MODEL AIRCRAFT

Build the SHORT SEAMEW

— Constructional details inside

1'6

AUGUST 1955

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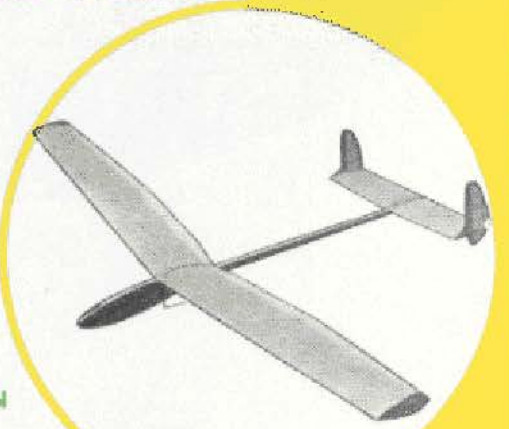

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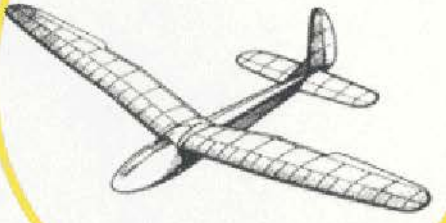

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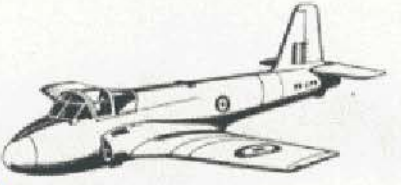

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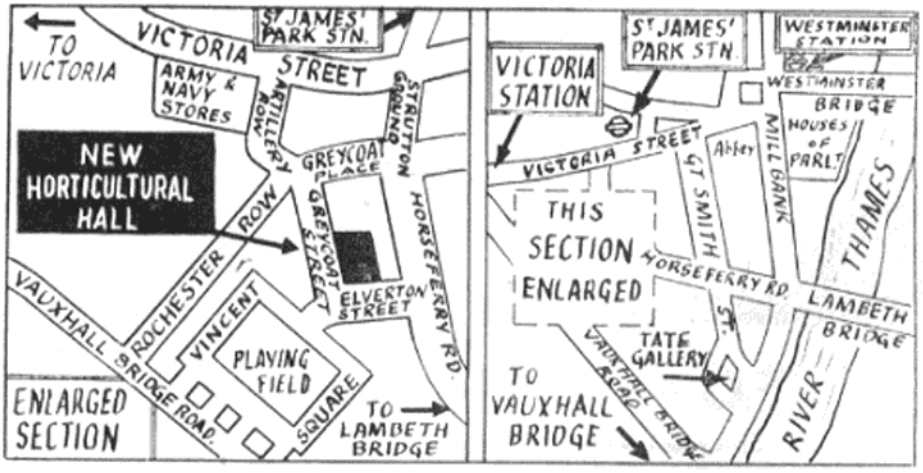

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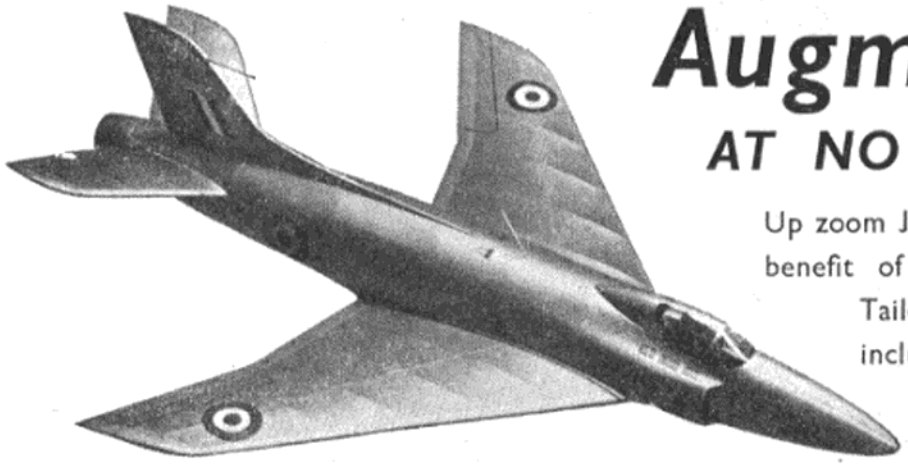

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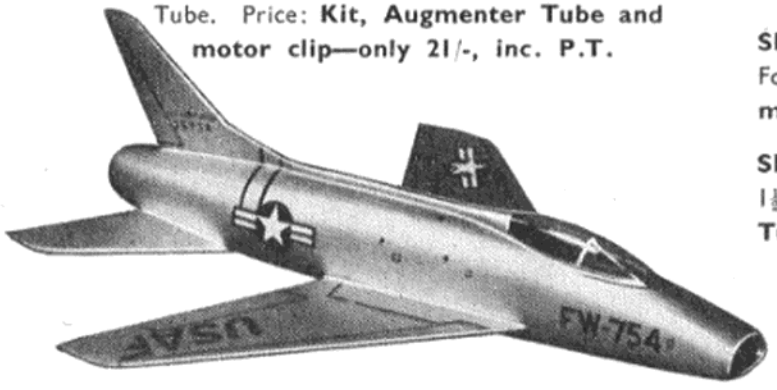

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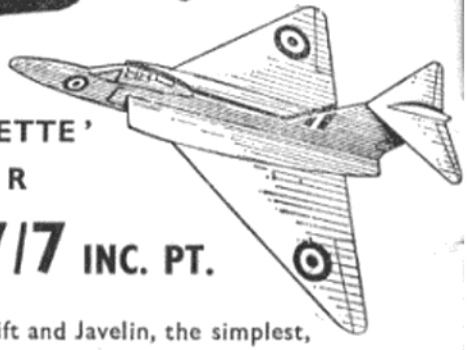

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AUGUST 1955 No. 170 VOL. 14

Contents

Cover Story

Since its first appearance at the Farnborough Air Show, the Short "Seamew," by reason of its simplicity of design coupled with comparatively low cost, has naturally been of great interest to those countries in the N.A.T.O. group. Furthermore, these factors have not been achieved at the expense of effectiveness but mainly by an entirely different approach at the initial design stage. We gratefully acknowledge the assistance we have been given by the Editorial Department of Short Bros., who also supplied the photographs for our cover and article.

THE JOURNAL OF THE SOCIETY OF MODEL AERONAUTICAL ENGINEERS

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Letters TO THE EDITOR

The Frozen North ?

DEAR SIR,—AS MODEL AIRCRAFT is the official journal of the S.M.A.E., I would like—on behalf of my club mates—, to air a grievance brought up continually at our meetings.

We live in the north-east and naturally are members of the North-Eastern Area. It is the definite opinion of *all* our members (and most members of our neighbouring clubs) that the S.M.A.E. has failed as far as the North is concerned.

Most of us joined to enter contests, and we had decentralised ones at least, but even these are now being centralised and tacked on to the Nationals. Also we understood that this important rally was to be brought to everyone eventually. It moved to Cambridge and seems to have stuck there. I can think of few worse places to hold a centralised contest for amateur sportsmen.

To sum up: The policy of the S.M.A.E. in holding the majority of its contests in the South has almost strangled interest in the North. The number of decentralised contests decrease yearly, and owing to the low numbers of supporters, the semi-centralised contests up here are a shambles. This discourages even more modellers, hence decreasing interest.

We claim that the clubs have too little say in the decisions made by the S.M.A.E. Council—it is not democratic enough. After all, the only time the average club member can have anything to say is at the A.G.M. held in London. How many modellers can afford the time and/or money to go to the capital for a meeting?

One idea is this. The Council should receive items for its agenda from individual clubs. Two clubs should propose them, then the Council discusses them only. Its recommendations will be sent to each club for voting on. Only this vote would count, votes would have to be sent in within 15 days. Only the spending of money and ratifying records and similar things would be left to the Council. No one could complain and interest in the S.M.A.E. might be revived. Voting procedure needs discussion; the choice seems to be between one vote per club or one vote per 15 members. Country members would be a problem.

We (Seaham D.M.C.) would welcome correspondence on these topics.

Yours faithfully,

Seaham D.M.C. W. E. HUME.

THE INTERNATIONAL TEAMS

THE recently held trials to select the teams to represent Great Britain in the international competitions have produced a side that shows promise, in that each team has members who are experienced in international flying events, names that consistently appear high in the contest results and some "dark horses"—and from knowledge of previous competitions, members from the latter category often do well.

In the Wakefield, Frank Holland is the most experienced member having been in the team in 1949 and 1951. John O'Donnell, who placed second, was in the 1953 team and this year is also in the glider (Max Byrd first obtained a "double-cap" in 1952).

Pete Buskell holds a unique position in the power, by having been a team member each year since 1952, when Britain first entered international power flying.

In the A2, besides J. O'Donnell (who narrowly missed a place in the 1953 team) is Des Yeabsley, who with his twin brother Roy has featured high in competition results for many years. The results and pictures of the trials are on page 304.

The total of thirteen (we hope that none of the team members are superstitious) will travel to Germany to compete in the World championships which will be held at Finthen Airfield, an army aerodrome used by the French as a training school. Accommodation and meals will be at Wiesbaden Air Base and U.S.A.F. buses will take contestants to and from Finthen Airfield.

This meeting will be sponsored by the U.S.A.F. Headquarters in Europe in co-operation with the German modelling organisation. The Aleutscher Aero Club e.v., the equivalent of our Royal Aero Club, have appointed Heinriche Pempe as the German co-ordinator, while Marjorie Miller, Chief of the Recreation Branch, H.Q. U.S.A.F.E., will handle the U.S.A.F. liaison side. The A.M.A. will also be present.

Permanent home for Antoinette monoplane

THE famous Antoinette monoplane, which has been on loan to the Science Museum, South Kensington, since 1926, has now been presented for permanent inclusion in the National Aeronautical Collections by Mr. Robert Blackburn, chairman of Blackburn and General Aircraft, Ltd.

The aircraft's full title is the "Antoinette 1910 Model," and is the only one of this make and type now in existence. Hubert Latham brought it to this country in 1910, after his attempts to cross the English Channel with earlier types of this machine.

As a matter of interest the Antoinette was featured in our August, 1950 issue in the "Prototypes Worth Modelling" series, and copies of the 1/72nd scale plan, SMA. 3, in our catalogue, are available from our Plans Sales Department, price 9d.

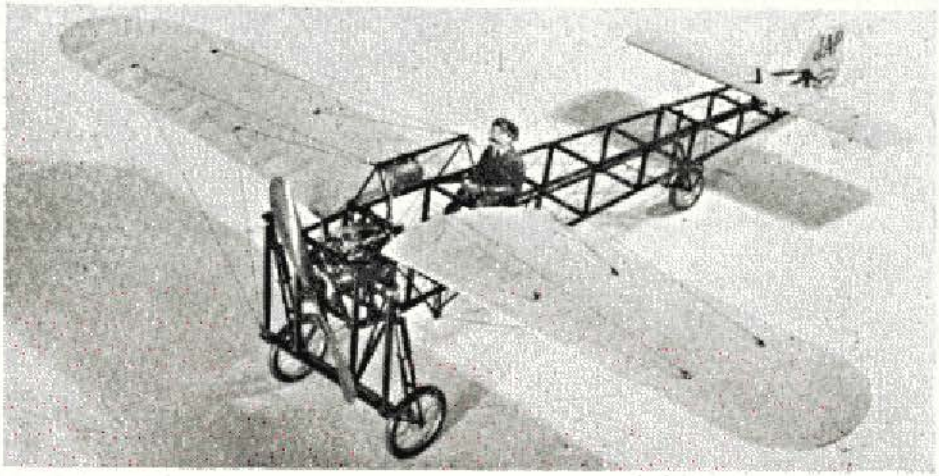
During its time, it was recognised as being beautiful in design and graceful in flight and, unlike most of its contemporaries, could fly in bad weather, as Latham ably demonstrated at the first Blackpool Air Meeting.

REPLICA OF HISTORICAL MACHINE

A CONTEMPORARY of the Antoinette and Bleriot machines in the Science Museum is the J. A. P. Harding monoplane. In many respects it was similar to the Bleriot XI, but it had a unique method of controlling the flight by the bracing.

Mr. J. A. Prestwich would have attempted a cross-Channel flight some six months earlier than Louis Bleriot, had a garage door not been blown on his aircraft during a gale, and completely wrecking it. Such were the misfortunes and hazards that the earlier aviators had to face!

The scale model seen in our photograph was built by Westway Models Ltd., for Mr. Prestwich and is constructed almost entirely of metal. The wing, which has a chord of 4 in., is covered with parachute silk and doped with Durofix, and sprayed a light cream colour. The spoked undercarriage wheels have a diameter of $\frac{3}{4}$ in. and the 1 in. long engine was a minor engineering feat, being complete with all visible external detail.



Modeller Turns Film Star

MORE recruits to the model aircraft hobby are assured when a film featuring flying models on Epsom Downs is shown to young audiences later this year. Recently we were given a preview of this film in its unedited form and before the commentary had been dubbed in.

Always a big attraction at any large flying meeting is P. E. Norman and his fine collection of flying scale models, consequently it was no surprise to find that the star of this short was the " Scale King " himself.

The opening scenes show P. E. with two young companions—who have an inquisitive turn of mind—examining a variety of types ranging from his well-known Bristol *Bulldog*, to the ducted fan *Cougar* illustrated in our March issue. After explaining a number of points to the youngsters, P.E. puts on a flying show that for realism would be hard to better. The *Cougar*, especially, looked convincing as it climbed, leaving a faint smoke trail to the rear.

Altogether good entertainment and a film which undoubtedly will assist in promoting air-mindedness among the youth of the country.

METEOROLOGY For the Layman

APART from the final results, about the only unpredictable aspect of a flying meeting is the weather one may expect on the all-important day. True, forecasts issued by the B.B.C. and those printed in most newspapers offer a general guide, but detailed information is often lacking. However, a most useful little book, " Your Weather Service " has recently been published by H.M.S.O. price 1s. 6d. and one we suggest would be a useful addition to any model flier's bookshelf.

Not only does it give the background picture of how a modern forecasting service works, but also details the public and personal services available for organisations and individuals. Thus, for only a small charge and no " red-tape," a club holding a flying meeting could obtain a special forecast for the particular area in which it was being held.

Furthermore, research is still going forward, and at the present time attention is being given to the application of electronic computing machines in formulating tomorrow's weather map. Study is also being made on weather changes which affect periods of more than five days, and the results will provide a basis from which it can be ascertained whether accurate forecasting is possible on a scientific basis for periods of a week or even a month ahead. Obviously, if such long range forecasting can be proved accurate, all our flying meetings will be held on our two fine weekends !

One section deals with how to interpret weather forecasts, and the appendices are crammed full of useful facts, figures and diagrams—all presented in a way that can easily be understood by the layman. In fact, the book's basic approach to what is, of course, a highly technical subject, is symbolised by its front cover—an umbrella handle imposed on a cloud background, which at the same time underlines the remarkable capriciousness of the British weather !

