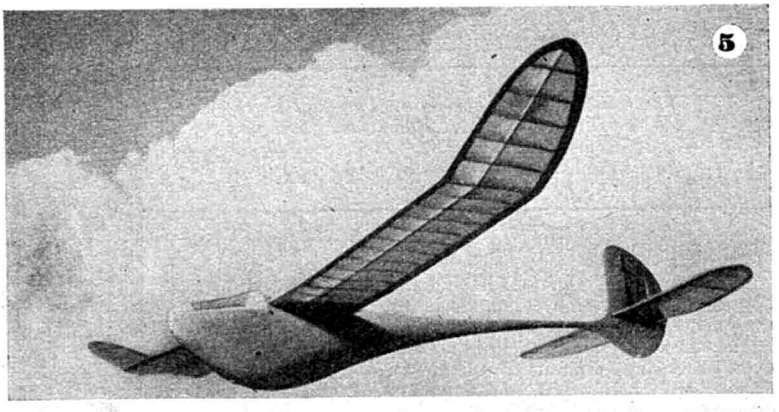
2nd. J. Pearson Evans,
6, Vesey Place,
Dun Laoghair, Co. Dublin.
"Taylorcraft"

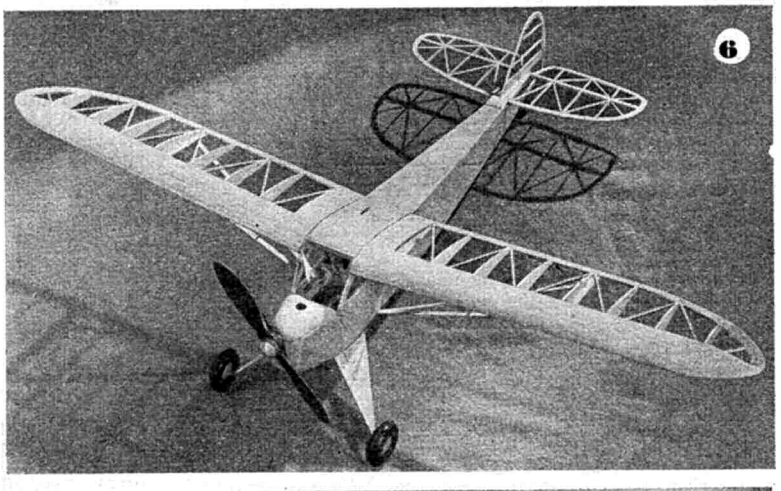
ACTION SHOTS

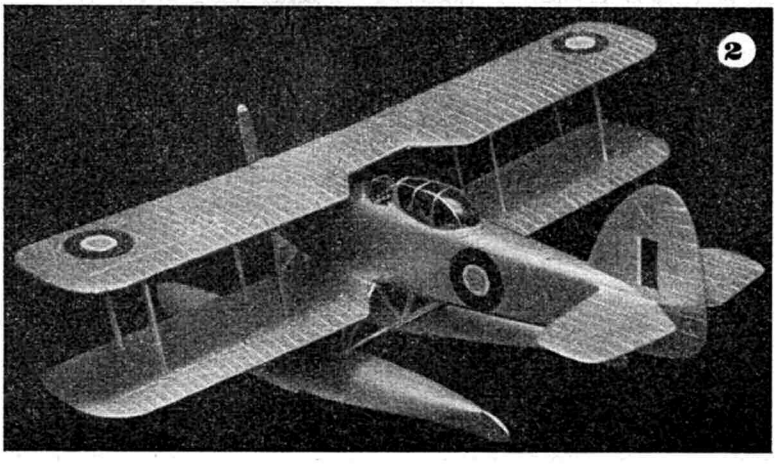
Section F. (*Photo* 7.)

1st. W. Titterington,
17, Brownlea Avenue,
Dukinfield, Cheshire.

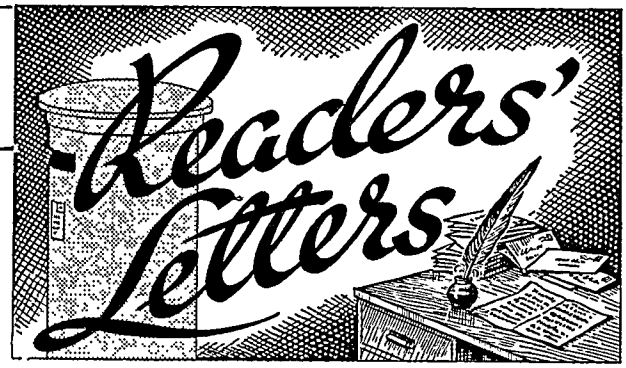
2nd. J. A. Priest,
21, Beeches Avenue,
Carshalton, Surrey.







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



DEAR SIR,

There are many good i/c engines manufactured in this country, but what on earth (or in the air) have they been designed for ? The pre-war series of unimaginative miniature engines is with us once again, and added to it is a new, and ever increasing, stream of the most dreary diesel engines. (What an opportunity have the makers of diesels—with a few exceptions—missed !)

The motors themselves may be good, but Heavens ! the inaccessibility of the controls. Why not put the contact-breaker at the rear and give it a long arm ? Why not bend the induction pipe so that those of us who are not double-jointed can place a finger over it ? Why not put the throttle where it can be got at without the aid of a pair of long-nosed pliers ? Why not put a long neck on the filler ? Why should we, the customers, have to solder extensions onto practically the entire engine ? And why don't manufacturers get down to it, and start showing some sparks of originality and common sense ?

All diesels should have built-in cut-outs ; measuring the fuel beforehand is a quite inaccurate method for patently obvious reasons—and the makers should know it.

Finally, what about the exhaust apertures which unload their filthy sludge all over the carburetter and the front bulkhead ? Short stubs would help to remove this public nuisance, but how many manufacturers—especially of diesels —fit them ?

I hope that some designer of engines, who is sufficiently interested in model aircraft to read the AEROMODELLER will reply to this letter. I hope, too, that he won't start off by saying that the public gets the engine it deserves. Other, and more famous people have said that the public gets the newspapers it deserves. But does it ? Certainly not !

P.S.—I see that American engine prices are being cut by anything up to 40 per cent. I see, also, that CO_2 motors over there run on soda-siphon cartridges.

Liphook, Hants. STANHOPE KENNY.

DEAR SIR,

I just glanced through the AEROMODELLER and thought I'd compare the prices of the engines with those in America. I was astounded at the difference. Let's take the Ohlsson 19 which is selling in America at $9·95—the dollar is approx. 5/- therefore the price in pounds is £2. 10s. Ohlsson 23 $9·95 (£2. 10s.) and 60 $11·95 (£3). Those of us who have seen an Arden in action have been amazed at the revs and power, yet price for the ·099 cu. in. capacity $16·50 (£4. 2s. 6d.) and with ball bearing crankshaft $21·50 (£5. 5s. 6d.)

The point I want to make is that we hear all about the inflation in America but we have not an engine to touch them either in power or in price. In fact I should go as far as to say we have not a decent engine in England. Cannot we aeromodellers get together and do something about it?. We are being taken for a lot of suckers. A decent engine at a decent price should be our cry.

Knowle, Birmingham. B. FAIREY.

The reason for the cheaper price of engines in America is only the old situation of supply and demand. The greater sale of engines in the U.S.A. results from the larger aeromodelling public, with a corresponding reduction in price. We do agree, however, that there is no reason why British manufacturers should not produce engines equally as good. It is design that is lacking in the majority of our engines. How about it, manufacturers ? We are receiving many letters on these lines.

DEAR SIR,

Let us hope that "Clubman" has taken the first step in setting right a matter which has remained a thorn in the side of British aeromodelling for only a short while, but already too long ; and about which there has been hitherto a universal silence. I refer to the state of affairs in Concours d'Elegance, particularly as regards Flying Scale. The silence is preserved by three types : those who fly only and have no interest in such competitions, those who treat the whole question of scaled-up solids with silent contempt, and above all those who perpetrate the crime by a silent and mutual concealment of it as such.

The control-liners, the sailplanes, the semi-scales even A.P.S. designs and well-known kits, and more orthodox types, are bound to fly if they are fit to stand a chance in a Concours ; but what about flying scale, and to a lesser degree, Experimental ? We all know Piper Cubs fly, but Libellulas and tailless scale models other than r.t.p. and U control ? The word "solid" is generally used nowadays to mean any non-flying scale model aircraft : very few larger solids are literally so, since accuracy, size and internal detail mean a built-up frame. Then (say the pot-hunters) what more simple than to build a 40 in.–50 in. scale job, of any, repeat any, full-sized aircraft spray on cream-coloured dope indefinitely, slap on G.–A what-have-you, stick a diesel on somewhere and call it Flying Scale ? It amounts to a "solid" with an engine in for looks, but do this and you will walk away with cup and cash without the crate ever leaving the desk : the possibility of flight of any sort is the last consideration. Do this and you have the typical British Flying Scale Concours Winner that has trooped round all the competitions big and small, staged in this country last season.

The French Piper Cub at the 1947 Internationals flew : since others did not, the Cub should have won. Foreigners play the game, why don't we ? *Prove* she flies ; don't make the diesel an excuse for pot-grabbing ;—join or form a solid club—they exist ! Most of these models are excellent otherwise, but are aerodynamically impossible at their size ; why pretend they are not ? Why cheat ?

Yet I do not blame these people—with so obvious a loophole, most others would and do think it a gift, and take it, what is to stop them ? To appeal to the conscience has proved futile unfortunately, both in other aeromodelling fields and universally—"Clubman's" frequent appeals prove that. Why therefore do not the Powers state categorically that all Concours models should prove their capabilities during the course of the day by a flight of, say, 20 seconds ? Twenty seconds is ample time for a model to show its paces while there is little risk of damage to show Scale jobs, and if the weather clamps, surely a signed statement or Airworthiness Certificate would meet the case ?

I am tired of seeing and hearing of spats and super finishes, cowlings and cabins, small fins and no dihedral ! And in the Experimental class, the experiment consists in how far one can rook the unwitting guest judges. Congratulations then "Clubman" for the lead which I hope other modellers and judges in the country will follow in future seasons. I say—prove she flies, be honest and sensible about it, in fairness to our hobby and good name abroad !

Nottingham. D. J. WOOD.

The SUNSPOT

A HIGH PERFORMANCE SAILPLANE DESIGNED BY ROY YEABSLEY DESCRIBED BY BILL DEAN

OUTSIZE in gliders and one of the most consistent performers amongst the 1946 British designs, is Roy Yeabsley's ten foot Sunspot.

You can build it in just over a week and the total outlay is only a fraction of that needed for a petrol model. The ultra light wing loading (weight is only 2¾ lbs.) rules out major crackups due to high speed contact with cars and other obstacles on the deck. Exceptional stability enables you to keep flying when other jobs are grounded by rough weather.

As for performance—the model has practically been all over the country on a solo goodwill trip! Best official flight at time of writing is 20 : 10 on a cloudless day—the model disappearing out of sight overhead dead above the launching point. On a 300 foot towline, consistent non-thermal flights of three minutes are turned in every time.

A dethermaliser is essential for this design. One of the parachute variety is used on the original model and is released by means of a slow burning fuse instead of the usual timer.

Fuselage.

Pin down the longerons on to the side view of the fuselage and add the spacers in the usual way. If you have to join strip for the longerons, make a lap joint midway between the wings and tailplane.

Build the other fuselage side on top of the one already on the plan and when this is quite dry, take them both up and sand them to exactly the same profile shape before slicing them apart with a razor blade.

The two side members are initially joined by the top and bottom side spacers at the wing position. Loop rubber bands over them to avoid springing apart again—then join together at the tail and bind with thread. Add all the intermediate top and bottom spacers, then pull together at the nose and add the remaining spacers forward of the wing. The nose block is now roughly shaped, cemented in place and then sanded to continue the smooth fuselage curves.

Three tow hooks are fitted, front hook for testing, centre for general flying and rear for calm weather, and all of them actuate to the towline. Two cross pieces of 1/16 in. sheet are fitted to take the central hardwood beam "A", to which the pivoting hooks are attached. When the hooks have been bound and cemented in place, a piece of fishing thread is tied to them and passed through to the tail where it is temporarily anchored.

The incidence block is carved from medium balsa, but it is cemented in place until final adjustments have been made on the field. Mould the canopy, using one of the patent liquids now on the market and likewise leave off until the incidence block is finally cemented to the fuselage. Well cement the wing and tailplane retaining dowels in place. Sheet the nose with 1/8 in. sheet where indicated and attach the bamboo landing skid.

Fin and Rudder.

Lay out the outline for the upper portion, using ¼ in. sheet for the L.E. and ⅛ in. for the T.E. When dry, remove from the plan and add the ⅛ in. sheet ribs. Then make the movable rudder by cutting the T.E. and adding the small riblets as shown. Use two pins for the pivot points. Cement to the fuselage noting that the L.E. passes through to the lower fuselage spacer and fill in with scrap between the fuselage and the first rib. Leave enough room for the tailplane to be pushed through easily. Sew and cement the 18 gauge wire to the bottom rib of the rudder tab. This is tensioned on the port side by a rubber band which holds on port rudder all the time the model is flying. The thread from the top hooks is fastened to the other side of the wire, so that when tension is applied by the towline, the rudder is pulled straight for a straight tow up. A piece of 1/32 in. ply (stop "x") prevents the rudder from being pulled past the central position by towline pressure.

Use 3/8 in. sheet for the lower fin, with 3/8 in. square central spar continuing up through the fuselage. Taper the outline to a streamlined section.

Wing Panels.

First make the tongue boxes from ⅛ in. sheet and ¼ in. S.Q. sides and insert them into the ½ in. deep slots provided in the first four wing ribs. Then join the ½ in. by ⅛ in. lower spars at the dihedral break and cement the keepers on either side. Cut out all the remaining ribs and start the assembly of both panels to ensure that they are both identical. Pin the spars down on to the plan and cement the ribs on the inner portion—then pull out the pins and tilt the spars so that the outer tip portions are flat on the plan and attach the outer ribs. Add the ⅛ in. balsa dihedral keepers to the ¼ in. square and ½ in. by ⅛ in. upper spars, then slot them into the upper notches cut in the ribs.

With the inner panels flat again, attach the leading and trailing edges, then tilt over and add the outer lengths and the sheet tips. The outlines are all roughly carved to shape before assembly and then finished after cementing in place. Note that all ribs are notched (one quarter) ¼ in. into the trailing edge and that ⅛ in. gussets are added at the root ribs and dihedral breaks. The leading edge is covered with 1/32 in. sheet to ensure a smooth air flow over the wing. Use Scotch tape to keep the sheeting in place whilst the cement is drying. Lastly, face the two root ribs with 1/16 in. ply and check all the cemented joints carefully to make certain that none have come loose.

Centre Section.

Cut the plywood tongue from ¼ in. ply and cut out 6 similar ribs—two from ⅛ in. and four from 1/16 in. sheet. Thread the ribs on to the tongue and then add the three

A 40FT WINGSPAN HIGH PERFORMANCE SAILPLANE

SUNSPOT

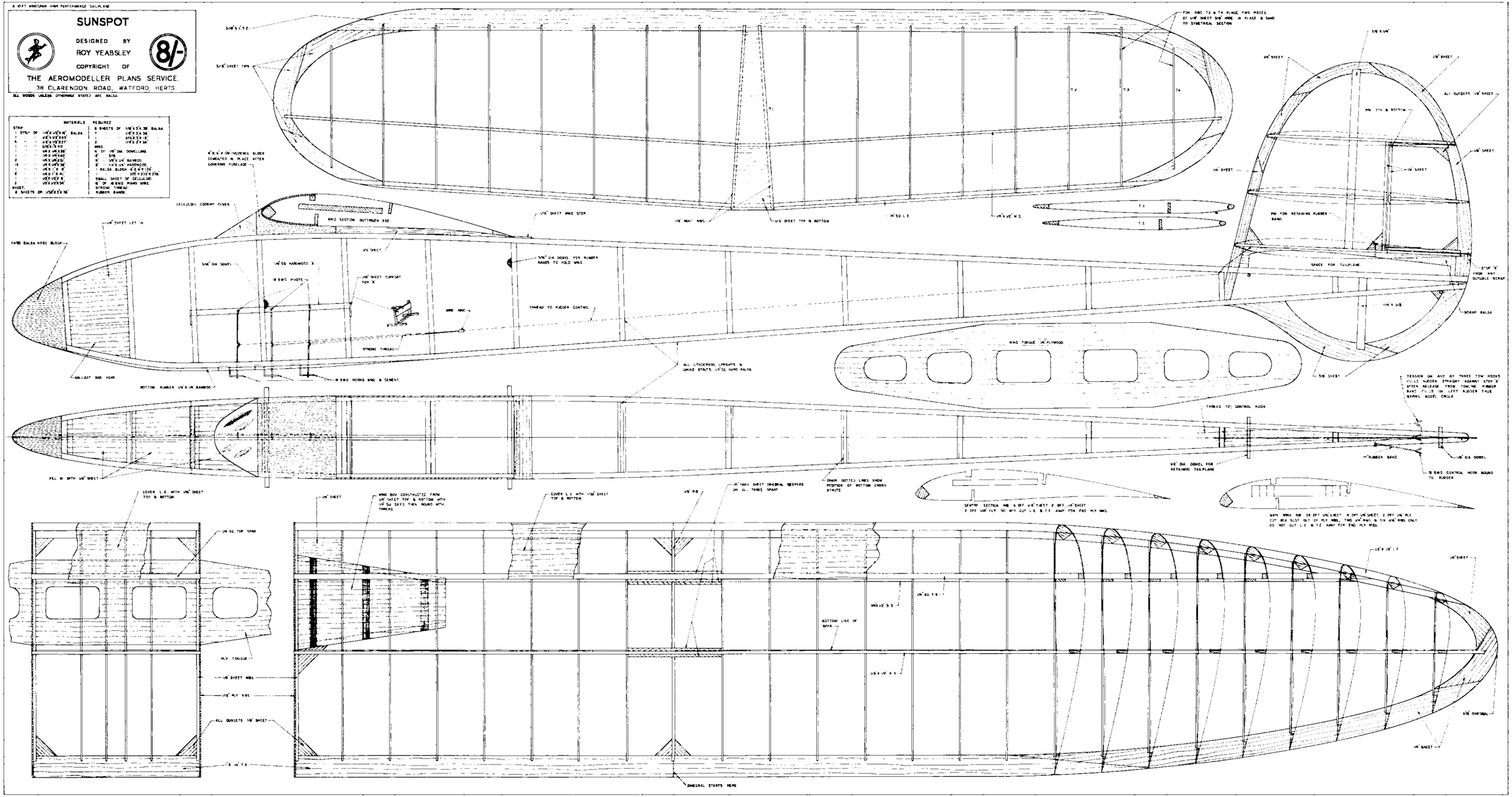
DESIGNED BY
ROY YEABSLEY

THE AEROMODELLER PLANS SERVICE.
38 CLARENDON ROAD, WATFORD, HERTS.

8/-

ALL WOODS UNLESS OTHERWISE STATED ARE BALSA

MATERIALS REQUIRED	
STRIP	
1 STRIP OF 1/16"X1/2"X36" BALSA	
1 " 1/16"X1/2"X45"	
4 " 1/16"X1/2"X37"	
1 " 3/16"X1"X40"	
1 " 1/16"X1/8"X38"	
1 " 1/16"X1/16"X6"	
2 " 1/16"X1/8"X12"	
13 " 1/16"X1/16"X36"	
1 " 1/16"X1/8"X5"	
6 " 1/16"X1"X6"	
1 " 1/16"X1/2"X6"	
2 " 1/16"X1/16"X36"	
SHEET	
6 SHEETS OF 1/16"X3"X36"	8 SHEETS OF 1/16"X3"X36" BALSA
	1 " 1/16"X3"X36"
	1 " 3/16"X3"X18"
	2 " 1/16"X3"X36"
	WIRE
	4 OFT OF 1/16" DIA. DOWELLING
	12" 3/16
	18" 1/16"X1/4" BAMBOO
	8" 1/16"X1/4" HARDWOOD
	1 BALSA BLOCK 4"X 4"X 1/2"
	3"X 2"X 2"X 3/16"
	SMALL SHEET OF CELLULOID
	18 OFT OF 18 SWG PIANO WIRE
	STRONG THREAD
	RUBBER BANDS



spars as you did on the wing. Check that the outer ribs line up with the root wing ribs, by attaching the wings to the centre section. If this is O.K. cement on the leading and trailing edges and cover the nose with 1/16 in. sheet.

Tailplane.

If possible use a single piece of hard ½ in. by ⅛ in. balsa for the spar steaming to achieve the bend at the centre section. All except the ⅛ in. centre ribs are cut from 1/16 sheet.

Pin down the spar over the plan and cement all the ribs in place, next add the ¼ in. square leading edge and the 1 in. by 3/16 in. trailing edge. Lastly, cut out and cement the tips in place, sheet the centre section and finish off with a fine piece of sandpaper.

Covering.

The original model is covered with ordinary tissue for lightness, but a sturdier model will result if petrol model covering is used instead. Each wing panel will need about six separate pieces of covering and be certain that the paper sticks to the under cambered portion of the ribs.

Only use clear dope or the total weight will go up by several ounces. Use four coats on the fuselage, three on the wings and two on the tailplane.

Flying.

Before you take the model out on the flying field, check that the flying surfaces are quite true and unwarped. Put on plenty of rubber bands to keep the wings and tailplane firmly in position.

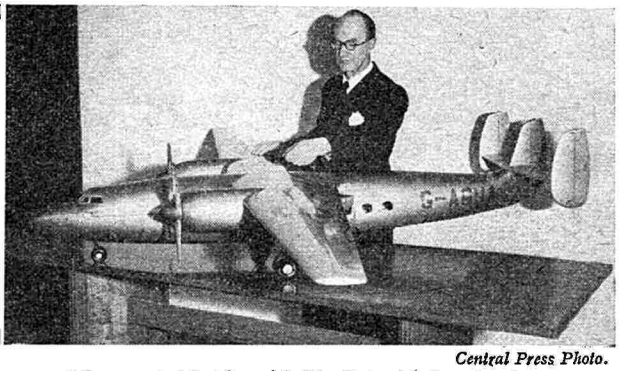
We suggest that you take the model out on a fairly calm day for the first time, as it is impossible to be really certain if you have trimmed correctly in gusty weather. When launched gently from shoulder level into wind a long flat slow guide with a gentle curve to the left should result. Any slight stalling or nose down conditions can be counteracted by varying the amount of weight carried in the ballast box. To avoid carrying too much dead weight in the form of ballast, the wing position can be altered slightly. but keep it as near to the position shown on the plan as possible. It should not be necessary to alter the angular setting of the wing and tailplane—careful construction will ensure that they are identical with the settings shown.

1/5th scale plans are given above. Full size drawings price 8/–, post free, are available from Aeromodeller Plans Service, Allen House, Newarke Street, Leicester.

AIRCRAFT IN MINIATURE

PART IX. Assembling Fuselages & Wings cont. & Engine Nacelles

By W. O. DOYLEND



Central Press Photo.

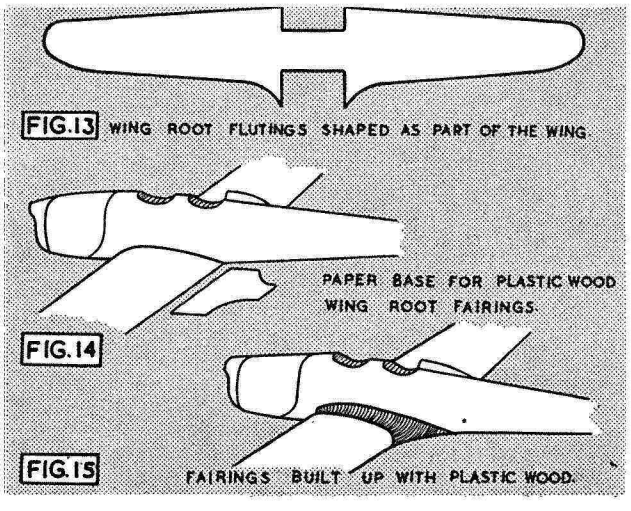
A fine commercial scale model of the Airspeed Ambassador, shown here with Airspeed's chief designer.

ON models, the fairing may be obtained by shaping it into the wing block from the start of the wing construction, but this is inclined to complicate the shaping of the wing and entails the making of a large cut-out in the fuselage for the wing joint.

A better method is to use plastic wood for the fairing, which is moulded into shape after the wing has been fitted. On large models a modification of the first method combined with the use of plastic wood will give a satisfactory result with the least amount of trouble. When this method is to be used, the curving back of the trailing edge of the wing root must be allowed for when setting out the wing plan on the original block. See Fig. 13. The wing is then cut out and shaped in the normal way. The cambering of the wing roots will have to be done with a half round or round file in order to bring the curved trailing edge of the fairing to a fine knife edge. When cutting the wing for its joint with the fuselage, this trailing edge must be treated carefully because the two fine points of the fairings are easily broken off. This is the big disadvantage of using this method. When the wing has been fitted, the upper surface, in the case of a low or mid-wing type, is faired into the sides of the fuselage with plastic wood. In a high-wing monoplane, of course, the under surface of the wing is faired in.

Where the size of the wing is not too large, plastic wood alone may be used and this is always to be preferred since it eliminates complication in the wing construction.

In such cases the wing is finished off and fitted to the fuselage in the normal way. A paper base is then cut to the shape of the trailing edge fairing and glued temporarily under the wing and fuselage as shown in Fig. 14. If possible, a grease-proof paper should be used for this base.



The fairing is then built up with plastic wood on the wing root and paper base. The wood should be built up in a succession of thin layers and moulded into shape with a long pointed pencil or suitably tapered stick until the correct form is obtained. See Fig. 15. The plastic wood should be allowed to set firm and it is then smoothed off with a fine grade sandpaper. Slight shrinkage may occur in setting and any cracks or gaps must be filled in. When the top of the fairing is smooth and uniform, the paper base is slightly damped and removed and the underside of the plastic wood is sandpapered to a smooth finish, cracks or gaps being filled in as before.

A little practice will be necessary to get the right knack of working plastic wood to shape. It is fairly fast drying so that the operation needs to be carried out as quickly as possible. A little patience will produce a neat job which will look extremely realistic when the paint coats are put on the model.

Plastic wood can also be used for fairing in the joints of tail planes and fins with the fuselage and in cases where the wing and fuselage joint shows any gaps. When using plastic wood, keep it well away from any naked flame as it is highly inflammable. Always replace the cap of the tube or lid of the tin after using or else it will set hard.