WIESBADEN TEAM WON TROPHIES —and home visit

A 21s. 7d. kit model and an Allbon Dart motor helped to make S/Sgt. Warren J. Godden top man at the 1955 U.S.A.F.E. Model Aeroplane Contest held at Wiesbaden over a recent weekend.

From this contest 12 team members were chosen to represent U.S.A.F.E. (United States Air Forces, Europe) Command at the Air Force World Model Aeroplane Championships held in the United States from July 11th to 16th at Travis A.F. Base in California. Eligibility for the team, which was flown over to the States, was determined by the individual's ability and position in the final results.

Judging the comprehensive programme of events were E. F. H. Cosh, H. G. Hundleby and H. J. Nicholls.

S/Sgt. Godden, depicted above, won the F/F scale contest with a beautifully made KeilKraft Cessna 170 powered by an Allbon Dart diesel, and also came first in the B-class speed event.

At a dinner following the contest Lt. Col. John K. Pepper of U.S.A.F.E. presented trophies to all the winners.

ASSOCIATES can PARTICIPATE

ASSOCIATE members of the S.M.A.E. living in or near London can now have a say in the affairs of the Society. They are invited to attend the monthly meetings of the London Area Committee, held on the second Monday of each month, 7.30 p.m. at the Horse Shoe Hotel, Tottenham Court Road, W.1.

The committee feels sure that there must be many Associates in the area who could become really active members, and those interested should contact K. J. Muscutt, 281 Capworth Street, Leyton, London, E.10, who will be pleased to give them further information.

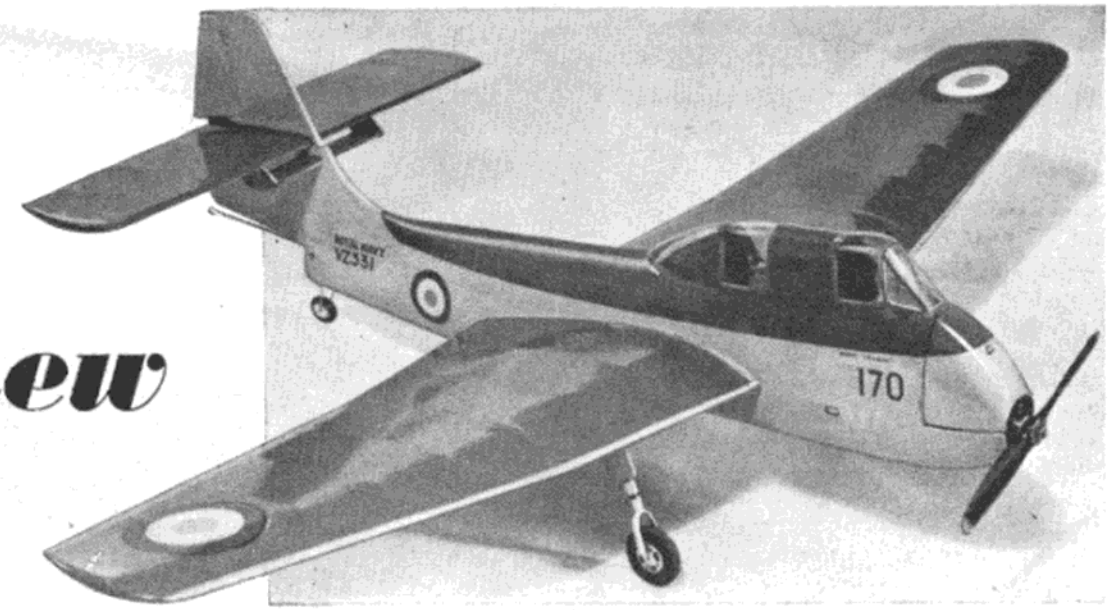
A SUCCESSFUL FLYING SCALE MODEL OF AN UNUSUAL PROTOTYPE POWERED BY A HALF C.C. MOTOR

★

The Short Seamew

★

by Eric Fearnley



IT is not often that we can get down to modelling and flying a "restricted list" Royal Navy type and power it with the simple Dart and a 6 × 4 in. plastic prop. in these days of multi-engine and jets types. However, in the Short *Seamew* we are fortunate in having a prototype using the Siddeley Mamba turboprop engine, so that although we have a jet orifice and tube (used in the model to form a fuel exhaust and backbone at the same time), we also have a propeller for flying purposes.

Do not be misled by the rather unusual aerodynamic form of the model—it has in fact great stability in flight, and will glide some six or seven times its height from a hand launch when properly trimmed. Directionally stable, its high fuselage gives a high CLA—which is better than dihedral and it also has great strength in its simple outline. Weakness in having a close coupled tail is well compensated by the enormous wing chord, which acts in the best flying-wing tradition, minimising the work of the tailplane. In addition, the actual tail area is extremely large.

Provided reasonable care is used in setting the tail as indicated on the plan no trouble should be experienced in trimming the model. The main thing is to trim the tail to the flattest glide possible, and then add down thrust to dampen the stall under power. Mine needed two washers under the back bolts holding the Dart to get an uneventful power-on flight path, which is quite considerable. This is caused by having the mainplane at low incidence for building ease, plus a very low thrust line. Even when stalling, however, my model maintained a straight trim, refusing to fall off on a wing and spin as so many low wing types tend to do. This is the position of the CLA again, of course.

The prototype balanced just behind the wing mainspar, and needed no weight adding; however, this may not be so with some models as with colour dope trim, heavyweight tissue, and fuel proofer it is slightly in the heavyweight class. A less elaborate model will be much lighter, and have an even better flight performance. The Dart has more than enough power for the model, and needs keeping throttled back about quarter of a turn on the compression lever from the "hot" position, at least until a satisfactory trim is established.

Fuselage

The basis is a paper tube which is made by soaking stiff paper (I used single weight photographic paper) for a few minutes, and wrapping it round a ½ in. dowel with strip elastic; remove and cement along the join. 1/32-in. balsa sheet could be used instead if desired. Cut the formers out of 1/16-in. balsa. A ½-in. punch can be used for the tube holes, if they are sanded slightly larger to allow for the thickness of the paper. Assemble the formers on the tube where indicated, making sure that they are in line when viewed fore and aft. Add the box to take the wing stubs on top of the tube, cementing thoroughly all round, adding the strengthening pieces where shown.

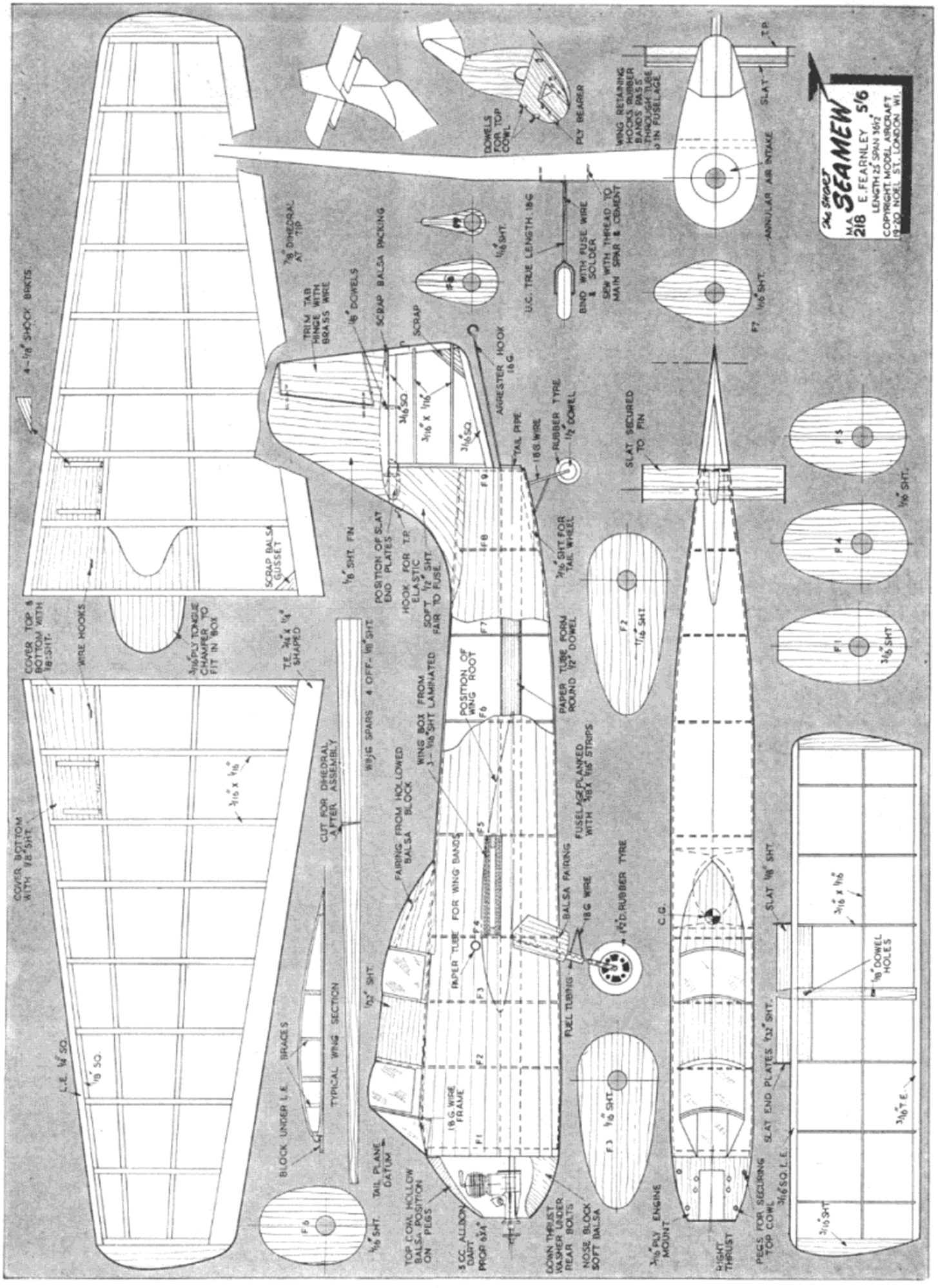
Plank the fuselage with ⅜ in. × 1/16-in. strips, and use elastic bands and plenty of pins to keep in place. Don't spare the cement around the nose and wing box.

Add the fairings, cockpit details, and nose blocks; the motor mount is plywood. Add the fin and line up carefully at right angles to the wing box. Dope on tissue in strips, sand well and dope again.

Because of the tremendous chord they are made by the cap strip method. Pin the mainspars—cut from ⅛-in. sheet, but without the dihedral cut—over the bottom strips of ⅜ × 1/16 in. which are first fastened to the plan. Trim and fit the trailing edge. Prepare the leading edge from ¼ in. sq. with ⅛ in. sq. cemented to the back to form a "T" section. Cement this to the bottom strips. When dry, raise the leading edge to the amount shown, and add the top pieces or cap strips of pliable wood. Before removing from the plan, add small vertical strengtheners, as shown, to each wing rib. Finish with the sheet at the centre section and where the undercarriage fits, also the tips. Sand well to finish.

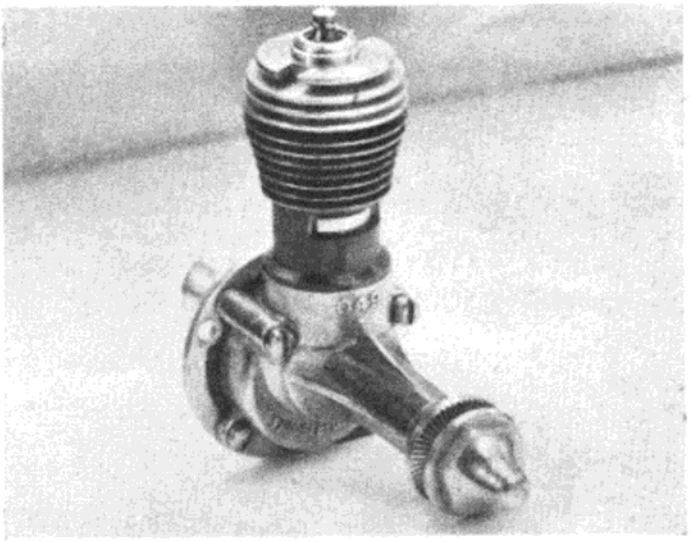
Cut out two wing tongues from plywood, and fit to the centre part. Be sure that they are both at the same angle. Double check this point if you want a *flying* model. Notice that the tongues overlap inside the fuselage; the top is bevelled off on one side and the corresponding bottom off the opposite one. They should lock in the fuselage nicely if made properly. Now break spars and cement with correct dihedral angle. A paper tube passes through the fuselage above the top to take a

(*Continued on page* 323.)



FULL SIZE WORKING DRAWINGS ARE OBTAINABLE FROM YOUR LOCAL DEALER, OR BY POST FROM THE "MODEL AIRCRAFT" PLANS DEPARTMENT 19-20, NOEL STREET, LONDON, W.1, 5s. 6d., POST FREE

Engine Tests



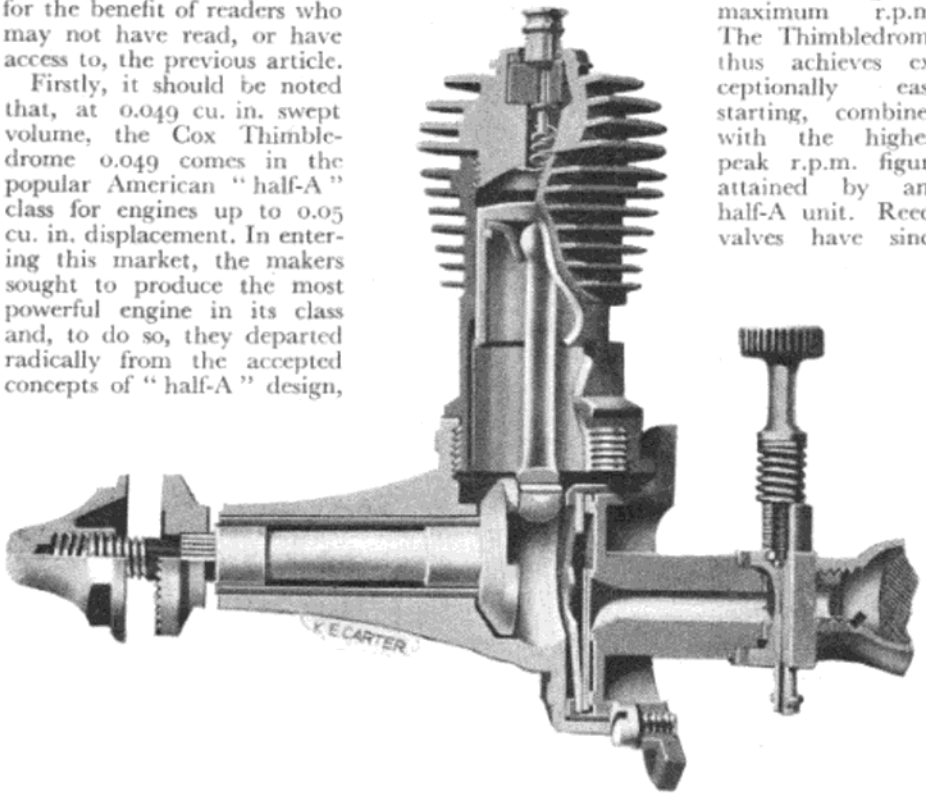
No. 76. The Cox Thimbledrome .049 c.c.