ENGINE NACELLES

In models of multi-engined types of aircraft, we come up against the problem of making and fitting engine nacelles. Where biplane types are concerned, the engine nacelles are, as a rule, separate units and are slung on struts midway between upper and lower mainplanes, and the job of making and fitting is purely straightforward. But in monoplane types, the nacelles are usually set into the leading edge of the wing and it is with these types that we shall be mostly concerned.

Several different methods of fitting the nacelles to the wings may be used, and here again, the choice will depend to a large extent upon the characteristics of the particular aeroplane which is being modelled.

In most cases when dealing with the construction of the nacelles, the sequence of shaping operations will be slightly different from those used in connection with fuselages. With nacelles it is nearly always advisable to shape the plan form first. Then the wing seating is cut and the rough nacelle is trial fitted to the wing, after which the side elevation shaping is carried out and finally the rounding of the nacelle to its finished form and its assembly on to the wing.

The most simple arrangement of nacelles will be those which are slung underneath or mounted directly on top of the mainplanes. Here, the cutting of a seating in the nacelle to take the wing will be a simple matter. Two

important points must, however, be borne in mind. They are, firstly, that where the wing is set at a dihedral angle the seating must be so arranged that the nacelle is vertical when it is fitted, in other words, the seating must slope down from the outboard to the inboard edge of the nacelle; and secondly, where the leading edge of the wing is raked back from root to tip, the seating must be arranged so that the nacelle will lie on a true fore and aft line in relation to the aircraft as a whole. These two points are illustrated in Fig. 1.

For both these types of nacelle the seating for the wing is shaped with a chisel and file. In the case of the underslung type, the seating will follow the line of the underside of the wing surface and with nacelles fitted on top of the wing the seating will be arranged to follow the camber of the upper wing surface. These are illustrated in Figs. 2A and B. Examples of aircraft on which the former method can be used are the Avro "Lancaster," De Havilland "Mosquito" and Westland "Whirlwind," and the latter method is found on the Boulton Paul "Overstrand" biplane.

In designs where the nacelle is set into the leading edge of the wing, the modeller has the choice of two equally good methods of fitting.

In the first of these methods, use is made of a cut-out in the leading edge of the wing and the nacelle itself is not cut to provide a seating. This method may be used on such types as the Handley Page "Harrow," Short "Empire" flying boat and the two components of the Mayo Composite or "pick-a-back" aircraft. The sequence of operations in making and fitting is as follows.

We commence with a rectangular block of the required dimensions for the nacelle. Using a fore and aft centre line, we mark the plan on the top and bottom of the block and carve to shape with chisel and file. The position of the leading edge of the wing is now marked on both sides of the block. This is shown by the line marked "A" in Fig. 3. Allowance must be made here for any raking of the leading edge of the wing. The wing section is also marked on both sides of the nacelle. This is shown by the hatched portion in Fig. 3 and here we must make allowances for the dihedral angle (if any) of the wing.

Now turning to the wing, we mark upper and lower surfaces, the fore and aft centre line on which the nacelle is to be fitted, remembering to make our line parallel to the true fore and aft line of the aircraft. We must also remember to take into account any dihedral angle of the wing and arrange our centre line on the lower wing surface vertically under the line on the top surface.

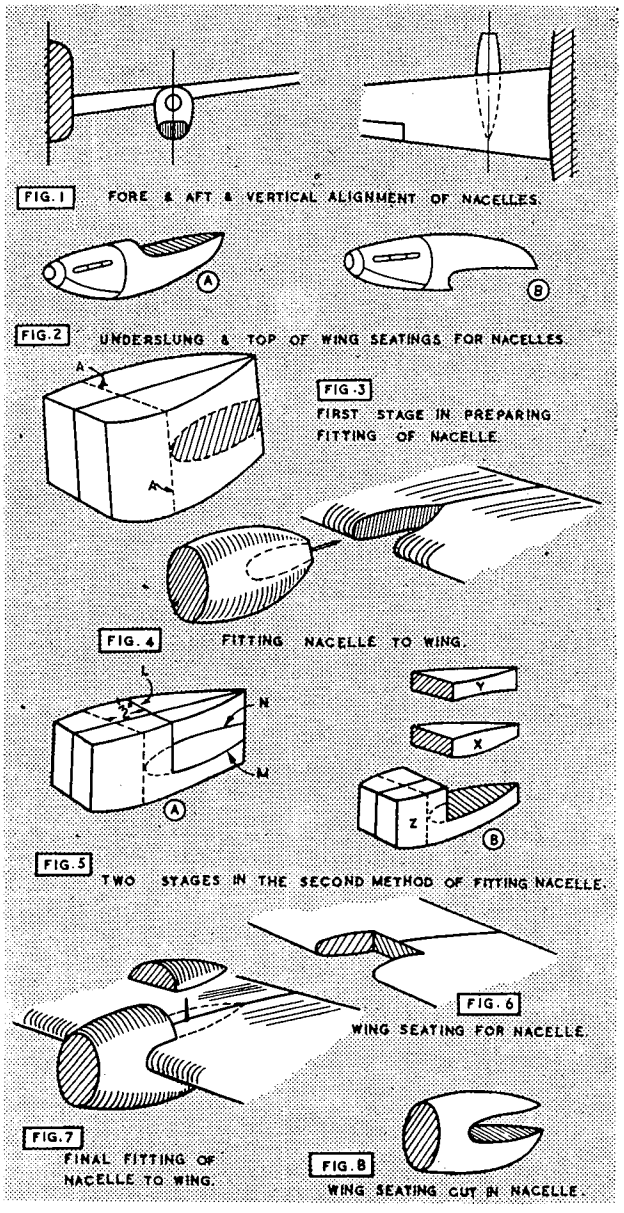
The shape of the tail of the nacelle is now marked on the upper and lower surfaces of the wing and the shape carefully cut out with a fret-saw. Notice that to keep the fitting of the nacelle vertical, the saw blade must be made to cut vertically, but this will be readily apparent if the shape of the nacelle has been marked equally on each side of the centre line on both upper and lower surfaces of the wing. The cut-out should be made a little on the small side and the edges finished off afterwards with a half-round file. A trial fitting of the unfinished nacelle is then carried out and the seating trued up until a good fit is obtained.

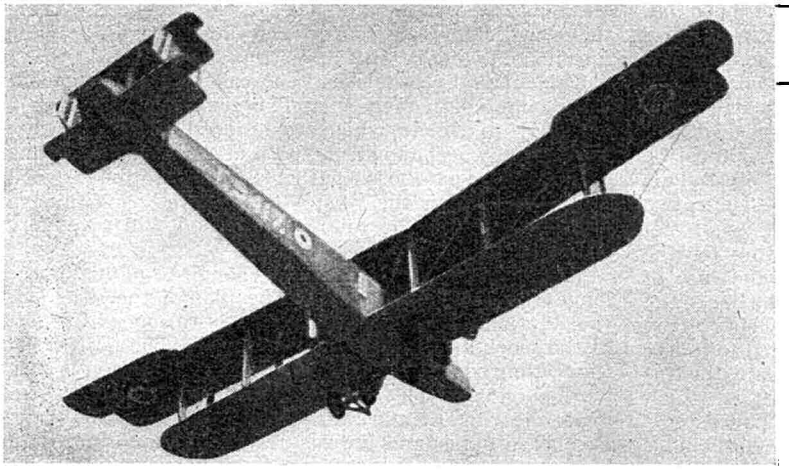
The shaping of the nacelle in side elevation is now carried out and it is rounded off to its final shape. The wing section marked on the sides of the nacelle must be preserved intact during these operations or the fitting will be spoiled.

The inside edges of the wing cut-out are then glued and the nacelle is fitted as shown in Fig. 4. A wire dowel in the tail of the nacelle may be used to strengthen the joint. When the glue has set, the nacelle is cleaned down with fine sandpaper and any fairing between nacelle and wing is built up with plastic wood.

This method can be used in all cases where the nacelle is the same length on upper and lower surfaces. But when dealing with nacelles which are designed to accommodate a retracted wheel and struts, we find that the under-wing portion of the nacelle is lengthened considerably. A good example of this is the Bristol "Blenheim." With such types of aircraft the following method will give very satisfactory results.

The original block is cut long enough to allow for the longest part of the nacelle. The plan of the *underside* (i.e. the longest) is the marked on both *top and bottom* of the block and the shape carved out. The position of the leading edge of the wing and the wing section is then marked on both sides of the block as before. Now, turning to the wing, we mark the fore and aft centre line of the nacelle on upper and lower surfaces in the normal way.





This fine old machine is of course the Handley Page 0/400 modelled to 1/72 scale by reader Alex. Aiken, who is also responsible for the well-posed photograph.

We now decide the depth of the cut-out which we shall make in the wing. This can be any convenient measurement and may be usually taken as far back as the widest part of the plan of the nacelle. It must be less than the length of the finished portion of the top of the nacelle, and on most types will amount to 3/8th or 1/2 inch. A measurement equal to the depth of the wing cut-out is then marked off along the top centre line of the nacelle, taking the measurement from the point where the leading edge line cuts the centre line. For the sake of illustration we will make this measurement 1/2 inch. At this point a line is marked across the top of the block at right angles to the centre line and this line is carried vertically down each side of the block until it meets the line of the lower wing surface of the wing section. This line is marked "L" in Fig. 5A. A similar line is marked on the top surface of the wing 1/2 inch back from the leading edge and at right angles to the centre line, the length of the line being equal to the width of the block at "L" in Fig. 5A. The width of the block at the leading edge line in Fig. 5A is also marked on the leading edge of the wing and the wing seating is then cut out as shown in Fig. 6. The saw cuts should be made just inside the lines and the widening out to the lines carried out with a file.

The nacelle block is now cut out as shown in Fig. 5B, a vertical cut with a tenon saw being made on the line "L" and horizontal cuts with a fret-saw along the lines "M" and "N" shown in Fig. 5A. This leaves our block in three sections as shown in Fig. 5B, of which the section marked "Z" is waste and is discarded. The lower portion marked "X" is now trial fitted to the wing and adjusted to give a good joint. This section is then shaped in side elevation and finally rounded off. The marking of the leading edge wing section must be preserved intact during this operation. The section marked "Y" in Fig. 5B is then cut down to the length of the upper portion of the nacelle, shaped in plan and elevation and roughly rounded off.

The nacelle can now be fitted to to the wing, the lower portion being pushed up into the wing seating and glued in place. The upper portion is then glued to the top of the wing and here a small wire dowel or pin may be used to give additional strength. See Fig. 7.

When everything has set firm, the upper rear portion of the nacelle can be finally shaped off to give a continuous smooth surface. This is best done with a file and sandpaper. The fitting is now complete.

The sequence of operations entails a somewhat complicated explanation, but in actual practice this method will be found to be fairly simple. Extreme care and accuracy is needed in marking out and cutting the wing and nacelle for fitting, but beyond the exercise of a little patience, no great difficulty should be experienced. The modeller will find that this particular method will be very useful as it is applicable to a large number of different types of aircraft.

In this description the lower part of the nacelle has been shown longer than the upper and this will be the case in the majority of types. One or two instances occur, however, in which the upper portion is the longer, an example being the Airspeed "Envoy." Where this is so, the same general method may be adopted, the dimensions of the various portions being altered accordingly.

This method of fitting nacelles is also useful in models of jet engined aircraft such as the Gloster "Meteor," where both upper and lower portions of the nacelle will extend to the trailing edge of the wing. In such types, holes should be drilled in the nose and tail of the nacelle to represent the intake and jet orifice.

One other method of fitting engine nacelles is popular and may be mentioned although it is not recommended for general use. This method consists of making a cut-out in the nacelle to take the leading edge of the wing, no modification of the latter being necessary. See Fig. 8. Some difficulty may be experienced in getting the cut-out accurate so that the nacelle forms a good fit on the leading edge, and the greater the length of the nacelle above and below the wing, the greater will this difficulty become. For these reasons, the method previously described is considered to be the more satisfactory.

In the foregoing descriptions stress has been laid on the importance of setting the nacelles on the true fore and aft line of the aircraft as a whole. Although this is normally the case, one or two exceptions will be met in certain types, two examples being the wing engines of the Spartan "Cruiser" three-engined light transport and the German three-engined Junkers Ju. 52. In both these cases the wing engines are slightly "toed out" of the normal fore and aft line, and in models of these and similar types account will have to be taken of this off-set of the nacelles when marking the wing cut-out.

In types of aeroplanes where the nacelles are slung midway between the biplane wings or are supported above or below the wings by a system of struts, no difficulty should be experienced. The nacelles are constructed in exactly the same way as a normal fuselage and the only fitting necessary will be the drilling of holes to take the ends of the supporting struts.

Engine nacelles should always be constructed in pairs, each stage of operations being carried out on both units before proceeding to the next. In this way it is much more easy to produce two identical units, a most important point since even a small difference between the nacelles on port and starboard sides will be very noticeable and will affect the general appearance of the model.

MEET THE MODELLERS


BILL DEAN

BILL DEAN, well known practical writer on aeromodelling, started building in 1934. Flying Instructor in the R.A.F., now at 23 designs kits for Keil. Main interest is Power Duration and Control Line—built 20 models in 14 months ! Started contest flying in 1946, winning Victory Championship at E.B. Most successful design—the "Slicker." D. C. BEATTIE, member of Bedford Non-Coms.—28, married with 3 year old daughter who prefers planes to prams ! Modelling since he was 14—has built well over 200 models. Prefers own design Power Pylons, but has a soft spot for solids and rubber—also builds engines. 1947 competition successes were one 1st., three 2nds., and three 3rds. R.F.L. GOSLING—well known trader pioneer in the North. Building since he was 11, now 50 and still at it. Chairman and a Founder Member of Merseyside M.A.S. Vice Chairman of the S.M.A.E., 1945–7. Has built some 90 models up to date of all types but prefers sailplanes. Held British T.L. and H.L Tailless Glider records 1940, Class "B" T.L. Glider, 1942, and Class "A" H.L. Glider 1943 with his most famous design the Ivory Gull—only beaten last year by a few seconds. Also won Thurston Cup 1942. Believes in rugged but good looking semi-streamlined designs. RON WARRING—another 'practical' expert and writer, close friend of Bill Dean. Aeronautical Consultant, 27, has built models since 1930. Author of numerous aeromodelling books. Once held British H.L. Rubber record—now holds British Helicopter record. Won Caton and Gamage Trophies, 1946 and came second in 1946 S.M.A.E. Individual Championship. Preferred Wakefield and Power Duration types, but main interest is now Control Line. Married, with two children—the 3 year old boy flies his father's control-line models !


RON WARRING


D. C. BEATTIE


R. F. L. GOSLING

WITH the first Gadget Review of the New Year, Consus takes the opportunity of wishing his readers (you, you, *and* you) all that's best in 1948.

This month we have a contribution from a reader making particular use of a very common but unexpected piece of mechanism—namely, spectacle frame hinges. TREVOR ELAM of Huddersfield writes in to suggest that these suitably modified make a very useful towhook for gliders. The hinge is trimmed as shown in the sketch, the cut portions of the frame being bent at right angles to the hinge and bound to the sub-keel situated inside the fuselage. Thus when the glider comes into land the hook is not bent or distorted but as soon as it brushes anything solid it folds up into the recess at the bottom of the fuselage and can suffer no damage. This would appear a very practical and useful suggestion for not too heavy gliders.

From C. MACFARLANE who we hope has recovered from his convalescence at the Central Hospital Warwickshire comes an ingenious electrical solution to the age old problem of beating the stall. His method makes use of a very simple electrical circuit with a pendulum make and break actuating solenoid operated elevators. When the angle of climb exceeds a safe amount the stop makes contact with the balance plate "pendulum". This closes the circuit and snaps down the elevators (Fig. 2).

K. WHITTINGTON of Sileby, Leicester, posted us a very neat method of bushing an ornithopter's pinion flapping mechanism (Fig. 3). Ordinary 16 gauge brass bushes are inserted in the loose end of the con. rod, the nut is screwed hard on and the surplus bush then filed or ground off down to the nut.

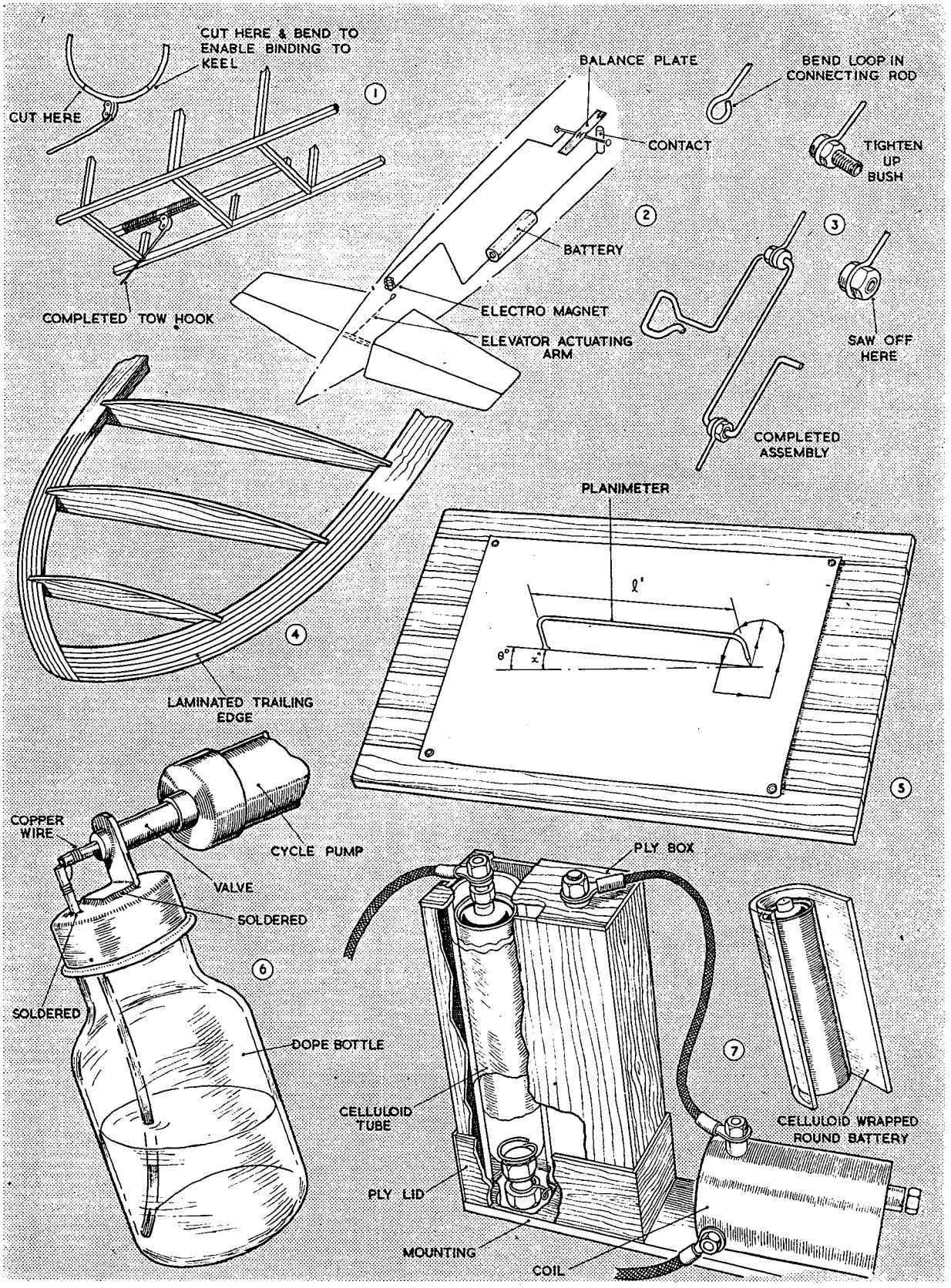
R. D. C. PASSEY of Rugby sends us an amazingly simple solution to the question of obtaining a strong wing tip. To obtain a laminated tip, merely leave an additional length on both leading and trailing edge and carefully slit them with a razor blade outwards from the last rib at 1/16th inch spacing (Fig. 4). Pin all round the inside of the tip outline and carefully bend the first wafer round to shape. Use cement liberally and bend round the second wafer and so on, until a laminated tip is built up. The laminations can easily be held by means of further pins round the outside. When dry all that is necessary is to sand to section.

Fifth item this month is a most interesting device sent in by R. W. WILSON of Skipton-in-Craven which solves the problem of calculating the awkward areas one so often comes up against in aeromodelling. Known as the Prytz Planimeter it can be made in a few minutes from any odd piece of metal rod providing that the length is such that dimension l becomes a convenient whole number. One inch of the rod at each end is bent at right angles, and one end is filed to a point while the other is hammered and filed to a simple hatchet shape. Care is necessary in aligning the hatchet blade with the tracing point but here is a simple check. Rule a pencil line on a piece of flat paper, place some tracing paper over the ruled line, then by lightly holding the tracing point end of the Planimeter guide it along the line. If the hatchet blade is truly aligned with the tracing point then it will follow directly along the line. Faulty alignment will be shown by the blade running to one side. Adjustments can be made by filing or bending the knife edge. To use the planimeter start with the tracing point somewhere near the centroid of the area, recording the position of the hatchet by pressing it lightly into the paper; the point is then moved along a radius at right angles to the arm of the instrument, around the area and back along the same radius to the starting point. It will be found that the arm has turned through an angle θ (measured in radians). The area traced out can be shown to be given approximately by $A = l^2\theta$ sq. ins. where l is the length between the tracing point and point of contact to the knife edge. If it has been made equal to 10 this simplifies multiplication. It follows from a definition of a radian that for small values of θ, it is sufficient to measure the distance measured by the knife edge (x inches) which should be multiplied by l to obtain the required area. While the instrument may appear crude accuracy will be assured if it is carefully made and properly operated. The ratio of l to the mean diameter of the area traced out should preferably be greater than 5.

A handy gadget for modellers illustrated in Fig. 6 is the invention of D. Mc CULLOCH. It consists very simply of a cycle valve with a plate and tube soldered over the shortened end, the valve rubber and jet assembly being retained intact inside the outer sleeve. The sketch clearly shows the remaining details.

For the petrol modeller well-known modeller D. NORTH of Enfield sends in the neat battery case originally used by him for a Natsneez. To build it two penlight batteries are needed, and two celluloid sleeves are made by rolling and glueing round the batteries. The sleeves should be of thick celluloid and there should be no play between batteries and sleeve (Fig. 7). When the tubes are dry remove the batteries and glue the tubes together, then fit a top from thick celluloid and drill the holes for the bolts that act as plus and minus terminals. Now make a 1/32nd ply case round the tubes and a lid to fit over the other end, soldering two brass springs to the nuts in the lid. These two terminals must be connected by copper wire to complete the circuit in the case. Next bind the outside of the case and lid with cellulose tape, then paint the two coats of coloured dope to make oil and waterproof. The outside ends of the bolts are used for fixing the case to the aircraft and an elastic band holds the case tightly in the lid while in use. Before putting batteries in the case the paper should be removed.

Onward therefore towards All Fools Day and, naturally enough, an April Gadget Review. Till then—Happy Landings!


CUT HERE & BEND TO ENABLE BINDING TO KEEL
CUT HERE
COMPLETED TOW HOOK
1
BALANCE PLATE
CONTACT
BATTERY
ELECTRO MAGNET
ELEVATOR ACTUATING ARM
2
BEND LOOP IN CONNECTING ROD
TIGHTEN UP BUSH
3
SAW OFF HERE
COMPLETED ASSEMBLY
LAMINATED TRAILING EDGE
4
PLANIMETER
l'
θ°
x'
5
COPPER WIRE
CYCLE PUMP
VALVE
SOLDERED
SOLDERED
6
DOPE BOTTLE
PLY BOX
CELLULOID TUBE
PLY LID
MOUNTING
COIL
7
CELLULOID WRAPPED ROUND BATTERY

MONTHLY MEMORANDA

BY O · G · THETFORD

One of eight F.K. 43 taxi aircraft built by Fokker. (*Hooftman.*)

Dutch Aviation.

Some notes from reader Hugo Hooftman of Holland, reach us this month concerning the renaissance of Dutch aviation since 1945. The world-famous K.L.M. Airlines is now operating a fleet of 63 aircraft, including 6 Douglas DC–4's, 10 Lockheed Constellations, 35 Douglas Dakotas and 13 Douglas Skymasters. This is to be compared with K.L.M.'s diminutive fleet in 1945 when internal airlines were operated by six Dragon Rapides, four of which have now been returned to this country and the other two seconded for service with the Dutch Air Force. Aircraft on order or currently being delivered to K.L.M. include 7 Douglas D3–6, 7 Constellations and 12 Convair 240's. The DC–6 replaces the Constellation on the New York run, the Constellations replacing the DC–4's on the route to Batavia. Douglas DC–4's are employed on the services to South America and South Africa, while the Convair 240's are reserved for European routes where they will supersede Dakotas.

A new air taxi firm in Holland is the Frits Diepen Vliegtuigen NV, stationed at Ypenburg. This firm operates eight Koolhoven FK–43 aircraft built under licence by Fokker. In addition, five ex-U.S.A.A.F. Cessna Bobcats are used and a number of Fokker Promoters are on order.

Since the liberation, the Fokker factory has been engaged mainly on modification of ex-R.A.F. and ex-U.S. Army Dakotas for European civil airlines. About fifty aircraft have been so converted and delivered to airlines in Finland, Yugoslavia, France, England and Portugal. First post-war Fokker aircraft is the F-25 Promoter shown at Paris in 1946 and one hundred of which are now being built. The Promoter is to be followed by other new types, including the Partner trainer and the Phantom jet-propelled transport which uses two Nenes. Latest development at Fokkers is the decision to build Gloster Meteors under licence for the Dutch Air Force. The Fokker-built Meteors will replace the Spitfire IX's and XIV's now with Dutch fighter squadrons.

Spitfires are the only combatant aircraft at present in service with the Dutch Army Air Force, which is mainly equipped with training and communications aircraft, including Tiger Moths, Oxfords, Ansons, Harvards, Austers, Dominies and Hudsons.

In marked contrast, the Dutch Naval Air Force is well equipped with Fairey Firefly I and IV fighters, North American Mitchell bombers and Hawker Sea Fury fighter-reconnaissance aircraft.

Civilian pilot training in Holland is carried out at the Government Aviation School at Gilze-Rijem and Ypenburg, where K.L.M. pilots are trained, and at the various Divisions of the National Aviation School which is devoted to sporting flying. The Government Aviation School is equipped with 22 Tiger Moths, 12 Harvards, 8 Beechcraft D-18's and 3 Junkers Ju 52/3m's. The National Aviation School operates 20 Piper Cubs and 4 Tiger Moths.