So far, this year, we have dealt, in the Engine Tests series, with seven engines from five different countries: three from Great Britain and one each from Germany, Italy, Norway and Japan. This month we have another overseas product in the shape of the Thimbledrome 0.049 "Thermal-Hopper" engine made by the L. M. Cox Manufacturing Co., Inc., of Santa Ana, California, U.S.A.

The Cox 0.049 was first described some two years ago in "Accent on Power." A technical assessment of the design, including an account of the characteristics of the reed-valve system of induction, was contained in this article (MODEL AIRCRAFT, September, 1953) and we shall not, therefore, give a detailed description here. However, a summary of the notable features of this outstanding miniature i.c. engine follows for the benefit of readers who may not have read, or have access to, the previous article.

Firstly, it should be noted that, at 0.049 cu. in. swept volume, the Cox Thimbledrome 0.049 comes in the popular American "half-A" class for engines up to 0.05 cu. in. displacement. In entering this market, the makers sought to produce the most powerful engine in its class and, to do so, they departed radically from the accepted concepts of "half-A" design, which, hitherto, had included, almost exclusively, shaft rotary valve induction and annular cylinder porting. The first Thimbledrome 0.049, produced three years ago, was the "Space Bug" model aimed at the C/L field. It was afterwards followed by the "Thermal-Hopper," a F/F version of the same engine, which is the subject of our present test.

The first unconventional feature of the design is, of course, its reed, or flutter-valve, intake system. Used for some years by American outboard motorboat engine manufacturers, the reed-valve consists, essentially, of a simple spring flap over the crankcase induction port, which is thus operated by atmospheric pressure and is, therefore, more readily adaptable to the widely different induction timing ideal requirements between starting and maximum r.p.m. The Thimbledrome thus achieves exceptionally easy starting, combined with the highest peak r.p.m. figure attained by any half-A unit. Reed-valves have since been seen on a few other engines, but the design of the Cox reed-valve housing and carburettor unit remains the neatest and most reliable yet encountered.



The carburettor, although of the needle-valve type, is unconventional, in that three jets, placed at 120 deg. intervals, lead into the choke tube, fuel metering being controlled by a needle-valve which is quite separate from the jets.

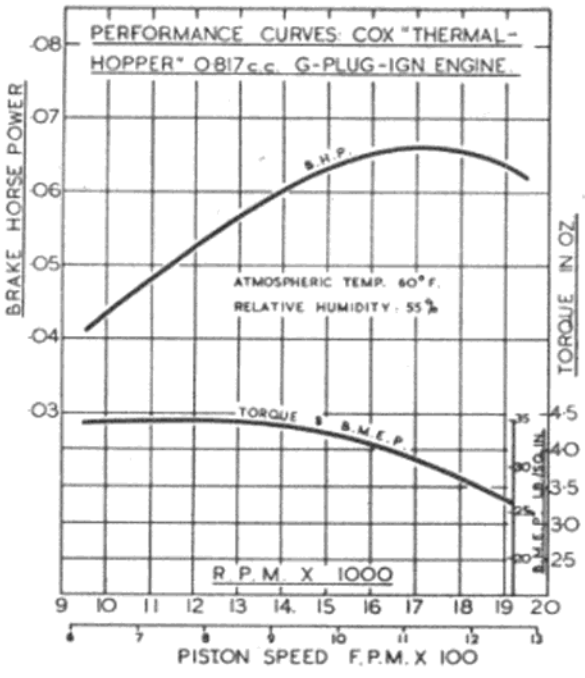
The construction of the engine is of the very highest order. It is the only lapped piston production engine so far produced, in which the pistons and cylinders are finished to such close tolerance that these components are interchangeable and do not require to be selectively matched during assembly. The crankcase is a diecasting of unusual accuracy and finish and contains a bronze bushed main bearing. The crankshaft is beautifully made, with a relieved main bearing centre section to provide two $\frac{3}{16}$ in. × $\frac{3}{16}$ in. dia. journals and has a crescent counterbalance machined in. The lightweight steel piston, which is hardened, ground and honed, employs a ball and socket small end joint.

The Cox cylinder is a one-piece unit with machined-on fins and has a blued finish. The alloy cylinder head screws into the top of the bore and provides a hemispherical combustion chamber shape unspoiled by glowplug interference, since the ignition element is built into the head itself. If and when the element becomes unserviceable, a replacement cylinder head is, of course, required, but this is obtainable from the manufacturers at no greater cost than a normal glowplug.

Specification

Type: Single cylinder, air-cooled, two-stroke cycle, glowplug ignition. Induction via crankcase reed-valve. Dual opposed exhaust ports and twin transfer grooves. Hemispherical combustion chamber. Rotation: clockwise or anticlockwise.

Swept Vol.: .817 c.c. (.049 cu. in.).



Bore: 0.406 in. Stroke: 0.386 in.
Compression Ratio: (standard) 6.5 : 1
Stroke/Bore Ratio: 0.951 : 1.
Weight: 1.35 oz.

General Structural Data

Diecast aluminium alloy crankcase with phosphor-bronze main bearing bush. Heat treated alloy steel cylinder with integral cooling fins, blued for protection against corrosion. Hardened ground and honed steel piston with ball and socket connecting-rod attachment secured with circlip. Aluminium alloy connecting rod. Balanced crankshaft with machined-in counterweight, and with separate front and rear main journal surfaces. Aluminium alloy cylinder head with built-in ignition filament. Machined alloy crankcase backplate in unit with carburettor body and forming base for reed-valve components. Two copper-berrylium reeds retained by special steel backplate and alloy ring housing. Separate needle-valve body metering fuel to three carburettor jets. Needle-valve complete can be rotated through 360 deg. for any convenient installation angle. Carburettor has gauze air filter. Three point radial mounting.

Test Engine Data

Running time prior to test: 20 min. only (see text).

Fuel used: 50 per cent. blending methanol, 25 per cent. castor oil, B.P., 25 per cent. nitro-methane.

Ignition equipment used: Maker's integral glowplug head (1.6 volts used to start).

Performance

One of the features of the Thimbledrome 0.049 is that, due to the exceptional finish of the working surfaces, the engine requires virtually no running-in period. The makers state, in fact, that the motor may be operated at full power following only *one minute* of rich mixture operation. A nominal running-in period of only 20 min. was therefore given before our dynamometer test.

Starting is as easy as one could wish. No priming is necessary and the engine will start from cold by merely choking the intake just as soon as any thickened residual oil is dispersed. Restarting the engine hot is instantaneous; we did not even bother to connect the glowplug for this but merely touched the lead on to the terminal with the left hand while flicking the prop once with the right. This case of starting is obtained irrespective of load. To check this, a light 5 in. dia. propeller was fitted, allowing r.p.m. to reach some 22,000 and still no difficulty was experienced.

The running qualities of the engine are first class. It is vibration-free and consistent, especially at the highest speeds. The rearward location, easily adjusted to any convenient position of the needle-valve control, is very helpful. The adjustment to find optimum performance is fairly critical but the needle holds its settings firmly at all speeds. Carburation is undoubtedly very efficient on this engine and the only disadvantage of the jet design is the tendency for these to clog easily if any foreign matter is present in the fuel. An obvious precaution here is effective filtering.

Dynamometer tests for the present report on the Thermal-Hopper were carried out without any special regard to matching compression ratio and fuel to atmospheric conditions (factors having considerable influence on Thimbledrome performance) and it is considered that the maximum output recorded of 0.066 b.h.p. at approximately 17,200 r.p.m., while appreciably above the best figures previously recorded for 0.049 cu. in glowplug engines, may, in fact, be pushed up to *circa* 0.08 b.h.p. at 18,000 r.p.m. under favourable conditions. It will be observed that torque, reaching a b.m.e.p. equivalent of 35 lb./sq. in., is up to 30 per cent. higher than previous figures for half-A glowplug engines.

Specific output (as tested): 88 b.h.p./ltr.

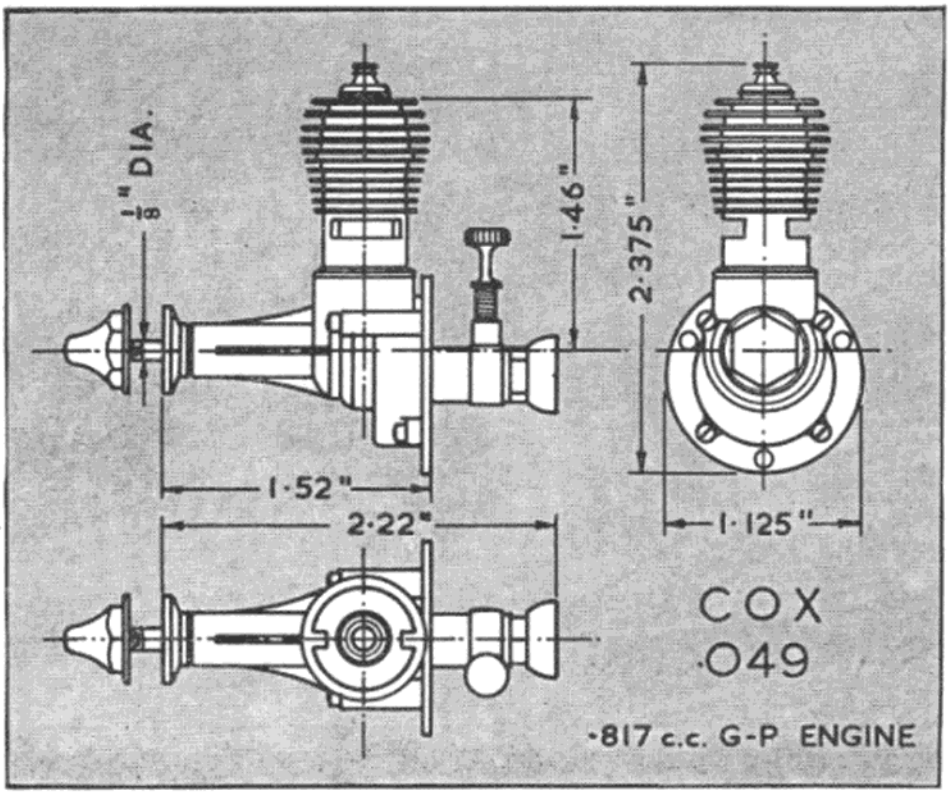
Power/weight ratio (as tested): 0.766 b.h.p./lb.

Engine Materials—2

Case-Hardening. The process of modifying the surface structure of a low carbon content steel by carburising (June issue) and quenching, in order to produce a hard wearing exterior "case" The process is used where the use of brittle, high carbon content steels is impracticable. Thus, crankshafts, which must be of a tough and relatively ductile material, are frequently case-hardened on main journal and crankpin. An engine having ball bearings to support the crankshaft, however, may be hardened on the crankpin only.

Cast-Iron. Cast-iron appears in many different forms in model engine construction, notably for pistons, contra-pistons, main bearings and cylinder-liners, i.e., parts for which a hard wearing surface, rather than high tensile strength, is required. See also Centrifugal Casting, Meehanite.

Centrifugal Casting. Cylinder liners, etc., are sometimes referred to as being of centrifugal cast-iron. Centrifugal casting is the casting of metal under the pressure of centrifugal force generated by high-speed rotation of a special type of mould.

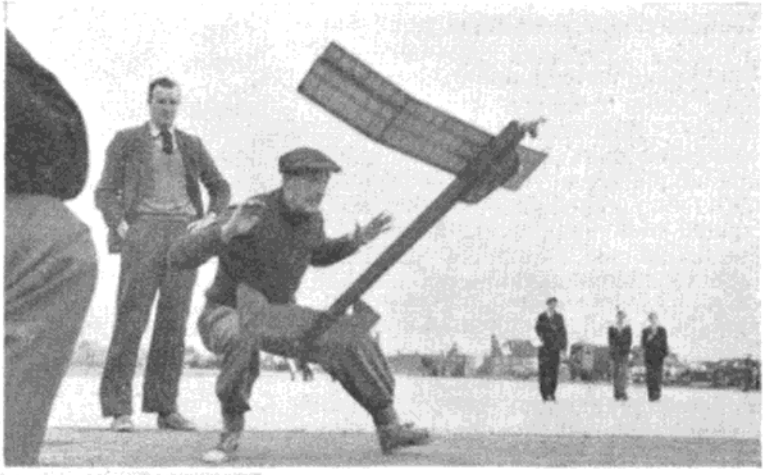


The TRIALS

HELD AT R.A.F. ODIHAM, TO SELECT THE WAKEFIELD, POWER AND GLIDER TEAMS TO REPRESENT GREAT BRITAIN IN THE INTERNATIONAL CHAMPIONSHIPS

CLIMATIC changes were as much a feature of the weekend at Odiham on June 18-19th as the constantly fluctuating position charts. Saturday, a warm sunny day, was devoted to the glider comp. and flying continued well into the evening, when max's were still being clocked. Finally, Geof. Lefever headed the list with 12 min. 59 sec., a 1 min. 4 sec. lead over second place winner John O'Donnell.

On the Sunday, the rain held off until mid-day, by which time the first three rounds of the Wakefield and Power comps. had been flown. A changing wind during the morning brought a switch in take-off points but the majority of the models were staying within the airfield boundary.



Using a lot of downthrust, D. Painter's Oliver powered model gets away to a fine start in one of the morning flights.

After lunch the two remaining rounds started in a drizzle which increased steadily as time went on. Despite the rain occasional maximums were still scored, although no one managed the full five in any competition.

The Wakefield provided plenty of tense moments and good flying in the last two rounds as the positions of the leading competitors changed—in fact it was not possible to forecast the composition of the team until the last few flights were made.

John Knight holds, while A. Parker protects H. J. Knight's model against the rain.

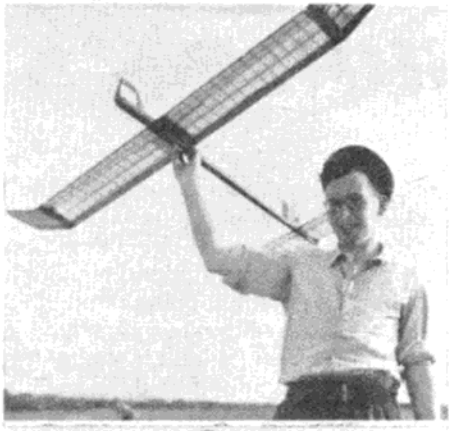
Just missing a place in the team, John Snewin flies in the last round.