Few privately-owned aircraft are registered in Holland. Prince Bernhard of the Netherlands operates a Dakota, a Stinson Sentinel, a Messerschmitt Me 108, a Republic Seabee, two Siebel Si 204's and a Stinson Reliant. Further privately-registered aircraft in Holland are restricted to a few Piper Cubs and Autocrats, a pre-war Koolhoven FK–43, a Bucker Bestmann and an Ercoupe.

New Canadian Insignia.

A new national insignia has been evolved for aircraft of the Royal Canadian Air Force. The roundel has been abandoned and in its place is a Red Maple Leaf superimposed on a dark blue disc ground. This marking appears on the wings and fuselage, the normal red, white and blue flash being retained on the fin. Aircraft of the Royal Canadian Navy have the same marking, but with the Maple Leaf superimposed on a white spot within the confines of the dark blue disc ground.

Contract Cancellations.

Current economies decreed by the Government have resulted in a number of new British aircraft being abandoned, or the production contract reduced. It is announced that among the types not to be built are the Cunliffe-Owen Concordia, the Scottish Aviation A 4/45, the Short Seaford and the De Havilland Devon.

The Seaford was to have replaced the Sunderland as the standard R.A.F. flying-boat, but existing Seafords are to be converted as Solents for civil use and no further Seafords will be built.

The D.H. Devon, twenty of which were to have been supplied to the R.A.F. is a military transport version of the Dove. The prototype Devon, all-aluminium with R.A.F. roundels, is numbered VP 252, but will now be re-converted to civil Dove standard.

Finally, the British European Airways order for fifty Vikings has now been reduced to thirty-five, in view of the decreased traffic on European routes resulting from the Government travel ban.

A.W. 52 Flies.

After a delay of nearly a year, the Armstrong-Whitworth A.W. 52 jet-propelled flying-wing made its first flight at Boscombe Down on November, 13, 1947. The A.W. 52 is intended for research purposes and is operating with the Service serial number TS 363 painted on the fins at each wing-tip. Powered by two Rolls Royce Nene gas turbines, the A.W. 52 is notable as the first heavyweight all-jet aircraft to fly in Great Britain. The A.W. 52 was designed to a 1944 Specification and has a span of 90 ft. 11 ins., a loaded weight of 32,700 lbs., and a maximum speed in the region of 500 m.p.h.

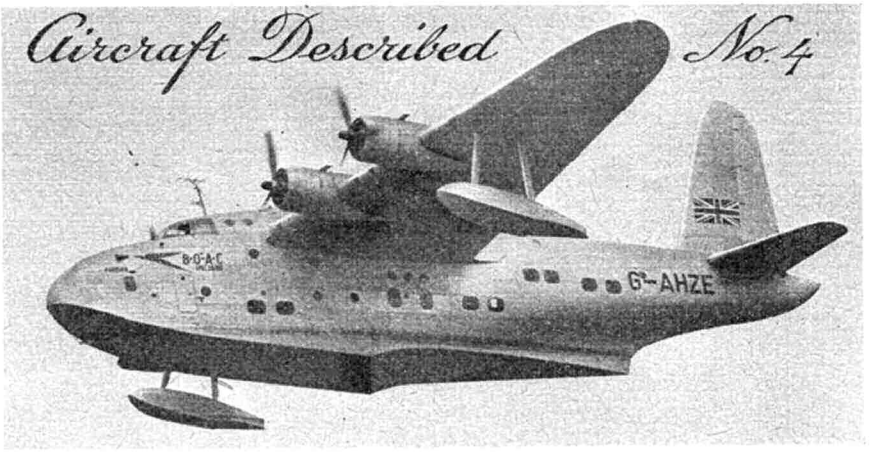
Flat-Top Squirts.

It is now learned that three squadrons of jet-propelled fighters are to be embarked on U.S. aircraft-carriers in 1948. The U.S. Navy Fighting Seventeen and Fighting Eighteen Squadrons will be equipped with McDonnell FH–1 Phantoms and North American FJ–1's respectively. The Fourteenth Marine Fighter Squadron will embark with FM–1 Phantoms.

THE SHORT S.25

SANDRINGHAM Mk. V

BY E. J. RIDING



JUST over eleven years ago, Imperial Airways Ltd. took delivery of the first of their fleet of twenty-eight Short S.23 "C" Class Empire Flying Boats which had been ordered straight off the drawing boards from Messrs. Short Brothers at Rochester.

Since then, the S.23 design has produced the following variations:—S.25 Sunderland, S.26 "G" Class Boat, S.30 Modified "C" Class and S.45 Seaford and Solent.

During the Autumn of 1942 a batch of Sunderland III's bearing the serial numbers JM.660 to JM.665 were allotted to B.O.A.C. for use on regular airline services, where, still in their war-time camouflage they became G-AGER to G-AGEW respectively. From time to time further S.25's were added to the B.O.A.C. fleet, and ultimately they became known as "H" or Hythe Class Boats. Apart from the usual internal modifications associated with passengers' comfort, the main external alterations lay in the sealing up of the nose and tail gun turrets and in the removal of other war equipment.

In November, 1945, Short Brothers launched the first Sandringham Mk. I at Rochester. Here again the basic airframe was more or less the same as that of the Sunderland, although the internal layout had been completely re-designed. Twenty-two passengers were accommodated on an upper and lower deck, the seats converting into bunks if so required. Provision was also made for a cocktail bar, promenade deck and dining-room. Externally the nose and tail were considerable modified to give them a streamline form.

The first Sandringham I was finished in Coastal Command colours with roundels and fin flash, together with the Transport Command code letters OQZF and serial number ML.788 on the fuselage. This machine later became G-AGKX "Himalaya" on the strength of B.O.A.C.'s fleet, and in Capt. R. F. Stone's hands it gave some striking demonstrations of low flying at the Eastleigh and Farnborough air displays in 1946.

Although at that time no further orders were forthcoming from B.O.A.C. for these aircraft, five assorted Mk. II's and III's were supplied to the Dodero Company of Argentina, four Mk. IV's to Tasman Empire Airways, and four Mk. VI's to Norwegian Air Lines (D.N.L.). Whereas the Mk. I was fitted with Pegasus engines, all the other marks had Pratt & Whitney Twin Wasps. Apart from the engines, the internal seating arrangements, etc., and flying aids, there was little from which to identify one mark from another.

Further demands for flying equipment from B.O.A.C. resulted in the appearance of the Sandringham V, also fitted with Twin Wasp engines.

Originally nine S.25's were modified to fulfil this order, their registration letters running from G-AHYY to G-AHZG inclusive, and they were named Portsmouth, Plymouth, Penzance, Portland, Pembroke, Portmarnock, Portsea, Poole, and Pevensey.

Of these G-AHYZ was destroyed by fire at Belfast before going into service, and G-AHZB crashed on alighting at Bahrein on August 23rd, 1947. Known as Plymouth Class boats, these aircraft are operating on the Corporation's "Dragon" route from Poole to India, China and Japan.

Our heading photo shows G-AHZE "Portsea" during a fly-past at the Elstree Air Display on July 27th, last year. Below, G-AHYY "Portsmouth" is shown moored out in Poole harbour, the passenger departure point on all B.O.A.C. Speedbird flying boat services.

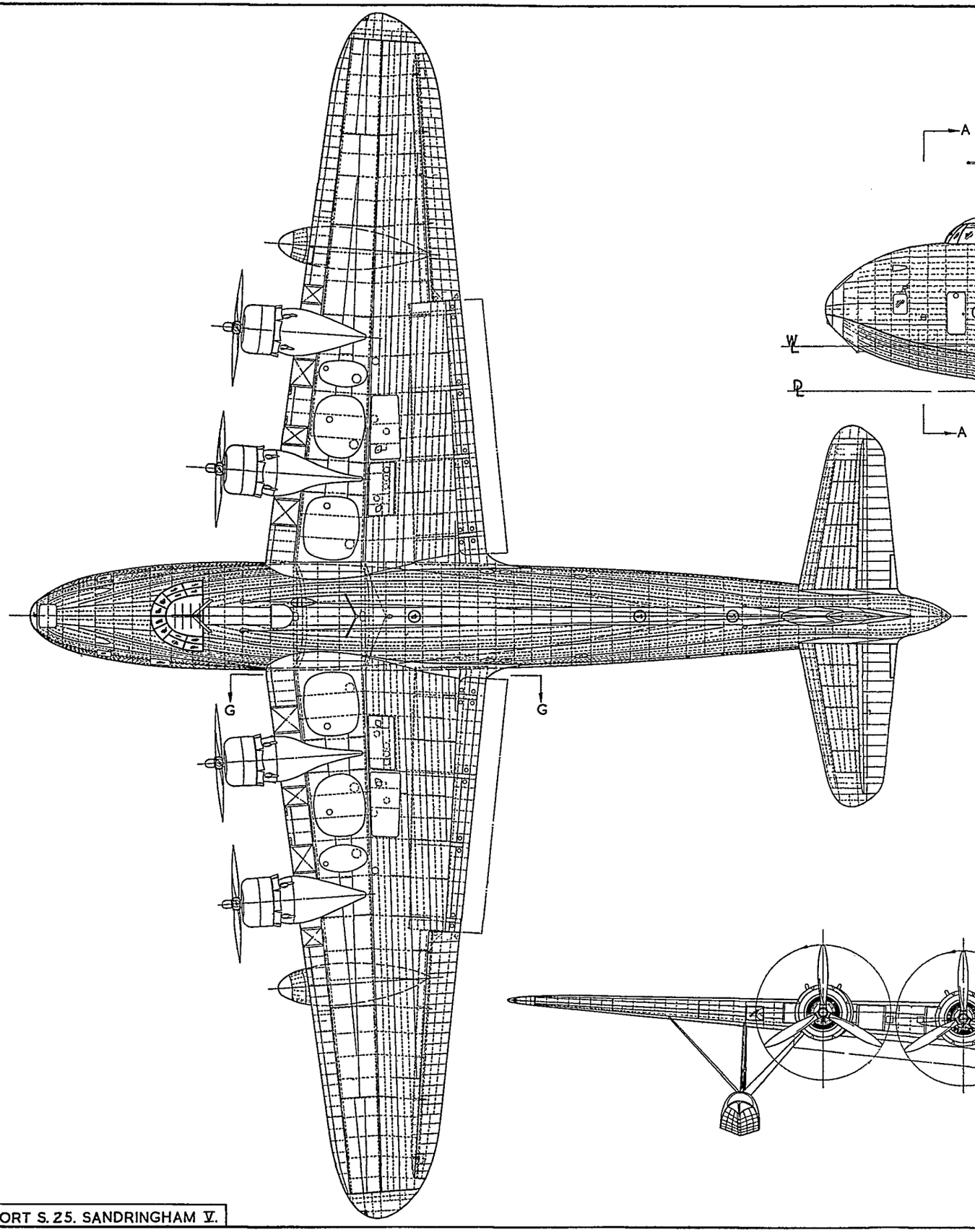
Construction.—Identical with S.25 Sunderland.

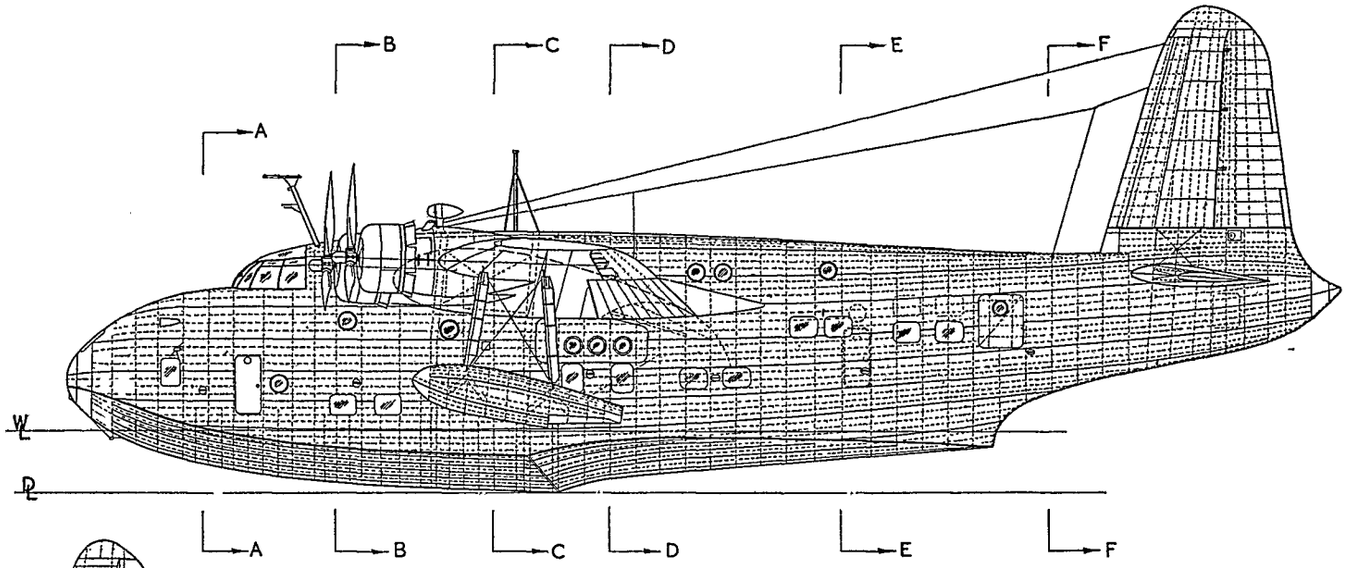
Colour.—The standard B.O.A.C. colour scheme, *i.e.*, natural anodised metallic finish with royal blue letters and insignia outlined in gold is shown in C. Rupert Moore's cover painting this month, in which Pembroke is depicted taking off from Poole on the first stage of her journey to the Far East.

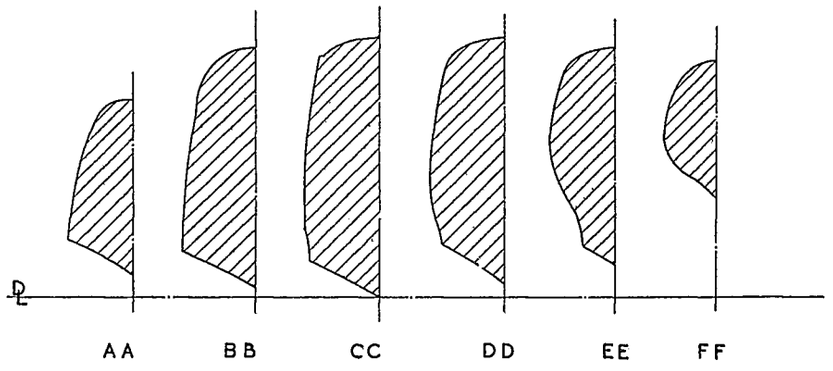
Specification.—Span: 112 ft. 9 ins.; Length: 85 ft. 4 ins.; height: 32 ft. 10½ ins.; wing area: 1,687 sq. ft. (Gottn. 436 Modif section); all up weight: 60,000 lbs.; tare weight: 36,550 lbs.; maximum speed: 207 knots; cruising: 179 knots; service ceiling: 18,700 ft.; fuel: 2,032 gallons in wings.

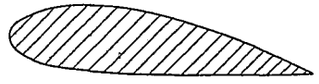
For Solid Modellers: ¼ in. to 1 ft. reproductions of the G.A. drawing are available, price 3/– from our Leicester Offices. Sets of four half plate photographs, price 6/– per set, from Eaton Bray Studios.

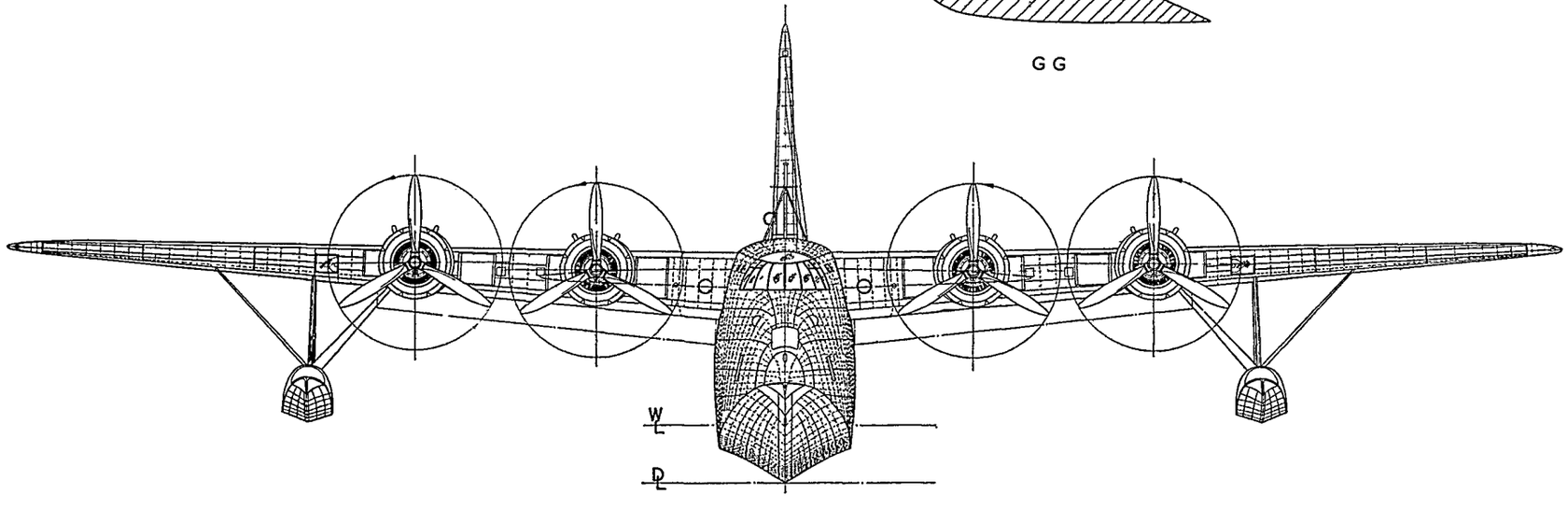
"Aeromodeller" Photographs







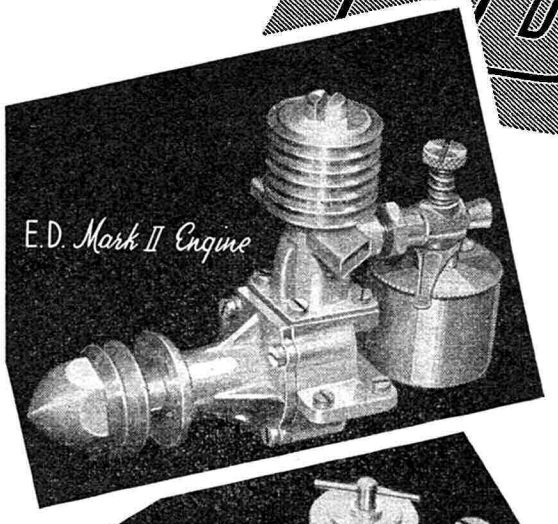


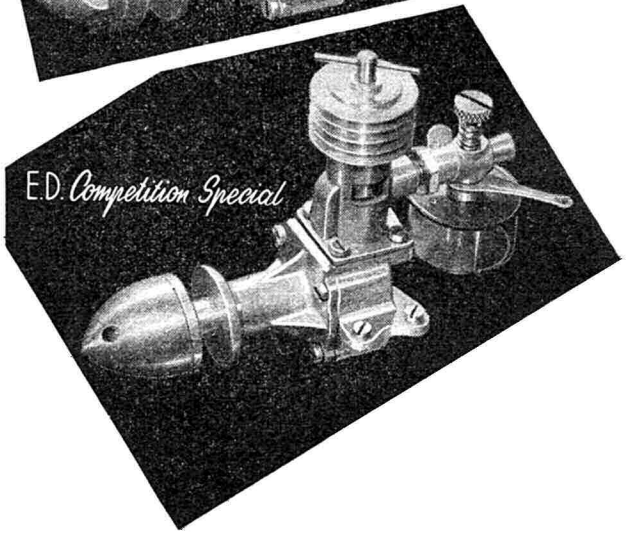


SHORT S. 25. SANDRINGHAM V.

FT.

E.D. 2 C.C. MARK II and the COMPETITION SPECIAL Diesel Engines





FEATURES:

Adjustable compression head, one piece Crankshaft, aluminium or plastic Fuel Containers, runs inverted and in either direction, develops considerably more power than its petrol driven counterpart. Built-in cut-out Control, easy finger starting, every engine guaranteed.

E.D. 2 c.c. MARK II

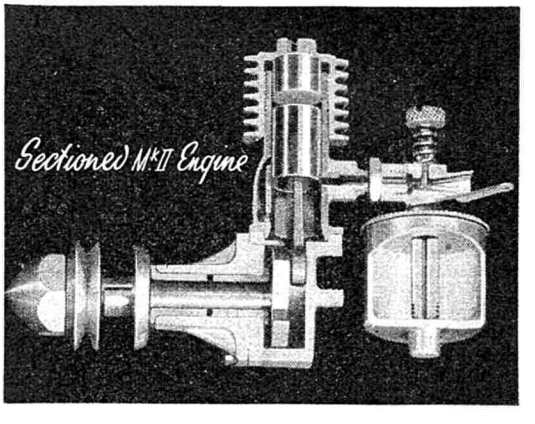
Bore $\frac{1}{2}$ in. Stroke $\frac{5}{8}$ in. Width $1\frac{7}{8}$ in. Length 4 in. Height 3 in. R.P.M. 6500. Static Thrust 18 ozs. Hole centres for Engine bearers $\frac{9}{16}$ in. × $1\frac{9}{16}$ in. Flywheel 10/6

Price **£4. 4. 0.** Prop. 10" 6/-

E.D. 2 c.c. COMPETITION SPECIAL

Bore $\frac{1}{2}$ in. Stroke $\frac{5}{8}$ in. Width $1\frac{7}{8}$ in. Length 4 in. Height 3 in. R.P.M. 8500. Static Thrust 23 ozs. Hole centres for Engine bearers $\frac{9}{16}$ in. × $1\frac{9}{16}$ in. Flywheel 10/6

Price **£4. 17. 6.** Prop. 11" 6/6



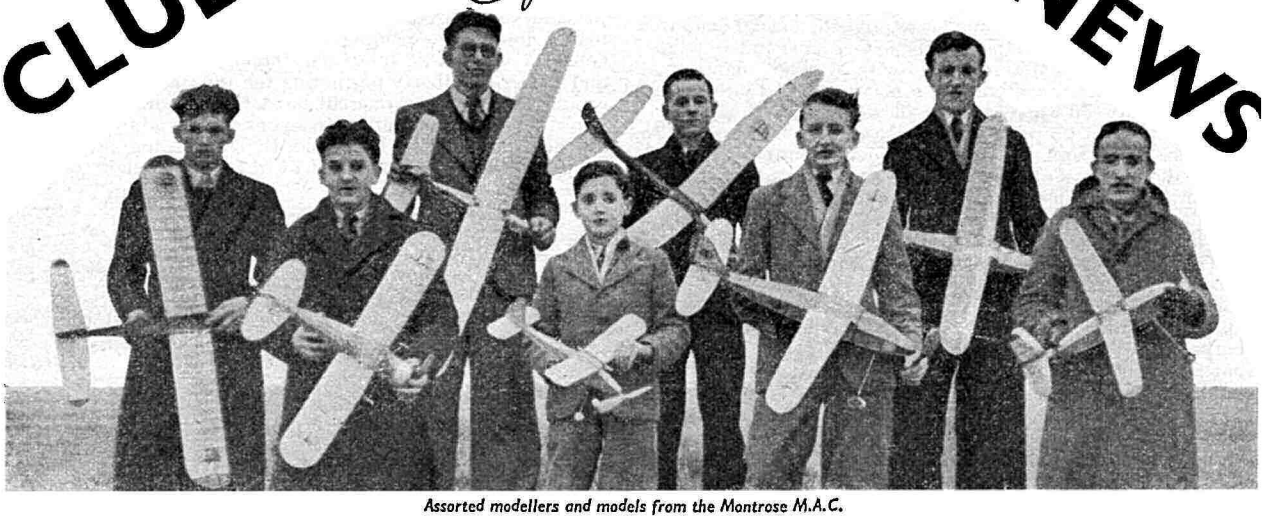
A precision engineering job throughout. Limits of 0.0001 in. maintained. Phenomenal performance. No plugs, coils, condensers, wires—and NO TROUBLE. An engine that has been accepted the world over as the very best of its kind.

Suitable Kit Sets in addition to the many control line kits that are being marketed (for which the E.D. Diesels excel); Keil Kraft Slicker 50, Scout Biplane Phantom, Dromes "Club" models, Frogs 45, Scorpion, Tiger Moth, etc., etc.

E.D. ELECTRONIC DEVELOPMENTS (SURREY) LTD.
KINGSTON ON THAMES
DEVELOPMENT ENGINEERS
1223. 18, VILLIERS ROAD, KINGSTON-ON-THAMES, SURREY, ENGLAND.

CLUB NEWS

By Clubman



Assorted modellers and models from the Montrose M.A.C.

THE results of the postal ballot for Officers of the S.M.A.E. for the coming season is just announced, and several changes will be noted. The full list is as follows :—

Chairman	— Mr. A. F. Houlberg.
Vice-Chairman	— Mr. C. A. Rippon.
Secretary	— Mr. D. A. Gordon.
Competition Sec	— Mr. H. R. Turner.
Technical Sec.	— Mr. G. W. W. Harris.
Records Officer	— Mr. C. S. Rushbrooke.

The Treasurer, Mr. L. J. Hawkins, and the Press Sec. Mr. H. York were returned unopposed.

Voting was fairly heavy, and thanks are due to those officials who had the job of sorting out this important task. That the Council's job during 1948 will be a busy one is certain, but there can be no doubt that the Society is now embarking on a most important phase in its career, and I trust it will receive help and co-operation from all interested in the hobby. I look like being kept busy sorting out records, figures etc., but I always had a liking for figures. Yes—both sorts if you like.

A recent conversation with a rabid Wakefield fan brings out the fact that no provision has been made in the S.M.A.E. contest calendar for Elimination Trials or other selection meetings to decide the British team to compete in the (expected) blue riband event this year. As I reported last year, the Americans are extremely eager to make a start on the series once again, and though good grounds were expressed on this side of the Atlantic for holding off last year, I'm afraid they won't hold water this season, and we'll have to get down to it.