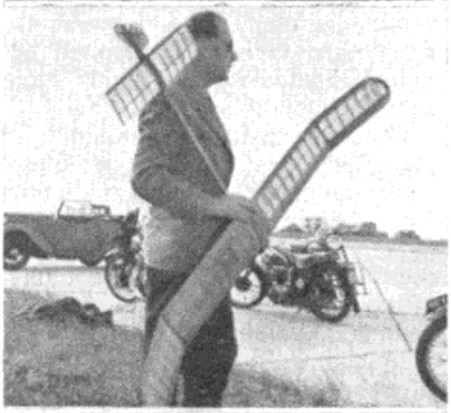
THE INTERNATIONAL TEAMS

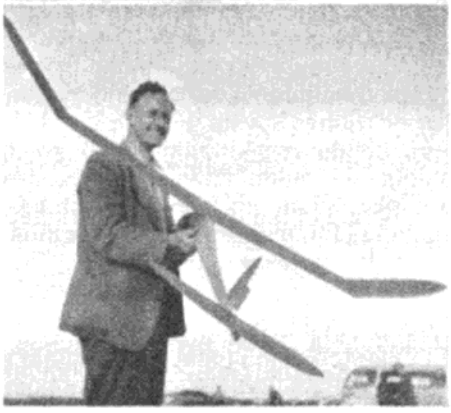
Wakefield *Glider* *Power*








1. F. Holland (Swansea)	14 : 27	
2. J. O'Donnell (Whitefield)	14 : 05	
3. P. Read (Birmingham)	13 : 38	
4. H. J. Knight (N. Kent Nomads) ...	13 : 35	

1. G. Lefever (Country Member) ...	12 : 59
2. J. O.Donnell (Whitefield)	11 : 55
3. R. Gilroy (Croydon)	11 : 49
4. D. Yeabsley (Croydon)	11 : 25

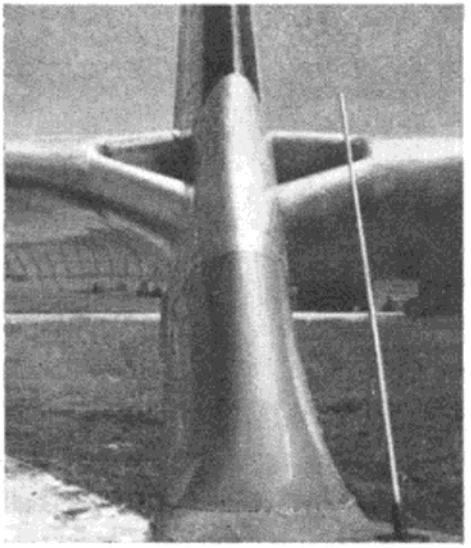
1. P. Buskell (Surbiton)	14 : 30
2. J. Parrott (Whitefield)	14 : 17
3. M. Gaster (Country Member) ...	14 : 13
4. A. Mussell (Brighton)	14 : 12

The SHORT SEAMEW

IN the present trend of aeroplanes becoming more and more complex resulting in increased size and weight, the *Seamew* represents a considerable achievement. Considerable not only for its simple construction and comparatively low cost, but also because it can perform duties currently undertaken by more elaborate and thus expensive machines.

Originally designed as an anti-submarine aircraft for operation from small escort carriers, the *Seamew* will also be operated by R.A.F. Coastal Command on in-shore anti-submarine patrols.

Just over 17 months elapsed between the design conception and the initial flight of the prototype (serial XA 209) on August 23rd, 1953, piloted by T. W. Brooke-Smith. Since then an intensive test programme has been carried out under all conditions likely to be met in operational service. These tests included a second aircraft, less engine and equipment, being tested to destruction to provide valuable data. As the *Seamew* is still on the "restricted" list, much of its interesting simplified constructional details cannot be disclosed, but it is known that the weight saving has resulted in a normal loaded weight of only 14,000 lb.



The tail intake on production "Seamews" has been considerably cleaned up.

Guiding hand throughout the *Seamew* project has been Short's chairman and managing director, Rear Admiral M. S. Slattery, C.B., D.Sc., F.R.A.E.S., who has always had a close association with naval air requirements. He and his chief designer, David Keith-Lucas, have produced an aeroplane which admirably fulfils the exacting requirements called for in an anti-submarine search and strike aircraft.

This type must be able to operate from the smallest escort carriers and improvised landing strips. As a result, the endurance needs to be high, the pilot must have the best possible view, and the aircraft must have a slow landing speed. In addition, by the nature of its role, it must have a high degree of manoeuvrability and carry an adequate war load.

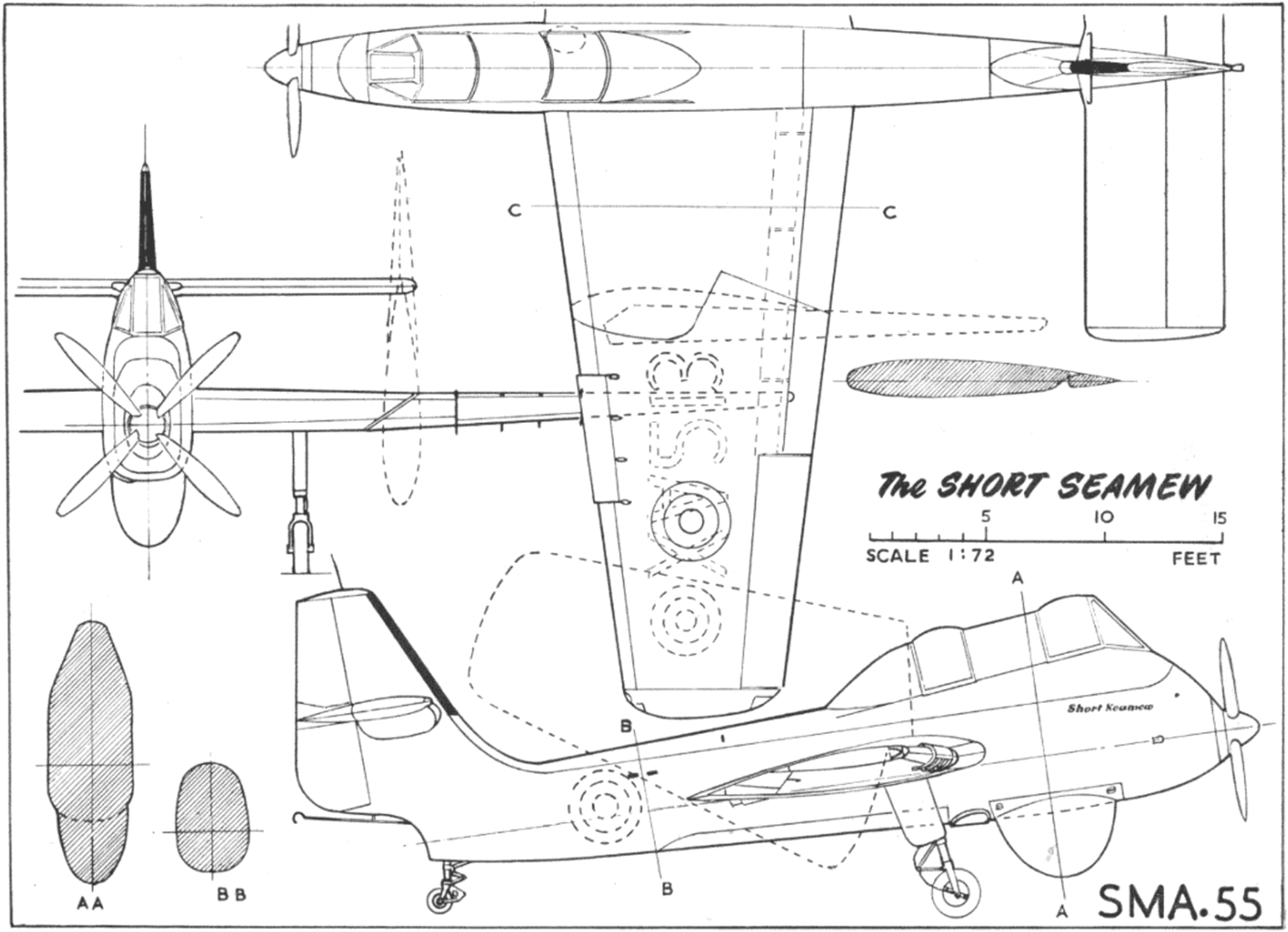
The *Seamew* certainly fits the bill with a few extra advantages thrown in for good measure. Operating the aircraft in adverse weather conditions calls for maximum aerodynamic control, and this factor, coupled with the need to limit the overall dimensions to facilitate carrier stowage, raised considerable difficulties, especially with regard to the elevator and rudder control at the critical landing speed. This problem was eventually overcome by incorporating a vented fillet in the tailplane, and a horn balanced rudder. To obtain the best possible stalling characteristics a small slot is incorporated on the leading edge of the wing.

One of a number of ingenious design features is the two-position tailwheel. The upper portion of the leg is a normal oleo, while the lower portion contains a dash pot which, when released, allows the tail-wheel to extend fully. Thus, in landing, the *Seamew* has a shallow angle of attack —almost equal to a proper tricycle undercarriage. On touch-down the dash pot compresses slowly, allowing the leg to retract by the end of the landing run. A catch automatically engages the leg to maintain a tail-down position for take-off.

Despite its stalk-like appearance, the fixed undercarriage is certainly a robust unit, and an added advantage is that tyres can quickly be changed to suit a particular terrain.

A search radome is positioned beneath the front fuselage and gives a 360 deg. sweep in azimuth. The sizeable bomb bay can house bombs

(*Continued on page* 330)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The SHORT SEAMEW
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THE NEW KEILKRAFT FACTORY

A TRANQUIL spot in rural Essex is perhaps the last place one would expect to find the headquarters and factory of one of the largest model aircraft firms in the world, but such was the case when recently we paid an informal visit to the new home of Keilkraft kits.

This was indeed far removed from the old factory in London's East End where in the thirties, Eddie Keil laid the foundations for what today is one of the best known firms in the model business.

But if the scene outside this handsome new factory gave the impression of a leisurely existence, the interior presented a vastly different picture. Perhaps symbolic of the firm's production capacity was the quarter of a million kits impressively stacked in their almost roof-high racks, awaiting distribution to home and foreign markets.

Keilkraft kits have not achieved their reputation for quality by accident—with the exception of rubber, all the components are either manufactured from the raw material or processed, by the firm itself; even the high quality balsa is now imported direct from Ecuador for them.

In one section of the main factory, injection-type moulding machines turn out propellers, spinners, cockpit covers and other plastic components. Other machines, some of them most ingenious and made on the premises, die-cut balsa, and form the many small metal parts that go to complete a kit.

The kits are packed on the assembly line system, the components being collected at one end of the line and distributed among the girl operatives for packing in the boxes. Such is the prodigious speed at which these girls work that kits are constantly on the move to the storage racks.

In an adjacent building is an up-to-date machine shop, where the high-grade balsa logs are sawn and shaped to every size. Special equipment is installed to extract the fine balsa dust from the machines. Picking out balsa sheet at random, we were impressed by the complete absence of flaws and irregularities.

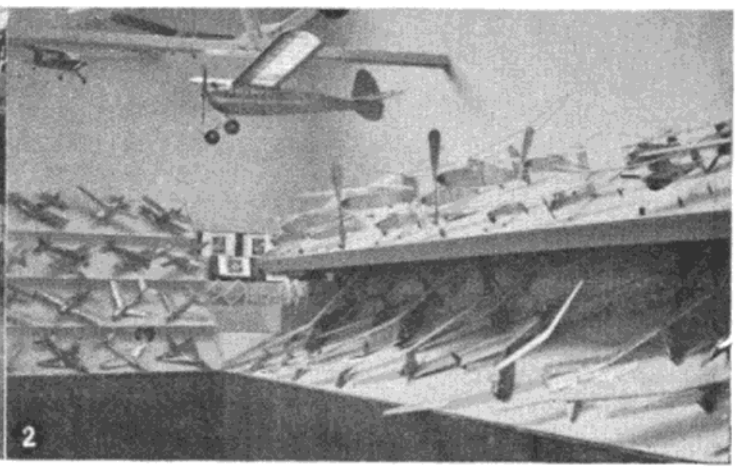
Although, as it was pointed out, the initial cost of such quality timber is high, the resulting cuts are the best possible, thus lessening wastage.

Over the administration offices is a very complete showroom, with an impressive array of the vast range of Keilkraft models, together with the accessories and allied equipment distributed by the firm. This range of models is one of the largest in the world, with new kits constantly being added. The latest shown to us was the *Nomad*, a 20-in. span towline glider that should prove to be a great success with the younger modeller. In fact the K.K. range has something for everyone, from the contest flier to the youngster whose " flying ground " is the front room—he is catered for by three small gliders, coloured and ready to press out from the one sheet, all for 9d. !

Many of the models in the showroom bore evidence of rigorous testing, and in point of fact all models are test flown by Eddie Keil himself before being put into production. And herein, no doubt, is the secret of the firm's success. Eddie Keil is a man dedicated to his work, with a tremendous enthusiasm for model aircraft and all things associated with the hobby, and the fact that he is no longer an active competition flier does nothing to lessen this enthusiasm. Also, with his brother Ronnie, who is a co-director and looks after the production side, he has a tremendous capacity for hard work.

Consequently he can be proud of his organisation and the guarantee of a square deal that goes with the name of every Keilkraft kit.

1



2

Heading picture. The front entrance of the new Keilkraft works. (1) Part of the assembly line where the kits are boxed. (2) A corner of the well laid-out showroom showing some of the Keilkraft range of models. (3) The packaging department where orders are despatched to all parts of the world. (4) An injection moulding machine producting small props in the plastics section. (5) Sawing balsa to length in the cutting shop. (6) Five gang saws used for cutting strip balsa. (7) Awaiting export, this huge consignment of orders is stacked roof high. (8) A section of the kit stock department where some of the quarter-million kits can be seen. (9) The raw material; part of a consignment of balsa wood waiting to be cut.

Aviation NEWSPAGE

by J. W. R. Taylor

PARIS SHOW REPORT

LATEST PARIS FASHIONS in aircraft, shown at the recent *Salon International de l'Aeronautique* at Le Bourget Airport, proved that French designers lack nothing in imagination and ability. In fact, French modellers ought to be the happiest in the world, with so many new shapes and new ideas to play with.

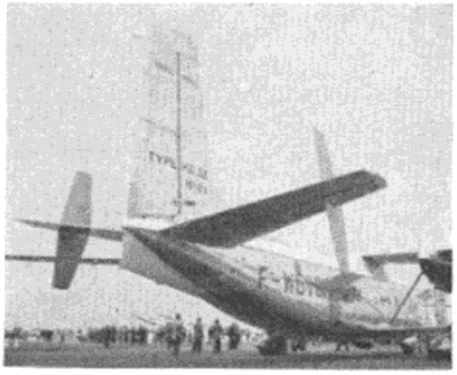
* * *

The **SIPA 1000 COCCINELLE** looks more like an ultra-large model than an ultra-light aeroplane. Spanning only 24 ft. 10 in., it is a handsome little two-seater, powered by an 85 h.p. Continental engine. Design work began on April 4th this year; construction started exactly one month later; and it made its first flight in mid-June.

No orange box with wings, despite its simple structure, the roomy cabin is sound-proofed and air-conditioned; the engine is fitted with a silencer; the sliding hood gives a superb all-round view; and it is complete with electric starter, dual controls, tricycle undercarriage and double-slotted high lift flaps. Take-off and landing run is 77 yards and the *Coccinelle* has a range of 375 miles at 105 m.p.h. Government subsidies will enable it to be sold in France for the price of the very austere 4 h.p. Renault car.

* * *

THE TAYLOR TROPHY for proving that what looks wrong is right still goes to the Hurel Dubois *H.D.*32, with its 149 ft. span, ultra-high aspect ratio wings. Its fighter-like take-off and near vertical banks 100 ft. above the deck looked horrifying but were perfectly safe; and Air France will probably have 24 as *Dakota* replacements.



Left: The Hurel-Dubois H.D. 32's tail unit has been continually modded.; photo shows the latest and perhaps final version. Below: In France you can buy this neat little Sipa "Coccinelle" for the price of a 4 h.p. Renault car.

Two auxiliary fins have now been added to the massive central fin and rudder. Another interesting feature is that the skins over the rear half of each fairing between engine and main undercarriage are hinged vertically, and open sideways to form T-shape air-brakes.

The *H.D.*32 has two 1,200 h.p. Pratt and Whitney R1830-92 engines and will carry 44 passengers or 12,200 lb. cargo for up to 1,650 miles at 168 m.p.h. Substitution of two 1,525 h.p. Wright *Cyclones* in the *H.D.*321 raises the freight load to 16,300 lb. over a 620 mile range, or 14,000 lb. for 1,240 miles. Other variants are the *H.D.*34 which will be used for air survey photography by the French National Geographic Institute, and the *H.D.*35 anti-submarine aircraft with retractable "dustbin" radome under its front fuselage, a radar nacelle on its starboard wing leading edge, and an MAD (magnetic airborne detection) stinger tail like the Lockheed Neptune. Endurance with a warload of homing torpedoes will be 20 hours at 100 m.p.h.

* * *

SURPRISE EXHIBIT was a photo of the previously unknown Czech *L.*60 agricultural aircraft. Powered by a 200 h.p. *Doris B* engine, it appears to be a cleaned-up Fieseler *Storch*, with the same much-slotted and flapped wings, spanning 45 ft. 9 in., but with a new tail end. Per-

formance figures at a gross weight of 3,020 lb. are: Max. speed 118 m.p.h.; Cruising speed 112 m.p.h.; Crop-spraying speed 34 m.p.h. Ceiling 17,400 ft.; Take-off (to clear 50 ft.) 750 ft.; Landing run 590 ft.; Range 435 miles.

Production deliveries are due to start in January-February 1956.

* * *

A commercial version of the 4 h.p. Renault took part in the flying display, dangling precariously on the end of a sling under the S.E.3130 *Alouette II* helicopter. Idea was to show the flying crane capabilities of this jet-powered 'copter, which set up a new height record of 26,936 ft. on June 6th. Powered by a 400 h.p. Turboméca *Artouste* turbine, it is a five-seater and can carry a totally enclosed stretcher housing on each side of its cabin for casualty evacuation. About 75 have been ordered for liaison, spotting and ambulance duties with the French Services.

* * *

RIVAL FOR THE HELICOPTER will be Bréguet's *Model* 941 high lift transport, shown in model form at Le Bourget. Reviving the old Crouch-Bolas scheme of "slipstream lift," its four 450 h.p. Turboméca *Turmo* free turbines will drive propellers of such large diameter that they will provide slipstream over the entire wings. By directing this airflow over multiple-slotted flaps, shown on the model in their maximum lift position, it is claimed that the *Bréguet* 941 will take off vertically in a reasonable wind, and in 60 yards under full-load still-air conditions.

Intended as a military freighter, it will be a 26,500 ln. aircraft, with ramp-loading into a typical freighter boxcar cabin, and skid undercarriage. To prove the basic design, Bréguet are building the smaller *Model* 940 If it works, its combination of near-vertical take-off and reasonable forward speed may kill the medium-sized helicopter for many military support duties.

* * *

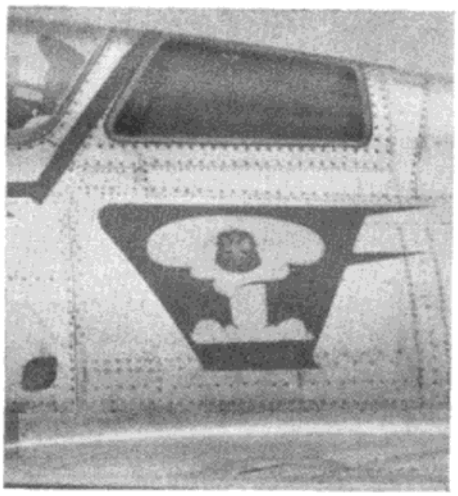
SKID UNDERCARRIAGES, to meet NATO requirements for operation from small, rough fields were demonstrated on S.E. *Mistral* (Vampire) and S.E.5000 *Baroudeur* fighters, both of which took off and landed on their skids. *Mistral's* take-off run was said to be 440 yards. Landings were noticeably bumpy and unkind to the two fin strakes under the Baroudeur's tail.

* * *

ODDS AND MODS: *Noratlas* twin-boomed transport was demonstrated with two wingtip-mounted Turboméca *Marboré* baby turbojets supplementing its two 2 070 h.p. *Hercules*. Added power permits full load take-off and normal climb in hot climates or from high altitude airfields.

S.O.9000 *Trident* mixed jet and rocket interceptor now has two wingtip-mounted Armstrong Siddeley *Viper* turbojets giving twice the power of the *Marborés* previously fitted. With the 9,900 lb. thrust three-barrelled SEPR rocket motor, they give it a level speed of Mach 1.6 (1,050 m.p.h.), and it has already exceeded Mach 1 in a climb. Using its turbojets for cruising, endurance is one hour. Designed ceiling is 72,000 ft. and all-up weight 12,100 lb.

Commentator gave the speed of both the *Victor* and *Vulcan* as Mach 0.9 at 50,000 ft.; said the *Victor* carries a crew of five; and that the *Vulcan* may be built in Australia.



Top: Czech L.60 bears an obvious likeness to the Fieseler "Storch." Right: Squadron insignia on F-84 Thunderstreak of the U.S.A.F. showed a yellow dragon in a white atomic "mushroom" on a pale blue background.

Top: A colourful F-86 of the U.S.A.F.'s "Skyblazers" aerobatic team. Below: This Alouette II helicopter has set up a new height record.

REFLECTIONS—

on the International R/C Meeting

Held at the Mulheim-Essen Aerodrome, Germany

1. The Stegmaier brothers fit a parachute into the dropping compartment. 2. Dr. Gobeaux of Belgium releases the machine which his son piloted.

by George Honnest-Redlich

INTERNATIONAL meetings are a great contribution to technical progress in any sphere. At home, meeting the same competitors and seeing the same equipment tends to leave one in a groove of complacency. I was, therefore, very pleased to see, especially among the Belgians, a very successful approach to R/C flying using different, and sometimes simple, equipment of a type with which we have not had much success, such as the mark/space, or pulsing systems which give progressive or proportional control. These are well known to the boating fraternity, but have not been altogether successfully employed in model planes. But it is seldom that the system is at fault, it is the mechanical gadgets and lack of practice which usually let us down.

Now let me put in a point about our failure in equalling our foreign friends' excellent performances. In short, it is lack of practice. They know their models, they know their capabilities, they know when and how to do their manoeuvres, and, perhaps most important, they know the rules governing international competitions. We cannot put all the blame on our weather; for instance, my friends and I have to make a 170 mile return journey to find a usable flying field which has a suitable surface on which to practice r.o.g. and engine on landings, and is sufficiently free from the week-end crowds, which create such a hazard on landing. I feel that it is up to our organisations to make and give facilities to would-be international finalists, and not just a few weeks, before the event, but well in advance.

I will now describe a few of the competitors who merit distinction because of their individual approach to the technical side of radio-controlled model planes.

First—and in this case the winner—the Equipe Dr. Gobeaux or Gobeaux's circus. For years he has remained true to the E.D. *Radio Queen*, and has modified and strengthened it to carry his powerful engines and large multi-valve receivers. The French Micron 10 c.c. glowplug engine he uses gives his model the power to climb quickly and to penetrate the wind. His radio equipment, which is made by one of his team, J. Dubuisson, was the first to appear publicly using tuned circuit channel selection instead of the usual tuned reeds. It has a three valve detector and amplifier followed by one valve for each of the three channels used—six valves in all. The valves are: 3V4, 1T4, 3V4 receiver and one 3V4 for each channel, and a L.T. consumption of over half an ampere! Quite definitely unsuitable for lightweight under-powered models.

RESULTS

	Mks.
Multi-Channel, Power	
1. Gobeaux (Belgium)	459½
Single-Channel, Power	
1. Laiy (Belgium)	205½
Glider	
1. Bichel (Switzerland)	143½

Now, surprisingly enough, an E.D. Mk. 3 escapement is used for rudder operation, and an electric motorised actuator, controlled by two channels, operates the elevator. To win with a set-up such as this means faultless control which is born only of long practice.

Karl Heinz Stegmaier of Germany has made no radical changes to his standard model with vacuum operated controls since last year. He now uses a portable transmitter, powered by an accumulator which is carried separately and thus rather reduces the portability. The transmitter has a well designed telescopic aerial which retracts completely into the case.

The receiver has eight tuned reeds of which only six are utilised. The circuit is the same as that employed in the 6-reed E.D. outfit, which I designed. The flying controls on

the model are worked by minute electro-magnetic air valves which operate double cup and membrane actuators, giving a pull of over 2 lb.

The engine he used last year, a pre-war 6 c.c. Eisfeld, was this year replaced by a specially designed Swiss 7 c.c. diesel with a built-in vacuum pump, with which slight teething troubles have been experienced. Personally, I prefer to use a long stroke diesel of large capacity capable of swinging a big prop. for R/C models.

The next individualist is M. de Hertog of Overysse, Belgium. The Belgian G.P.O. have given two neighbouring frequencies for R/C, the international 27 M/cs. band and a 32 M/cs. band. De Hertog has adopted the obvious method of having two transmitters and two receivers, one on each frequency. His model is large, having a wing span of over 7 ft., and weighing 10 lb., and is powered by an Olsen "60" spark ignition engine.

De Hertog's radio equipment, which is entirely home made, consists of a double transmitter, accumulator operated and crystal-controlled, with three 6V6 valves. As the frequencies are close together they can be radiated by one aerial.

The two receivers are standard practice XFG1 types. Both actuators are mark/space ratio operated, the rudder by a solenoid at a fairly low pulse frequency, judging by the very visible rudder flap (shades of Howard Boys!), while the elevator actuator is driven by an electric motor. Both controls are semi-proportional. The engine speed control is operated by varying the pulse rate of one of the other controls. This method is usually a little tricky, and I noticed that in fact it was seldom used.

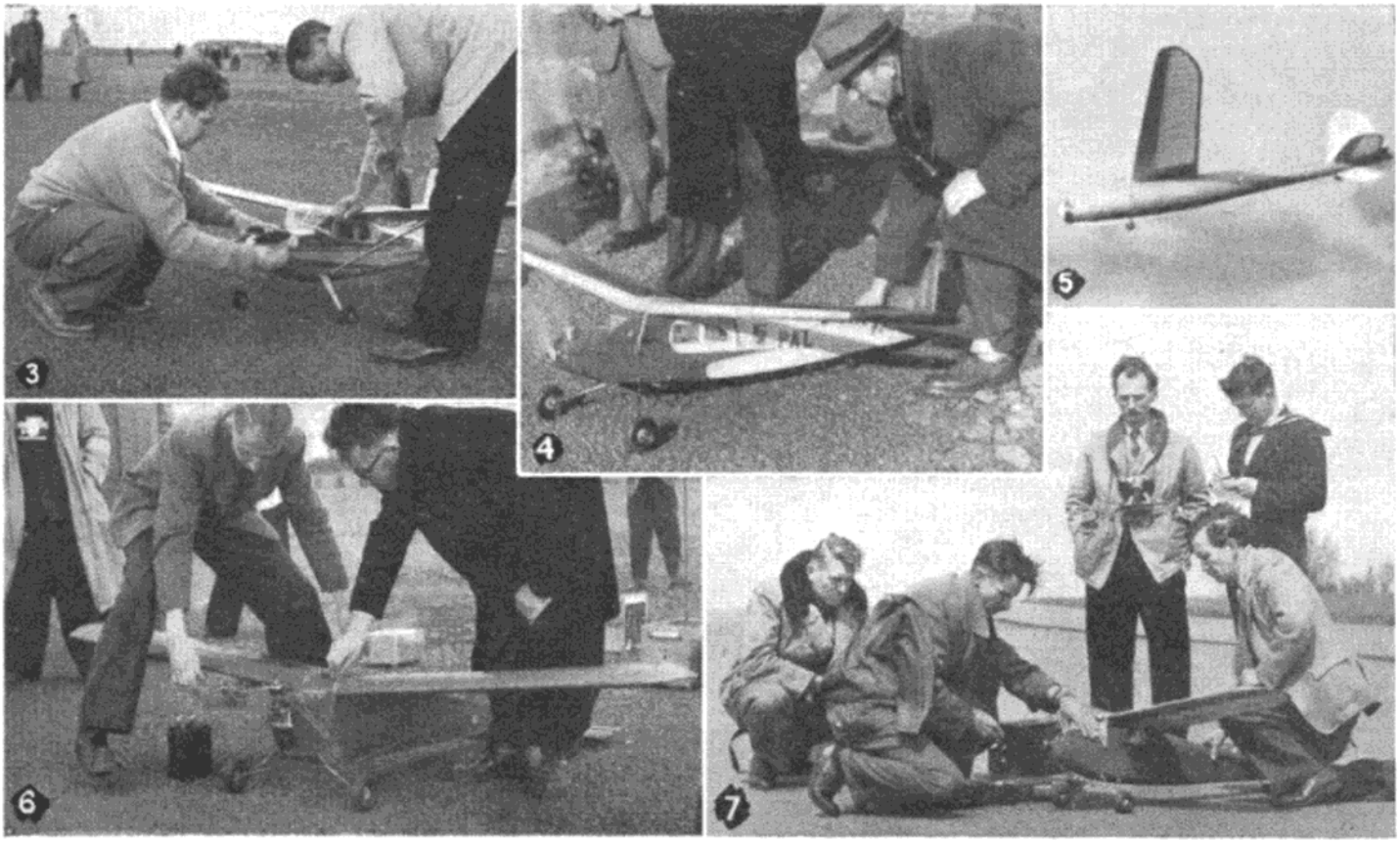
H. Lichius of Wann, Germany, had one of the finest models I have seen—a fully detailed scale *Cessna*. It was only finished a short time before the competition, and was one of the few models which the owners were not practised in flying. His six channel transmitter is home made and the circuit employed is G.H-R/E.D. modified to use German surplus valves. His receiver is a standard E.D. Mk. 4 three channel unit converted to six channels. The rudder on the model *Cessna* is operated by a solenoid, the elevator by an electric motorised actuator, and the engine by a G.H-R twin butterfly.