As an ardent Wakefield modeller myself, I come out once more with a plea for a better selection method than used pre-war, when all and sundry travelled from all over the country to take part in what eventually developed into a scramble.

I therefore place on record once again my suggestion that the Wakefield Team shall be decided by progressive selection, via club and/or Area preliminaries, followed by the selection Trials proper devoted to a proven percentage of participants in the local eliminators.

By holding localised preliminaries a much larger number of entries will be attracted in the initial stages, but by virtue of the spread over of such local meetings, numbers can be handled easily with full time and attention given to all. From the results of such meetings, an agreed percentage of finalists can be selected, providing an entry with which the organisation can adequately deal—and with the full knowledge that such organisation will have only tried and proven fliers to accommodate.

Another point in favour of this method is the strong possibility of a bang-on Wakefieldite not being able to afford the fare to a centralised eliminator, but who, on proving his worth at a local meeting, could be subsidised to the finals by his club, area or even the central body.

Whilst the selection committee created last year undoubtedly did a good job of work for the Swiss and Irish meetings, there can be no doubt that this method left a lot to be desired, and is dead against the principles on which the Wakefield Team has been traditionally appointed. Granted we all know a number of automatic selections for such a team, but—and it's a big but—such a method of selection does not take into account the fact that a comparative unknown may be the equal of the famous, but has yet to prove his worth in open contest. A preliminary weed-out trial will give him his chance.

A final argument I bring forward is that, whilst it is common for a contest to be won (or high time made) at such a preliminary, it is doubtful if the dose could be repeated at a further meeting, and such fluky local finalists would stand a chance of further elimination, leaving the final six as well tried and proven fliers of undoubted consistency.

I make these remarks public rather than just to the S.M.A.E. as I feel that this is a matter of wide appeal and should receive the attention of all modellers interested in this important class of model, and the Trophy donated by that grand supporter of our hobby, Lord Wakefield.

News from our American fellow enthusiasts is always welcome, and the following items culled from the current issue of "Model Aviation"—the A.M.A. news-sheet—will interest you. Item 1 is that only one model per event can be entered by each individual, thus cutting out the practice prevalent on the Continent of having more than one machine in the same comp. I'm all for this rule personally.

Of particular interest in view of our own S.M.A.E. findings is the imposing of a flight limit, but the Americans go to 10 minutes instead of our 5. Aggregate of times is also introduced, replacing averaging.

For free flight "gas" models the power loading is fixed at 100 oz. per cubic inch piston displacement, but it is not stated whether this figure is maximum or minimum. No fuselage cross section or wing loading regulations are imposed, but for record purposes all flights must be r.o.g. In contests, six attempts are allowed to determine three official flights, less than 40 secs. counting as a no-flight.

The control-line fiends will find interest in the following regs. laid down for this type of flying. Two lines are the minimum required for safety purposes, and the control handle must not project more than six inches beyond the hand of the flyer. Speed computations must be made on standard length lines as follows :— Class A–42 ft. ; Class B–

52½ ft.; Class C 60 ft.; and Class D (including jet)–70 ft. The rules state " pylon required ", by which I interpret that the fliers forearm must rest on a standard in the centre of the circle to prevent wangles such as whipping, etc. Three laps are flown before timing commences, and the official distances for each class are A–5 laps, B–8 laps, C–7 laps, and D–6 laps. Three timekeepers are required, with watches showing at least 1/10th second calibration, a maximum of 1/5th second variation between watches being allowed.

A class for jet propelled models is introduced, classed with the Class D engines, but the tail orifice is limited to 1¼ ins. inside diameter. Compressed gas (CO–2) is also brought in, no limits on engines, loading or cross section, but only one standard cartridge is permitted for each flight, and said cartridges must not be heated beyond body temperature.

The **LONDON AREA** have instituted a ruling that I recommend to all other Areas (and clubs) in that at all power contests organised by the L.A. " entrants must produce a current certificate of third party insurance cover ". No longer can we tolerate arguments on the field as to whether or not a competitor is insured—certificates must be carried and produced on request.

The **RADIO CONTROLLED MODELS SOCIETY** has made steady progress, and membership in all sections is rising. Lectures, etc., have been given, and a scheme is now on foot to establish areas similar to those under the S.M.A.E.

An inter-club control line contest organised by the **NORTH LONDON CONTROL LINE M.F.C.** took place on the 14th December last, the visitors on this occasion being the St. Albanites (Cement Squeezers to you!). Over 100 enthusiasts were initiated into the delights of looping, and the extreme responsibilities of judges at such events were given emphasis. Weather was not too kind, and one or two prangs were a natural experience, but the atmosphere was more pioneer than competitive, and a very good time was spent by all. Thirteen names were entered for the contest, St. Albans knocking up 285 points against the Londoners 155, finalists being as follows :—

ST. ALBANS	**E. J. Buxton**	**205 points**
	P. Brown	**50 ,,**
	P. Peck	**30 ,,**
NORTH LONDON	**R. Moulton**	**70 ,,**
	H. J. Nicholls	**45 ,,**
	R. Moulton	**45 ,,**

As reported in last month's News, I've been spreading my wings a bit, my latest trip being to the Manchester area, where I attended the annual dinner of the **ASHTON & D.M.A.C.** A very enjoyable evening commenced with 'eats' and finished with a show of films prepared by Secretary Titterington, these forming an extremely interesting record of club activities over the last two seasons. The Rootes Trophy—won by the club for the best showing in Area Rallies during the 1947 season—made a fine centre piece to the table, and it is good to know that this club is now getting back its old pre-war prestige in contest matters. Thanks for a good time Ashton.

The **EASTLEIGH & D.M.C.** visited the Portsmouth lads for an r.t.p. meeting, losing to the home boys by 7 points to 4. A closely contested match showed a final difference in aggregates of only 10 secs.

Doug. Gordon of the **SOUTHAMPTON M.A.C.** wound up the season with a fine record breaking flight on the 12th October, beating the existing club record by 24·3 secs. The model, a class A glider, was launched on a competition flight (with fuse unlit!) and passed o.o.s. after 8 : 03·6. Binoculars were available, and with their aid the model was kept in sight for a total time of 15 : 22·5—a fine performance (and a feat of endurance on the part of the timekeeper!).

Having acquired an excellent room for weekly meetings, the **DURHAM CITY M.F.C.** entertained the Easington club at an indoor flying event, the honours being fairly evenly shared. A. J. Nunn of Durham put up the best duration of the evening with his class A " Spiv ", clocking 1 : 50.

Having tasted its first season of outdoor competition flying, the **BELFAIRS M.A.C.** feel quite satisfied with the results, though high winds prevented higher placings in National events, many models being lost. Club records to date are :—

Tow launch Sailplane :	**P. Field**	**4 : 10 o.o.s.**
,, ,, Tailless :	**B. Hutton**	**3 : 25 o.o.s.**
R.O.G. Rubber :	**R. Miles**	**6 : 10 o.o.s.**

With a possibility of the Wakefields being held this year, a page in the **BLACKPOOL & FYLDE M.F.C.** club mag. makes interesting reading. In the form of a " Wakefield Quiz," a number of questions should test your knowledge, and I take the liberty of quoting the quiz herewith for your interest. No prize is offered! but let's see how many of you know the 100% answer. Send your replies addressed to me at the A.M. offices—I'll stand the racket for soaping the postman when he complains at the extra weight of mail. Here goes :—

1. (a) *Which country holds the Wakefield Cup at present ?*
   (b) *Who won it ?*
2. (a) *In which year was the first Wakefield contest held ?*
   (b) *Who was the winner ?*
3. *Who has made the longest flight in any Wakefield contest ?*
4. *Who has made the most appearances in a British team ?*
5. *Except for Great Britain and America, who have won the cup five times each, France is the only other country to win the cup.*
   (a) *In which year did France win it ?*
   (b) *Which aeromodeller won it ?*
6. *The contest has only once been won by a low-wing model. Who was the winner ?*
7. *In which year was the minimum weight ruling of* 8 *ozs. introduced ?*
8. *What is the maximum number of members allowed to each team ?*
9. *Which aeromodeller has twice won the Wakefield Cup ?*
10. *Which Northern club had two fliers representing Great Britain in the* 1938 *Wakefield contest ?*

There you are—should produce a little brain-searching at one of your club night 'do's, and I bet not many know all the answers.

The newly formed **TORBAY M.C.** has started off with a bang, recent fairly good flying conditions enabling them to give displays to the local schools and the Dartmouth Royal Naval College, where they stirred up a great enthusiasm for aeromodelling. Control line flying was demonstrated to a number of V.I.P.'s, R. Drew's " Hornet " (E.D. powered) clocking 50 m.p.h. for a club record.

The **BLACKHEATH M.F.C.** claim a novel form of indoor competition, appealing to the power enthusiasts, but not for those who like a bit of peace and quiet. This is an engine starting contest—and what a " do " it was. Nine entries dealt with 6 different makes of diesel and an Ohlsson 23—plus a host of realistic competition failures. One chap ran out of fuel, another had a leaking tank, and a third suffered a broken crankshaft. (New engine.) Times showed that the petrol engine can at least hold its own, placing second to the winner, D. Dudley's " Frog 100 ", which started consistently in two seconds when warm.

Secretary Nicholson of the **YATESBURY M.A.S.** won a recent nomination contest, good flying weather helping to set up a goodly list of records during the year. Nicholson holds the R.O.G. Rubber figure with 6 : 55, also the R.T.P. time of 1 : 47. Sykes' time of 10 : 00 in the glider class (H.L.) and Morriss' 25 : 50 o.o.s. from a tow launch show good comparisons with the power record of 6 : 35 put up by J. Andersons model. Speed control line jobs and a 10 ft. span radio controlled glider are under construction.

A clubroom and hall are now available in the **GAMBERWELL M.F.C.** for three nights a week at the Dog Kennel Hill School. A very interesting model reported is the fully circular flying wing designed by J. Cheshire, with a diameter of three feet. News of this will be awaited with interest.

Following a visit by the Torbay club to Totnes, a club was soon formed, the Mayor and councillors being mainly instrumental in this project through the good work of Councillor Bowyer. The Mayor was elected Chairman and a full committee elected and the club launched in fine style. Good work Totnes, and a special word of praise for the Torbay club for their propaganda in the hobby.

As r.t.p. enthusiasm expanded in the **LEEDS M.F.C.** the flying room seemed to decrease in size, and a large gymnasium was obtained. On the first night however, the Dare Devil Control Line Aces turned up in force, and proceeded to earn the title of Dizzy Beggars in no uncertain manner, relegating the rubber fans to one corner. Following this a conference was called, and the power and lightweight stalwarts operate on separate nights. Indoor flying has improved in consequence, and microfilmies are beginning to appear.

The **BRENTFORD & CHISWICK M.F.C.** entertained eight clubs to an Indoor Gala in December last, when some very good times were put up as follows :—

1.	J. Wingate	(Streatham)	10 : 13 agg. of 3 flights.
2.	R. Copland	(N. Heights)	9 : 33·8 ,, ,,
3.	I. Dowsett	(Brentford)	7 : 44 ,, ,,

J. Knight of North Kent put up the best individual time for seniors of 3 : 55, Wingate beating this with a time of 4 : 09 in the junior class.

Members of the **SALISBURY & D.M.E.S.** now have the use of a local R.A.F. airfield for outdoor flying, and a hangar for control line and race car work. Nice going Salisbury—we should be hearing of you in national events soon.

The old **HACKNEY M.A.C.** has been reformed, and will use the Marshes as flying ground, with indoor events at Tottenham Road Schools on Tuesday and Thursday evenings. The first contest—an open glider affair—was won by F. Bates with two nice flights of 0 : 51 and 3 : 00 o.o.s.

An exhibition staged by the **R.A.F. WATNALL M.A.C.** in aid of the Benevolent Fund produced 35 models for show, and over £5 for the fund. Best flying model was judged to be a " Phantom " built by Mr. Blore of Nottingham, a magnificent aluminium " Super Fortress " taking honours in the solids section.

The small though keen **CUMULO CATCHERS** club got walloped by the Harrow boys in their round in the L.A. r.t.p. comp, but plenty of experience was gained for future use. H. Portney has once again pushed up the club helicopter record, the latest time being 24·6 secs. whilst a further indoor record goes to D. R. Reece with a free flight time of 2 : 00.

The **CHEADLE & D.M.A.S.** finished up a very successful outdoor season with a generous supply of wins, particularly in the power class. This club owns 58 free flight and 12 control-liners at the moment—and more being churned out. (Nigel Howards' Arden 199 powered job, lost at the September Midland Rally, was returned after a spell of two months, little the worse for wear, having rested under a hedge.)

December 21st saw the first inter-club competition between the **BATTERSEA & D.A.M.** and the Park M.A.L. Fair weather was experienced, and contests were held for rubber duration and gliders. Results :—

Rubber duration :	**W. Hicks**	**(Park)**	**6 : 23**
	R. Pollen	**(Park)**	**4 : 17**
	R. S. Clarke	**(Battersea)**	**4 : 01**
Gliders:	**J. McKenna**	**(Park)**	**6 : 23**
	J. Brain	**(Park)**	**5 : 35**
	R. Wilshaw	**(Battersea)**	**2 : 07**

David S. Skinner of 3, Dey Street, Otago, New Zealand and others of his club members would like to correspond with aeromodellers in this country, so write as soon as you like.