O. E. Hemsley (G.B.) and A. Wastable (France) used six reed equipment. Wastable, who deserves praise for the fact that all his equipment is home made—even reed unit and relays—had his usual competition bad luck. I have seen him fly in his home town with an ease and verve which would beat all-comers.

I have only mentioned the models with multiple controls so far. In single channel flying we could have easily held our own with our usual type of equipment and our usual flying. One competitor using single channel equipment who is worth mentioning from a technical point of view is W. Vandermeulen of Overysse, Belgium. He flew a *Rudderbug* powered by a McCoy 29 glowplug motor. His radio equipment consists of a self-made three valve crystal controlled transmitter and a hard valve receiver. The rudder control is semi-proportional using a mark/space ratio system.

Summing up we must remember one thing. These international contests call for some nineteen manoeuvres, not just the usual seven our contests are won on, and it was very obvious that lengthy and painstaking practice won the day.

3. Lichius of Germany starts up his Cessna scale model. 4. Laiy, Belgium, starts his single channel machine. 5. Dr. Gobeaux's glider coming in to land. 6. De Hertogh of Holland about to take off. 7. Ted Hemsley and George Honnest-Redlich, both members of the British team, pictured here at Debden during the eliminators.



OVER THE COUNTER

Ample stocks of white Japanese tissue are held by H. J. Nicholls Ltd., retail price being 3d. per sheet. Available only in white, and a recent import.

The same firm have also just introduced a spinner of spun aluminium with an aluminium backplate and moulded plastic spinner nut. A threaded steel insert is moulded in with the plastic member, which screws directly on to the motor shaft to lock the spinner in place. Currently available in 1¾ in. dia. with a ¼ B.S.F. thread, and 1½-in. dia. with a 2-B.A. thread. Price 2s. 7½d. each size. Other sizes to be added.

* * *

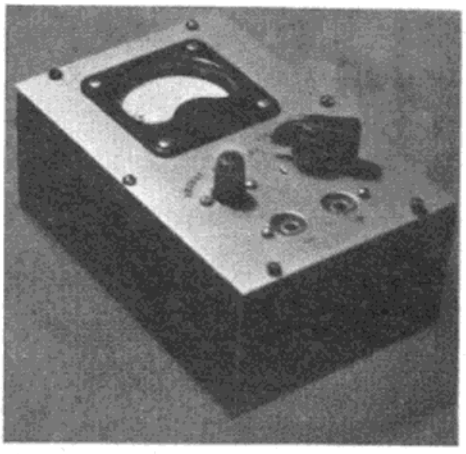
Three delta chuck gliders, packed in an envelope, all parts pre-cut and pre-decorated—price, 6d. Latest Keilkraft production, these simple models are aimed at the "toy" market, but can be a lot of fun for even experienced modellers. No cement is used in assembly. The basic parts slot together and are locked by means of a cruciform-slotted dowel "nosepiece."

* * *

The Keilkraft Junior "60"—a type recognised as a "standard" for radio control work, has just re-emerged as a specialised radio control design. Retaining the same aerodynamic layout and constructional features, the fuselage has been widened to give more interior room and suggested radio control installation details are shown. The new Junior 60 kit costs 52s. 6d.

* * *

The poor man's Avo meter—at 52s. 6d. (ex Ripmax)—this handy volt-amp-ohm meter is a worthwhile addition to the radio control fan's equipment (see photo). The meter can be switched to measure 0-6 volts, 0-150 volts, 0-3-milliamps, or measure 0 to 10,000 ohms resistance values direct. Used as an ohm-meter, e.g. either to measure actual resistance values or for continuity checks, power is drawn from a single dry cell housed in the case. Always remember to switch to the correct scale *before* connecting up. Range covers requirements of all radio batteries for voltage checks and both receiver and transmitter operating currents.



* * *

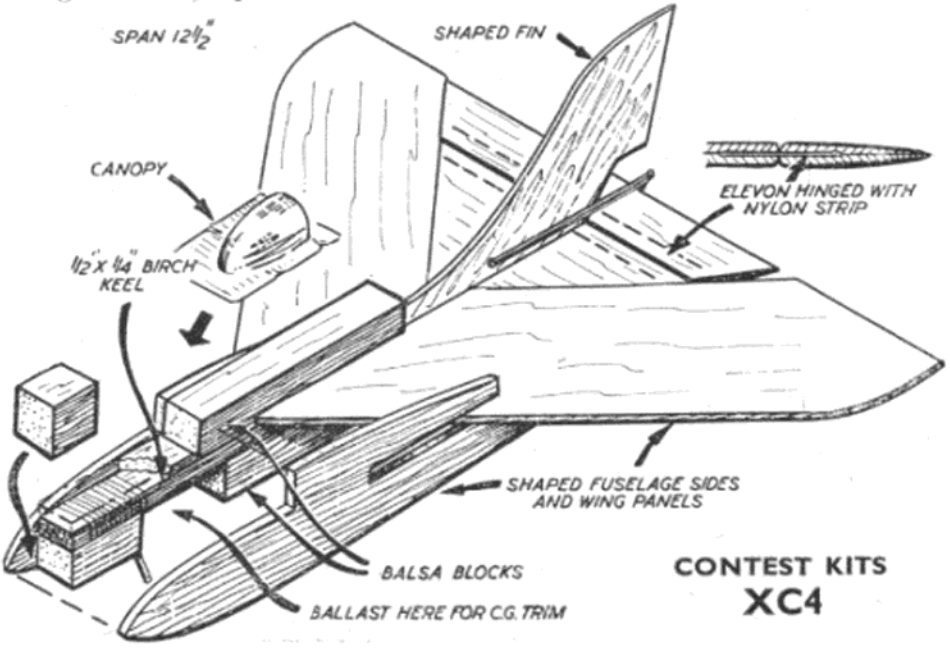
A full range of Cellon dopes is available once again on the model market. In addition to the usual colours, clear and glider dopes are included. The latter has strong tautening powers (e.g. specially suited to silk or nylon covering) but is formulated without plasticiser and resin. It is not as waterproof as the ordinary clear dope.

* * *

Although not enamoured with the *type* (we regard catapult-launched, high speed models as far too dangerous for the average flying field), the XC4 makes up into an attractive enough model, with very modern lines. An ingenious elevon trimmer, automatically operated by band tension, ensures a good glide performance following a catapult launch to height, and we fully believe that the model could reach the 200 ft. altitude claimed, with a really powerful catapult.

Most of the kit parts are cut to shape, leaving only the fuselage filler blocks to be trimmed and the fuselage rounded after assembly. Contents of the kit, in fact, show the touch of an aeromodeller who knows just what model builders want.

Although a separate printed instruction leaflet is supplied, we feel that the plan really requires perspective sketches to help the less experienced youngster who might be tempted to tackle this model. Otherwise it is a nice, practical kit. Designed and produced by Contest Kits, it costs 6s. 11d.

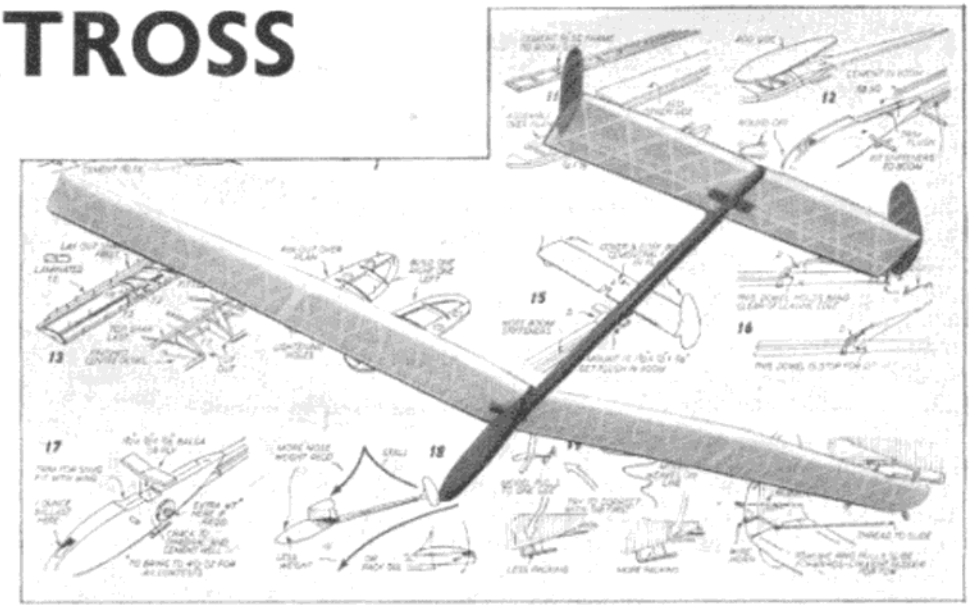


The ALBATROSS

★

THIS MONTH OUR OVER THE COUNTER KIT REVIEW SERIES FEATURES A NEW GLIDER TO THE A1 SPECIFICATION BY SKYLEADA

★

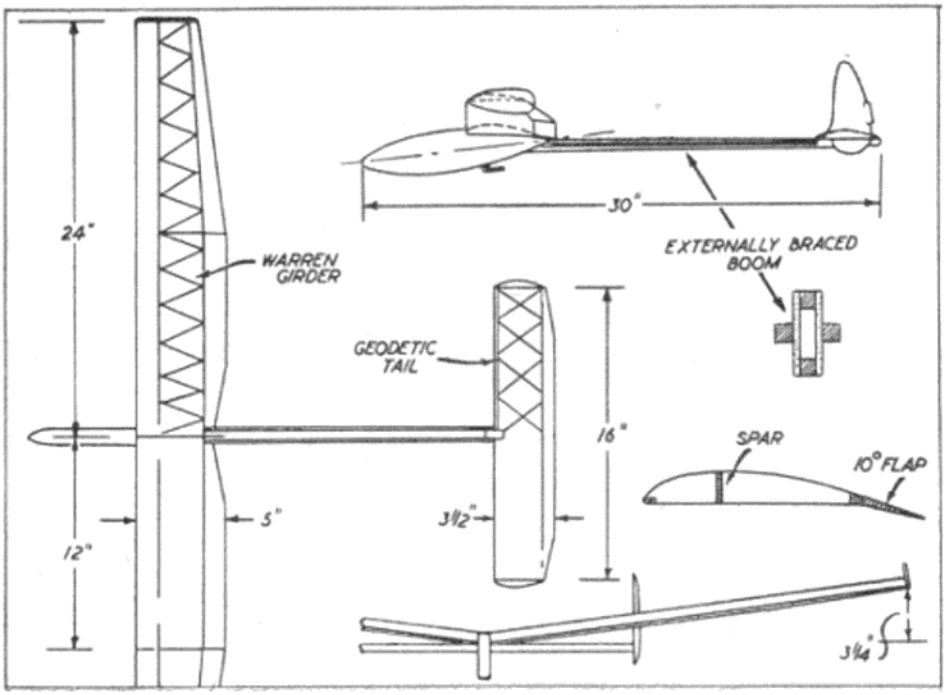


IT is the exception rather than the rule to find kit models employing contest-type construction and this new commercial design can certainly be rated as one of the exceptions—on this and several other scores. The *Albatross* has been produced around the A1 glider specification, with its evident appeal for "junior" contests, and as a high-performance type is comparable with contemporary Continental designs to this particular formula.

The design is of conventional pod-and-boom layout, with the boom specially strengthened by external stiffeners. These serve the dual purpose of preventing "whip," which could cause the tail to flex in flight (a common fault of pod-and-boom models of this size) and also considerably strengthening the fuselage against damage in crash landings.

The wing design is completely new. It consists, virtually, of three sections—a nose section formed by close-spaced riblets back to a full depth mainspar; a rear section with anti-warp warren-girder construction; and drooping trailing edge flaps which are added after covering. The tailplane is fully geodetic with top and bottom mainspars to prevent "bowing." The tailplane has endplate fins of cambered section, the fins also being of high aspect ratio. A trim tab, which can be coupled up as an auto-rudder, is fitted to the port fin only.

At first sight this appears a complicated model to build. In point of fact it is not. It certainly takes longer to build the wing and tailplane than with orthodox structures, but the process is extremely straightforward and there is very little chance of going wrong. All the main features of assembly and finishing are covered by a series of 20 step-by-step illustrations included on a separate sheet, these being about the most comprehensive we have yet seen in a British kit.



The kit includes pre-shaped pod and boom parts and fuselage assembly is straightforward. The nose compartment is large enough to accommodate approximately 1 oz. of lead ballast, which should be just enough to balance the model out at the design c.g. position. Finished and doped, the model in this trim should weigh a fraction under 4 oz. An extra 1 oz. must be added to bring up to 5 oz. to conform to the A1 specification. This is suggested as lead discs bolted to each side of the fuselage under the wing position.

Performance on tow of our test model was exceptionally good and any tendency to turn off is readily trimmed out with the tab. Quite a fair amount of rudder offset is needed to produce a tight glide circle and so an auto-rudder is desirable for this sort of trim. Glide performance we thought even better ballasted to 5 oz. than at the lighter weight, particularly in turbulent air. Without the ballast, the *Albatross* is undoubtedly a real "floater."

The plans make a point that the tail structure should be made as light as possible, which we endorse. The two spars necessary to give a good anti-warp structure are on the large size and any weight saved here by sanding down their width—and sanding down ribs to 1/32 in. and choosing the lightest of the kit wood for all spars—will pay dividends in increased performance. And to improve the appearance, although the wing flaps are attached after covering and doping the wing, we suggest covering these also with coloured tissue to match any colour used on the wings.

Summarising: a most interesting design, both constructionally and in aerodynamic layout, and one which shows every signs of having a true contest performance. Anti-warp surfaces and an exceptionally strong wing are the rewards for a somewhat increased building time over a conventional structure. And all the "different" features are of the practical type.

CHALETMA

BUILD THIS ROBUST RUBBER JOB FOR PLENTY OF TROUBLE-FREE FLYING

by J. Fuller

CHALETMA was designed and built purely for sport flying, and built with that object in mind it will provide plenty of trouble-free flying hours. The model is as tough as they come, and will withstand most hazards common to the "bad luck" brigade. The original has flown into brick walls, trees, telegraph wires and poles, and has even been rescued from a watery grave a quarter of a mile out to sea—and flown away with only minor repairs to tissue, etc. The original was designed and built in a holiday camp chalet—hence the name.

Fuselage

Cut out all pieces F1 to F6, the undercarriage supports ($\frac{1}{2} \times \frac{1}{8}$ in.) and pieces $\frac{1}{4} \times \frac{1}{8}$ in. Leave the cabin and decking until later.

Build the two sides of the fuselage over the plan, one on top of the other, in the usual manner. Pre-cement at F3, F4, F5 and the $\frac{1}{2} \times \frac{1}{8}$ in. and $\frac{1}{4} \times \frac{1}{8}$ in. pieces. Put in the $\frac{1}{8} \times \frac{1}{16}$ in. upright spacers first, then fill in the cross members. Add the cabin sides to fuselage sides, still flat on plan. Make F1 and F2—again it is advisable to pre-cement here. When dry, separate fuselage sides. Cement F1 and F2 in position. Draw ends of fuselage together to F6, top and bottom, and the sides at the nose; also F7 top at rear. Draw extreme end together to F8 top and bottom.

Add all $\frac{1}{8} \times \frac{1}{16}$ in. spacers, then add all cross members except where the undercarriage comes out at bottom of fuselage. Note.—The spacers and cross members go between the main longerons. The cabin sides are still standing on their own, so be careful at this stage not to damage them.

Next cut pieces X1, X2 and decking formers. Sandwich two thicknesses of scrap $\frac{1}{8}$ in. sheet between X1 and X2 and sand to smooth faired shape; this faired block is positioned behind cabin. Cement decking formers upright over existing spacers on top of fuselage, and add 3/32 in. sq. stringers, which should be chamfered to sit cleanly on F7 and be firmly cemented down.

Now add two $\frac{1}{8}$ in. sq. spacers between cabin sides in position over existing spacers, just below level of wing. A rule laid between the V's of F1 and F2 will give you this line.

Bend up U/C from 14 S.W.G. wire. Cement tape to outside of pieces $\frac{1}{2} \times \frac{1}{8}$ in. and sew and cement U/C in position. Fillet the corner where leg comes out of fuselage, and add missing $\frac{1}{8} \times \frac{1}{16}$ in. cross member. Make nose-block, prop. assembly and 1 mm. ply nose former. Note that the down thrust is built in, so lay the nose block flat and drill square. Add wing and tail dowels, and pieces of 1 mm. ply behind F4. Fit the wheels and wind screen, also windows if desired. Drill hole for motor peg; a 4-B.A. nut and bolt was used for this.

Wings

These are built in two halves and joined together at correct dihedral angle.

Cut all the ribs. Lay $\frac{1}{4} \times \frac{1}{8}$ in. main spare and $\frac{1}{8}$ in. sq. sub-spar over plan of L.H. wing, and seat ribs on them. Add L.E. and T.E. and tips, also add top sub-spar. Note that root rib W1 must be tilted to dihedral angle as per template. Cement rib W1 of R.H. wing to W1 of L.H. wing and add dihedral brace.

Build R.H. wing in same way as the L.H. wing, but without W1. When dry, join to R.H. wing at W1, raising one wing 8 in. at tip, while the other lies flat. Sand 1/32 in. off top profile of W1 and W2, including spar, and then cement in the gussets. Sheet over between W2 and W1 with 1/32 in. sheet, and sand off L.E. to shape and clean up framework.

Tailplane

Build flat on the plan, making sure that the centre ribs are upright, as these determine the fin position. Sheet over centre section, removing sheet between centre ribs for fin. Build fin and sand to shape. Cut sub-fins and cement to ribs. Do not cement fin to tailplane until covered and doped.

Covering

Lightweight Modelspan is used to cover the fuselage, leaving decking to last. Cover this with one strip to give streamlined shape. The tailplane will have to be covered in several pieces owing to the sub-fins. Give one coat of dope all over and this should be sufficient to give a tight finish if covered well and water shrunk. If not, apply a second coat.

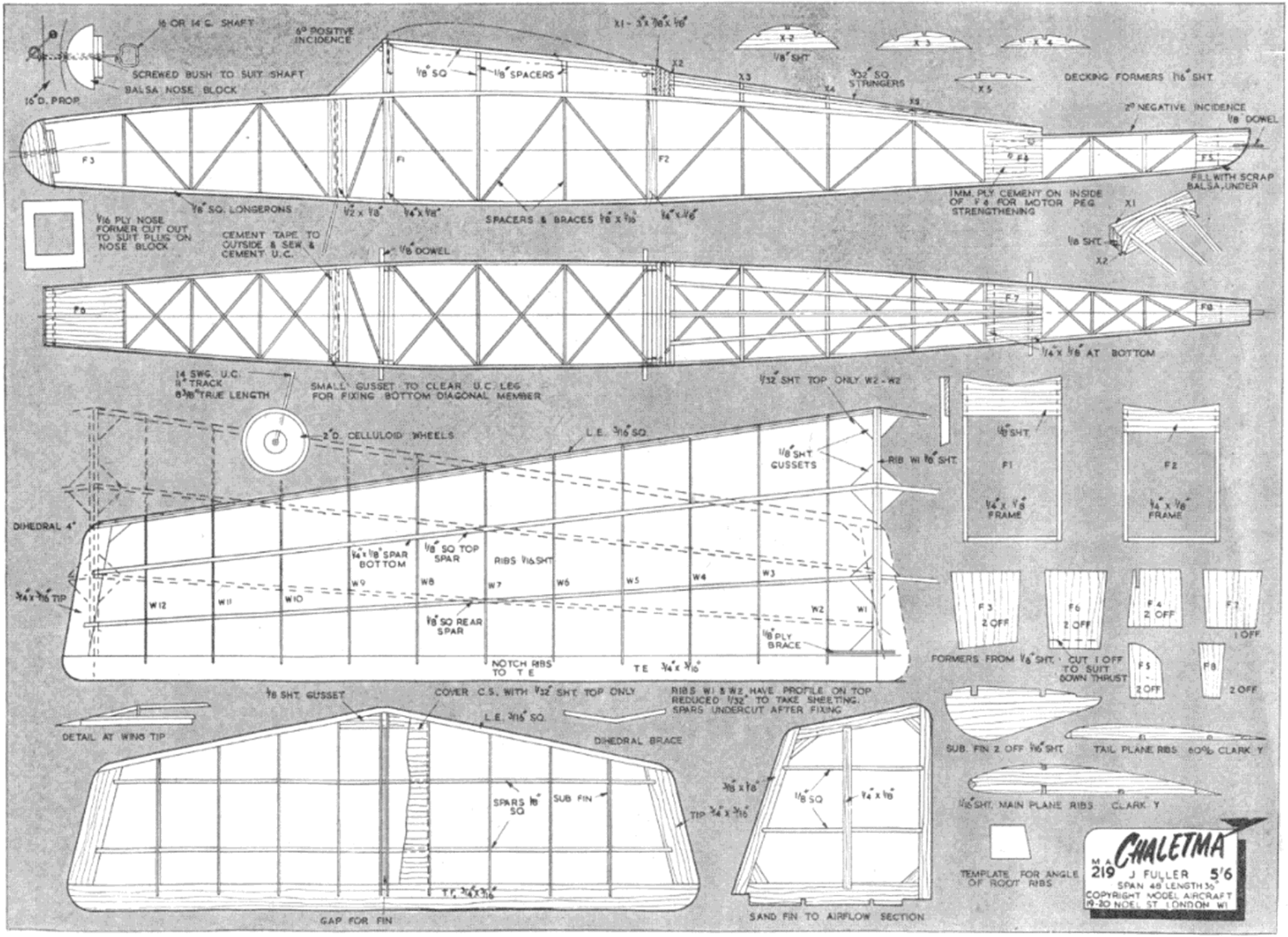
Loop and pre-tension the motor, lubricating well. The motor fixing can be varied to choice; the original had a hand made bobbin from tube and mm. ply. See that the prop. is free-wheeling easily, and give the propshaft a spot of oil.

Flying

If it is windy, pack L.E. of tail to prevent stalling. Obtain good flat glide, and then offset tail and fin by not more than $\frac{1}{16}$ in. to give a right hand turn. It is dangerous to offset more than this at this stage—the large fin area having a marked effect.

Build up the power run gradually, checking the reaction each time until model is safely trimmed; $\frac{1}{16}$ in. right side thrust will be needed after 75 turns.

The model will climb steeply and should roll off at point of stall. After that you can do almost anything, and the original was found extremely stable under all conditions; 300 turns were found to be ample for sport flying—either for r.o.g. or hand launch.



FULL SIZE WORKING DRAWINGS ARE OBTAINABLE FROM YOUR LOCAL DEALER, OR BY POST FROM THE "MODEL AIRCRAFT" PLANS DEPARTMENT 19-20, NOEL STREET, LONDON, W.1, 5s. 6d., POST FREE

The NATS

THE 1955 BRITISH NATIONALS
held at Waterbeach aerodrome, Cambridge

RESU

LADY SHELLEY CUP

1. F. C. Smith	...	Southern Cross	... 7 : 42
2. J. Marshall	...	Hayes	... 7 : 37
3. I. Crawshaw	...	St. Albans	... 3 : 56
4. G. Gates	...	Southern Cross	... 3 : 47
5. J. Headley	...	English Electric	... 3 : 26
6. K. Donald	...	Southern Cross	... 2 : 58

BOWDEN TROPHY

				pts.
1. R. Swinden	...	Darlington	...	1675
2. J. West	...	Southern Cross	...	1530
3. L. Ellis	...	R.A.F.	...	975
4. G. Jackson	...	C.M.	...	950
5. I. Durrant	...	Epsom	...	940
6. M. Pressnell	...	Belfairs	...	900

THURSTON CUP

1. D. Painter	...	Henley	... 12 : 00
2. D. Latter	...	Men of Kent	... 10 : 44
3. M. Aspinal	...	Rugby	... 10 : 19
J. Waldron	...	Henley	... 10 : 19
5. I. Crawshaw	...	St. Albans	... 9 : 37
6. M. Starker	...	Seekers	... 9 : 07

SHORT CUP

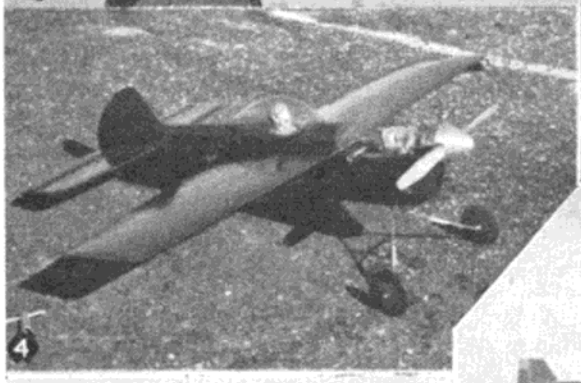
1. R. Monks	...	Birmingham	... 7 : 17
2. I. Lucas	...	Brighton	... 5½ : 00
3. L. Hayward	...	Chingford	... 4 : 43
4. G. L. Roberts		Lincoln	... 4 : 28
5. R. Ward	...	Croydon	... 3 : 58
6. A. Longstaffe	...	de H. (Hatfield)	... 3 : 19

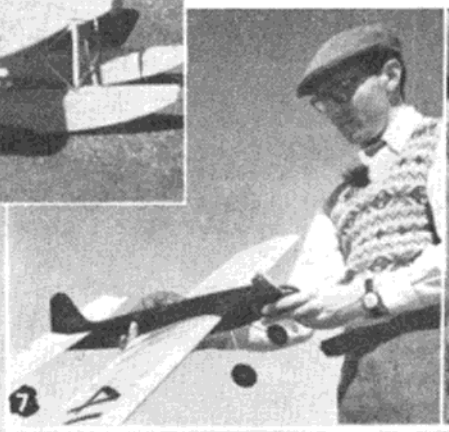
MODEL AIRCRAFT TROPHY

1. R. North	...	Croydon	12 : 00	+ 9 : 12
2. E. Bennett		Croydon	12 : 00	+ 8 : 52
3. G. Upson	...	Northwick Park	12 : 00	+ 5 : 49
4. R. Monks	...	Birmingham	12 : 00	+ 4 : 35
5. D. Wood	...	Luton	12 : 00	+ 1 : 40
6. J. O'Donnell	...	Whitefield	11 : 55	

TAPLIN TROPHY

1. H. Boys	...	Northants	... 279
2. C. Dance	...	North Kent Nomads	238½
3. R. Higham	...	C.M.	... 237
4. J. Fox	...	Hatfield	... 213
5. P. Chapman	...	Luton	... 204
6. E. Palmer	...	West Bromwich	... 163½





LTS

SIR JOHN SHELLEY CUP

1. K. Rowsell ...	Laindon ...	...	12 : 00
2. D. Posner ...	N.W. Middx.	...	11 : 52
3. I. Harrison ...	Cheadle ...	...	11 : 14
4. D. Stenning ...	Reading ...	...	10 : 55
5. K. Donald ...	Southern Cross	...	9 : 56
6. R. Abbey ...	Coventry ...	...	9 : 45

SUPER SCALE TROPHY

		pts.
1. A. W. Evans ...	Bromley	79
2. P. Ball ...	Leicester	78
3. P. Russell ...	C.M.	73
4. P. Whittaker	Associate	70

S.M.A.E. TROPHY

		pts.
1. A. McDonald ...	W. Essex	306
2. E. Hemsley ...	Bushy Park	275
3. H. Boys ...	Northampton ...	201
D. Benson ...	Hatfield	201
5. J. Fox	Hatfield	199½
6. S. Sutherland	W. Essex	193½

GOLD TROPHY

		pts.
1. P. Russell ...	Associate	312
2. E. Lloyd ...	R.A.F	281
3. A. Piacentini ...	Salisbury	280
4. P. Ridgway ...	Macclesfield	268
5. W. Morley ...	W. Essex	264
6. P. Jubb ...	Crosby	184

DAVIES TROPHIES

Class "A"

1. R. Edmunds ...	High Wycombe ...	9 : 58
2. P. Smith ...	Chingford	10 : 12
3. A. Jackson ...	Foresters	11 : 15

Class "B"