And so, here we go into another new season with hopes for even better weather than in 1947—and by and large a few more necessary supplies coming our way. It's amazing the number of engines making their appearance on the fields and in the clubrooms, but let's hope that the winter months will be spent in getting the bugs worked out of the engines and starting techniques. I got proper browned off at many meetings last year waiting and fidgeting while energetic fingers flipped and flipped away at stubborn engines. Follow Blackheath's example and have a few comps. for quick starting—it will pay dividends on the field this summer.

THE CLUBMAN.

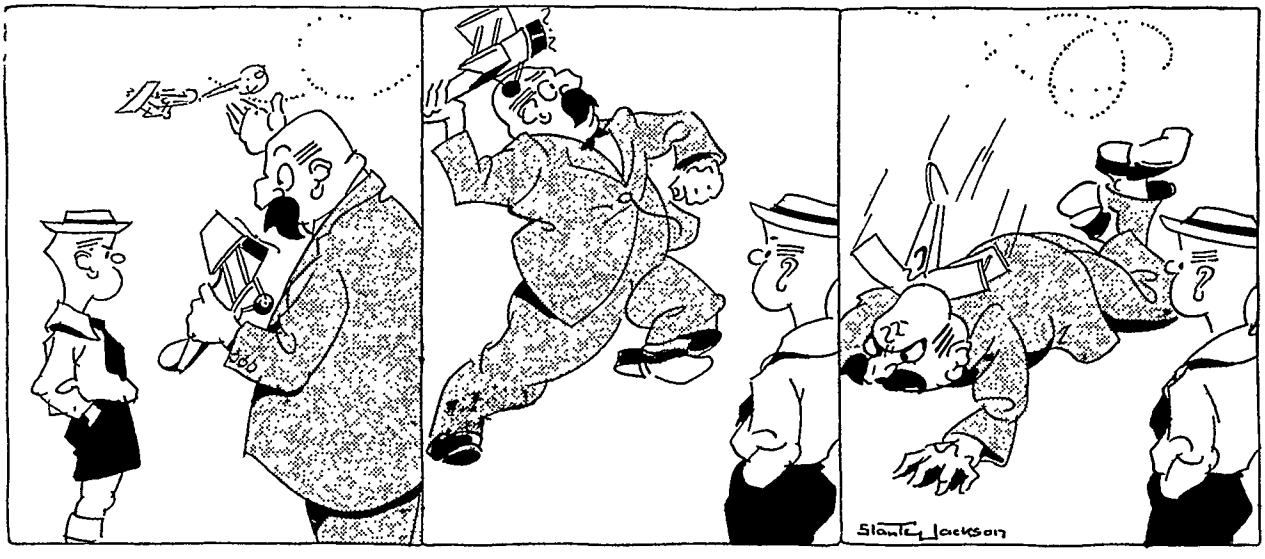
NEW CLUBS.

WORKSOP M.A.C.
R. A. Hempson, 7, Gladstone Place, Eastgate, Worksop, Notts.
MIDDLESBROUGH M.A.C.
F. E. Dewell, 96, Corporation Road, Middlesbrough, Yorks.
HIGHER WALTON (Lancs.) D.M.A.C.
R. C. Reed, " Swan Inn ", Higher Walton, Preston, Lancs.
EAST GRINSTEAD & D.M.F.C.
M. Green, " Holly Mount," Snowhill, Copthorne, Sussex
HACKNEY M.A.C.
W. H. Tickner, 35, Adley Street, Hackney, E.5.
COLWYN BAY & D.M.A.C.
R. V. Judge, " Aviemore," Rivier's Avenue, Colwyn Bay.
BURY ST. EDMUNDS M.A.C.
Wm. F. Hanna, c/o, Mrs. G. C. Orriss, Abbot Road, Bury St. Edmunds, Suffolk.
WEYMOUTH HANDICRAFTS & MODEL CLUB.
L. Kerry, The Training College, Dorchester Road, Weymouth.
ZEPHYRS M.A.C.
R. Jessop, 2, Burleigh Road, Addlestone, Surrey.

SECRETARIAL CHANGES, ETC.

BLETCHLEY D.M.E.S.
N. K. Peerless, 53, Aylesbury Street, Bletchley, Bucks.
COVENTRY & D.M.A.C.
G. B. E. Coombs, 97, Tennyson Road, Coventry.
GRIMSBY & D.M.A.C.
R. L. Goddard, 11, High Street, Cleethorpes, Lincs.
AINTREE M.A.C.
A. L. Chandler, 34, Aintree Lane, Old Roan, Aintree, Liverpool 9.
ERDINGTON & D.M.A.C.
C. P. Williams, 27, Mount Street, Nechells, Birmingham.
LOUGHBOROUGH M.A.C.
C. Clarke, 33, Skelthorpe Avenue, Loughborough, Leics.
NORTH LEICESTER & D.M.A.C.
L. J. Wood, 86, Syston Street, Leicester.
FRANCIS STREET A.M.C. (Disbanded).
PETERBOROUGH M.A.C.
H. J. Wilson, 56, Churchfield Road, Walton, Peterborough.

Egbert . . . . .



CLASSIFIED ADVERTISEMENTS

PRESS DATE for April issue—March 1st.
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COPY should be sent to the Classified Advertisement Dept., the "Aeromodeller," The Aerodrome, Billington Road, Stanbridge, Beds.

FOR SALE

"E.D." Diesel 2 cc. for sale, brand new, £3 10s. Bolton, 44, Merewood Avenue, Sandhills Estate, Headington, Oxford.

Nylon covered duration plane, powered by new "Ohlsson 60," placed Midland Area Rally. £18 10s. or offers. 50 m.p.h. Keil Kraft "Phantom" with hot Mills, £9. Condition guaranteed. Howard, 145, Brooklands Road, Sale, Cheshire.

"Stentor" 6 c.c. engine, "Frog 175," untouched "Condor Clipper" and Aeromodels "Messenger." Kits for Electric Gauge "00" Train set or loco. Beel, Court House Farm, Great Rollright, Oxon.

Foursome C.I. engine, as advertised on page 95 of December "Aeromodeller," perfect condition and excellent starter. £4 5s. or offers. 33, Richmond Buildings, Brighton, Sussex.

26 copies of American journal "Flying" from Feb., 1944, to May, 1946 (2 missing), very good condition. 35/-. Bramwell, 1, Dyke Road Drive, Brighton 6, Sussex.

Brand new "Eta" 5 c.c. diesel, bench run only. Nearest £6 10s. Nosworthy, 35, Mirador Place, Mount Gold, Plymouth.

"Frog 45," fitted ·099 "Arden," Smith coil, condenser. Ready to fly. Offers. Harding, 58, Ward End Road, Ward End, Birmingham 8.

"E.D." Diesel, bench run 25 mins. with prop. £3. Wooldridge, "The Dell," Kingfield Road, Woking, Surrey. 'Phone 605.

"Arden" ·099 coil condenser, 2 plugs, 2 props., £10. "Micron" 2·8, £8 10s. "Kemp" 1 c.c., £5. All engines bench run only and in perfect order. Macintyre, 55, Brockley Park, Forest Hill, London, S.E. 23.

"Stentor" engine as new, not used since thorough overhaul by makers. Complete with coil, condenser, prop., new plug, £6 6s. Hooper, Lusty Glaze, Newquay, Cornwall.

"Frog 175" engine, electrics, timer, £3. "Frog 45" kit £1 10s. "Flying Minutes" kit 15/-. "Son of Trike" kit 7/6. Lockton, 188, Nettleham Road, Lincoln.

A.P.S. Peres I 10 ft. Sailplane, Nylon covered. Best offer above £8. Details on request. "Air Reviews" Jan. '47, Nov. '46, 2/- each. "Aeromodellers," Jan. '44-'47, 6d. each. A.F.P. Vol. 4 10/-. Allanach, 99, Cross Flatts Avenue, Leeds 11.

Frog "45" with "175" motor, timer. Brand new, fine construction. £7. Sale due to call-up. Wiggin, 305, Old Farm Avenue, Sidcup, Kent.

"Aeronautics." Vol. 12, Nos. 1, 3, 4, 5, 6. Vol. 13; Comp. Vol. 14, Nos. 1–4; Vol. 15 Nos. 2–6; Vol. 16; Comp. Vol. 17, Nos. 1–4. Anson, Osgodby, Selby, Yorks.

"Qwat" 5 c.c. diesel, hardly used, £6 or offers. N. Broadbent, 48, Sunnybank Road, Greetland, Halifax.

"Aeroplanes," March, 1942, to date, "Flights," "Aeronautics," "A.F.P." Vols. 5, 6, 7, "A.W.A." 1945/6. Lot £10 or offers. Holden, 39, Lymington Road, Wallasey.

"A.F.P." Vols. 3, 5, 6, 7, perfect condition. Best offer over £5 secures. Standley, 27, Elmgrove Road, Gorleston-on-Sea, Suffolk.

"Mechanair P.I." (5·9 c.c.), brand new, with prop., coil, 2 plugs and condenser. Best offer above £7. Cunliffe, Kentmore, Borrowcop Lane, Lichfield, Staffs.

Small parts machined up to 3½ in. lathe. Send your material or that odd job. S. A. E. Mackrell, "Red Tiles," Anna Valley, Andover, Hants.

Two received for Xmas, "E.D." Mark 2 and flywheel for sale. Not used. Will accept £3, cost £4 14s. 6d. Box No. 109.

"A.F.P.," Vol. VIII, and "Design and construction of Flying Model Aircraft," Unused. Offers. A. Butler, Birks Barn, Stretton, Stafford.

2 valve receiver, ear phones, loud-speakers, extra valve, few wireless components, books, magazines on Radio Carpentry, Aircraft Recognition. Offers over £4 10s. Box 110.

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TRADE

"Aeromodeller" back issues can be obtained from W. H. Forway, Elizabeth Villa, Coventry Corner, Hockley, Essex. Early copies bought.

All American magazines available, post free for one year. "Air World" 12/–, "Model Airplane News", 16/–, "Flying Models," 21/–. "Life" (International) 40/–, etc. For list of all other American magazines send S.A.E. to Willen Ltd. (Dept. 65), 120, St. George's Road, London, E.10.

Large quantity of perspex, 17 ins. × 17 ins., one side opaque, 1/16 in. thick., 3/6 per sheet, carr. paid. Gillard, Fitzmaurice Road, Christchurch. Tel. 1451.

American Magazine Subscription Service. "Air Trails," 19/– per year, post free, "Model Airplane News," 16/–, "Air World," 10s. 6d., "Flying Models," 20/–, "Model Railroader," 25/–, "Popular Mechanics," 17s. 6d., "Popular Science," 20/–, "Science and Mechanics," 12s. 6d., etc. Send P.O. to Burnley Model Supplies, Parker Lane, Burnley. (S.A.E. for complete list.)

For disposal 1,000 gross 3½ in. × 9/16 in. taper nozzle lead tubes, and 1,000 gross 2½ in. × 9/16 in. Astral Aero Model Co., Dixon Lane Road, Wortley, Leeds, 12. Tel. 37021.

"Wildcat" 5 c.c. diesel part-machined engine kits, specially produced for modellers who do not possess lathes. 62s 6d. Send S.A.E. for full information. Davies-Charlton & Co., 13, Rainhall Road, Barnoldswick, via Colne, Lancs.

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American magazines, "Model Airplane News," 16/–, "Flying Models" 20/–, etc., particulars S.A.E., Hockenhull, American Publication Agents, 510, Crewe Road, Wheelock, Sandbach, Cheshire.

Designed to absorb and balance engine stress, vibration and torque—use "Ace" engine mounts (Ref. Dec. issue, p.94), price 2/3 plus 3d. postage per pair—from "Ace" Model Aircraft Products, 7, Tolworth Road, Surbiton, Surrey.

WANTED

"Air Review," vol. 1, Nos. 1, 2, 3, 8; vol. 8; Comp. vol. 9, No. 1; "Aeromodeller," vols. 1, 2, 3, good condition. Anson, Osgodby, Selby, Yorks.

2 square feet plywood, each 1 m.m. 1/16th, 3/32nd, 1/8th, ¼, state price. Taylor, 8, Laurel Crescent, Keighley, Yorks.

Early pre-war issues of "Flight" and the "Aeroplane." L. A. Clark, 28, Belle Vue Avenue, Doncaster, Yorkshire.

"Super Tigre" and "Super Delmo" diesel engines wanted. Good price given or exchange with American motors. Ted Buxton, 59, Oakwood Drive, St. Albans, Herts. Tel. 1433.

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Webley ·177 Air Pistol. Nearly new, 1,000 pellets, washers, etc. For diesel or £5. R. Betley, 30, Harding Street, Crewe, Cheshire.

"Ohlssons 19," new, "23" used, good condition. Both rotary valve, metal tank. New "Hurricane." Any one or all for American, German, or Swiss folding or miniature camera, prefer photoflash. Air Mail, Eric Williams, Route One, Greenville, Ohio, U.S.A.

We regret having to cease publication of our plans and booklets of the Golden Hind and Santa Maria Galleons at the request of Messrs. Jarrett, Laughton & Rainsford of Birmingham who claim Infringement of copyright, and to whom we offer our apologies for any inconvenience caused.

In fairness to ourselves we would state that these drawings were prepared for us by a free lance artist and we were not aware of the source of his information at the time.

New designs are now being prepared to replace those complained of and we ask our customers' confidence and understanding in the unfortunate position in which we have unwittingly been placed through no fault of our own.

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