1. J. McNess ...	West Essex	7 : 09
2. J. McGown ...	West Essex	7 : 24
3. K. Muscutt ...	West Essex	7 : 30

SPEED CLASS 1

		m.p.h.
P. Wright ...	St. Albans	95.16

SPEED CLASS 2

D. Powell ...	East London ...	127.1

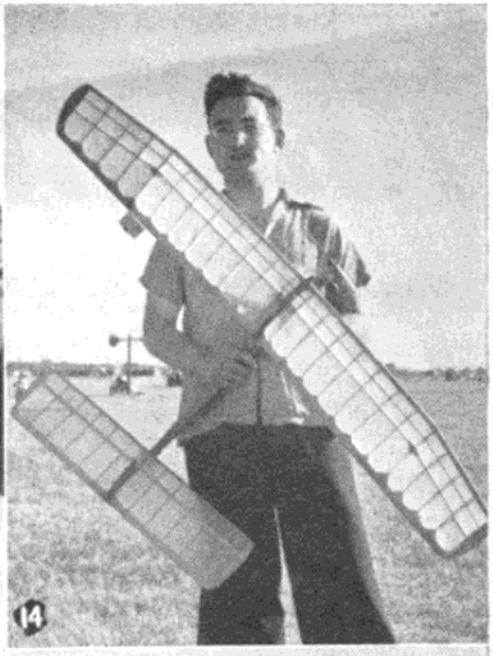
SPEED CLASS 3

R. Davenport ...	E. London	146.2

JET

P. Russell ...	Associate	131.6


13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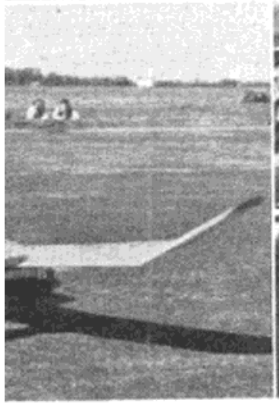
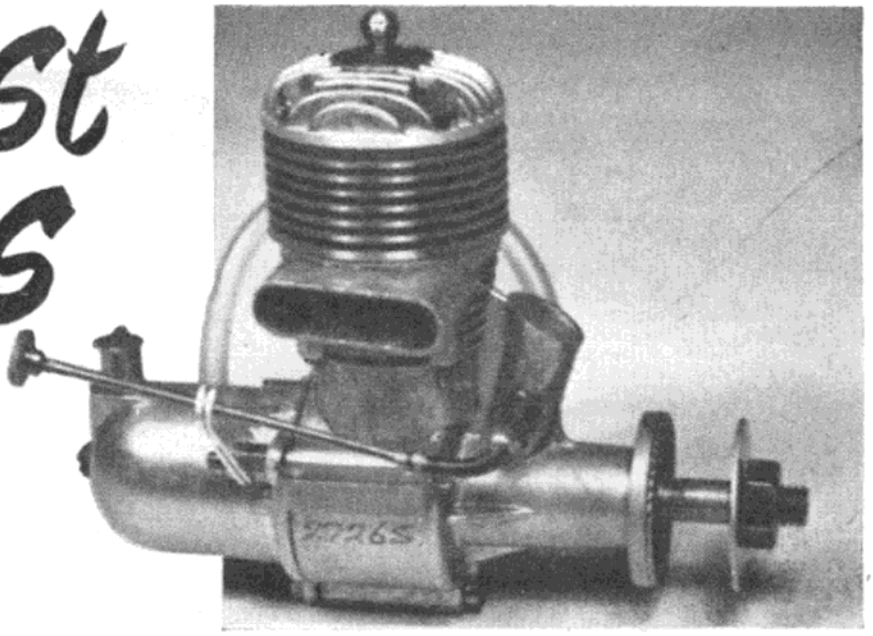



12

1. In perfect weather power competitors await their turn to fly in the Sir John Shelley.
2. D. Painter of Henley seen flying his Oliver powered model in the Thurston Cup, placed first in the glider event on the preceding day.
3. Flying a scale model of the Brandenburg Seaplane in the Super Scale Trophy event, A. W. Evans of Bromley placed first.
4. Cooling down after completing 10 miles in 7 : 09 is J. McNess' class "B" T/R.
5. Receiving his prize money from Mrs. Chatsfield, is A. McDonald (West Essex) who took first place in the S.M.A.E. Trophy radio.
6. C. Dance (North Kent Nomads) had only test flown his new model once prior to entering the Taplin Trophy and taking second place.
7. Past Gold Cup winner, A. Piacentini of Salisbury placed third this year.
8. Seen here starting his model in the class "A" T/R finals is R. Edmonds (Wycombe) who won the event. Next day he ran the "B" T/R.
9. Fitting the nose block to his rubber model is G. Upson of Northwick Park who was placed third in the "M.A." Trophy.
10. Well-known Birmingham flier, R. Monks, launches his model in the PAA-Load event which he won.
11. A tubular balsa fuselage was the outstanding feature of this beautifully built model flown in the "M.A." Trophy by R. Chesterton.
12. For achieving 95 m.p.h. in the class one speed, P. Wright (St. Albans) collects first prize from the Station Commander's wife.
13. From Cheadle came I. Harrison to fly his model into third place in the Sir John Shelley.
14. Winner of the power event, K. Rowsell of Laindon poses with his model.
15. L. Sayer, competing in the "M.A." Trophy, piles on the turns assisted by a member of the fair sex.
16. Seen with his model, H. Boys placed in both radio events (1st Taplin, 3rd S.M.A.E.).

The Latest Engines



More Frog 500's have been sold than any other large British engine. This is the revised 1955 model, externally unchanged but having internal improvements.

DURING the past month or so we have handled about a dozen new engines of various nationalities. Most of the them have been of overseas manufacture. Among British products, however, we received three of the revised 1955 Frog range. These were the glowplug-ignition "500," the Mk. II "50" diesel and the Mk. II "150" diesel with water-jacket.

Old readers will recall that the Frog "500" was introduced late in 1949. Apart from an early change-over from cast-iron to bronze main bearings, the "500" has remained practically unaltered since this date. In 1951 a spark-ignition version of the "500" became available and was featured in the MODEL AIRCRAFT Engine Tests series in the January, 1952 issue. The standard glowplug "500" was tested in the May, 1950, issue.

Opinions of Frog "500's" are varied, but mostly favourable. The average modeller finds the "500" entirely staisfactory; it starts well, has plenty of power, and it is well built and does not break or wear out easily. It is exceptionally good value for money. Of course, the self-styled club expert may be heard to dismiss "500's" with a sniff, but the trouble with this sophisticated gentleman is that "500's" are not "exclusive" enough for him; they are cheap enough for anyone to buy, and to own one does not carry with it any particular distinction, whereas being the possessor of a Dooling or Oliver Tiger does—even if you don't know how to use it. . . .

The Taifun Hobby of 0.99 c.c. A well-made unit with pleasant handling characteristics, this model supersedes the Taifun Junior of the same capacity.

ACCENT ON POWER
by
P. G. F. CHINN

One criticism we have heard levelled against "500's" is their tendency to run rich and "four-stroke" in C/L flight, particularly when used for stunt or combat work and when engines are side mounted. This is not strictly a fault of the engine at all, but one which concerns installation and tank location. The "500" is an unusually flexible engine and will "four-stroke" evenly quite readily on a slightly rich mixture. This is a useful feature for R/C two-speed control but to obtain even two-stroking from take-off and throughout a C/L stunt pattern, it is necessary to position the fuel tank (relative to the carburettor jet) rather carefully.

Some years ago, the writer conducted some experiments on this, the results of which were later reported, in part, in MODEL AIRCRAFT. In one of these tests, a Frog "500" was side-mounted, according to plan, in a popular kit stunt model. It was observed that the centreline of the jet was then approximately 1¼ in. to the outside of the centreline of the tank. It was calculated that, flying on 55 ft. lines at around 60 m.p.h., the fuel would be pressurised at the jet at about 4½ g. and, with a full tank, this would be the equivalent of a gravity feed on the bench of not less than 6½-7 in. Thus, with the engine running on a weak mixture setting at high speed, on the ground, the model would take off rapidly, but, almost immediately, the jet would become pressurised by centrifugal force and the speed would drop to about 30 m.p.h.

In three other installations, the tank was progressively moved outwards towards the centreline of the jet until, with the tank centreline slightly to the offside of the jet, the Frog "500" ran virtually without varying its note throughout the entire stunt pattern. With the tank installed directly in line with the jet, however, even two-stroking was obtained in all manoeuvres but *not* in level flight where gravity was not so effective in overcoming the effects of centrifugal force. This is a condition which one still frequently witnesses. The solution, as we have pointed out, is quite simple.

To compare the current "500" with the original model, we stripped down both the new one and the

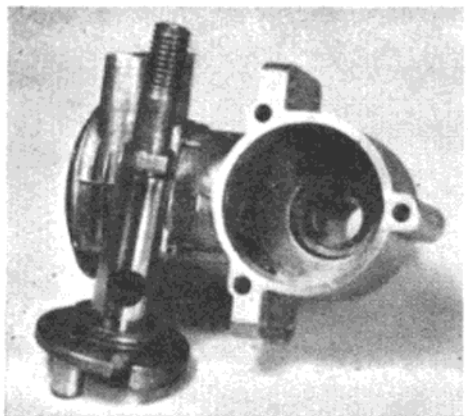
original 5½-year-old "500" which was used in the first M.A. test. Externally, the only feature that distinguishes the more recent engine is the much more robust beam mounting lugs of the new crankcase casting. Internally, the front wall of the crankcase is thicker and is recessed to accommodate a ⅝ in. o.d. thrust race against which the crankweb bears. The crankweb is very slightly reduced in thickness in order to keep the connecting-rod in the same plane as before. The thrust bearing is of the single row type and has eight balls and grooved steel tracks. The crankshaft journal diameter remains at ⅜ in., but now rotates in a bushing of Vandervell manufacture.

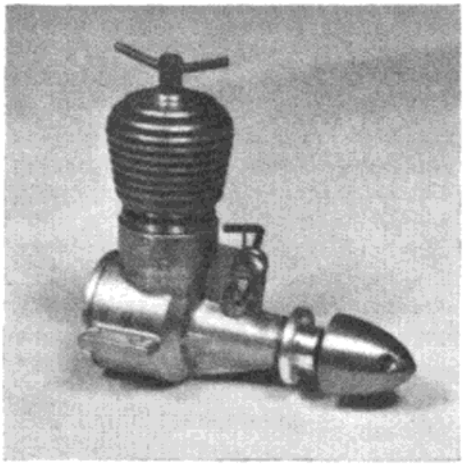
The addition of a thrust bearing to the crankshaft should be a worthwhile improvement, for it is a fact that the benefit accruing from ball-bearing mounted shafts, as opposed to plain journals, is partly from the reduced thrust loading so obtained and not solely from reduced frictional losses at the journal.

The output of the glowplug "500" on any moderately good racing fuel is *circa* 0.40 b.h.p. in the region of 13,000 r.p.m. Running on spark-ignition and a 3 : 1 S.B.P. 4 petroleum-spirit/S.A.E. 50 fuel, around 0.30 b.h.p. at 11,000 r.p.m. should be obtained. The engine weighs 7¾ oz.

Turning now from the largest to the smallest engine in the Frog range, we have the Mk. II "50" model. Externally the Mk. II can be distinguished from the Mk. I, introduced in 1952, by four points. Firstly, a longer fuel tank of considerably increased capacity is used;

The main modifications to the 1955 Frog 500 concern the crankcase and crankshaft. A Vandervell main bearing is now used in conjunction with a ball bearing thrust race.





The Graupner Taifun Rasant engine from Germany. This has a longer stroke than the Tornado model of the same swept volume and supersedes the Taifun Blitz model of last year.

secondly, the spray-bar assembly is inserted in the revised crankcase design at an angle, to bring the adjusting stem backward and away from the prop ; thirdly, the cylinder barrel is slightly different ; fourthly, a heavier compression lever is now used.

Looking up our notes on the "50" Mk. I, we find that the original, thin compression tommy-bar was one of the features we disliked; it became very hot and was extremely uncomfortable to adjust, particularly as the engine in question had a rather tight contra-piston. Testing the new model, we found the new tommy bar quite comfortable and the contra-piston fit was just right. The new angled needle-valve makes adjustment easier, too.

None of the little ½ c.c. diesels, British or foreign, are exactly one-flick starters and we cannot claim that the 50 Mk. II is any different in this respect, but, with the knack learned, the Mk. II runs extremely well. It is difficult to say on the strength of tests of single examples, whether the performance of the new model is superior to that of the Mk. I, but it was noted that the Mk. II maintained a more even running speed than the earlier type.

While the 50 Mk. II, at only 45s., is now, once again, the cheapest model aircraft engine currently available on the British market, the new 50 Mk. II Marine, at 65s. is the cheapest model power boat engine. The 1.49 c.c. Frog 150 is also available in a marine version, costing 70s. The 150's are also being produced in Mk. II versions, although, in this case, they retain the same main casting and are not outwardly different from the earlier models.

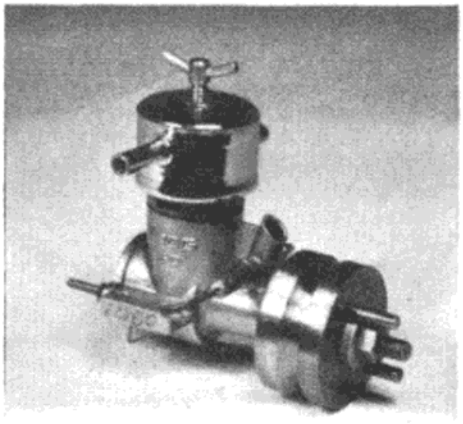
The marine models are, of course, water-cooled and the normal, aircraft, finned alloy cylinder barrel, which is screwed on to the upper section of the liner, is replaced by a screw-on water jacket with suitable inlet and outlet pipes. Each engine also includes a 3.1 oz. 1¼-in. dia. × ⅝-in. flywheel, grooved for a starting cord and accurately fitted to a matching crankshaft taper.

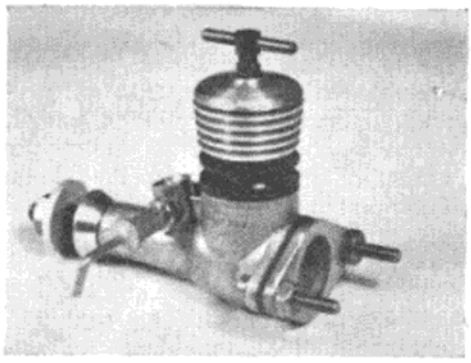
Turning now to the overseas products, one of the most interesting engines we have seen for a long time is the latest product from the Australian Sabre stable. An example of this engine recently reached us by air mail and the type has just been put on the Australian market. Having tested and used four different earlier examples of Gordon Burford's engines, we feel that this new 0.35 cu. in. model is the best motor he has thus far produced.

Stunt enthusiasts will observe that, outwardly, the Sabre 35 follows current American design practice and bears a likeness to the recent K. & B. Torpedo 36. In fact, the engine has certain features similar to the Fox 35 —the bore and stroke of 0.800 in. × 0.700 in. is, for example, the same— and it is probable that the Sabre endeavours to embody some of the best features from each design. In some respects, however, the Sabre is of superior construction to either of these American engines.

The crankcase, for example, is diecast in high silicon content (12 per cent.) aluminium alloy having an ultimate tensile strength of 17 tons/sq. in. It is a first class piece of work, very strong and excellently finished.

A Mk. II version of the Frog 150 has also been introduced. This is the water-cooled model which, incidentally, is the cheapest marine motor on the market.





A new product from one of the foremost Continental manufacturers: the Super-Tigre G.28 model of ½ c.c. capacity.

The cylinder is not left in the "soft" state but is hardened, ground and lapped. We checked this and there is no doubt that the surface really is hard. This, of course, means more work for the manufacturer and, although all users will benefit, it has been adopted primarily because flying conditions are frequently dusty in Australia and this plays havoc with the cylinders of some imported engines there.

Another feature of the Sabre is the relatively large main bearing clearance used. This is quite deliberate and, although it may go against some theory, has been adopted following considerable experiment. Most of the plain bearing American engines use fairly free fitting shafts nowadays and gain some performance thereby, particularly under light loads and high r.p.m. Large clearances are not necessarily to be recommended on plain bearing diesels, however.

The crankshaft, which is of 3 per cent. nickel steel, has a $\frac{7}{16}$-in. dia. main journal and a $\frac{3}{8}$-in. sq. induction port which remains open for 180 deg. of crank angle. The crank web is circular with a machined-in crescent counterbalance. The counterweight balances part of the connecting rod weight as well as rotating masses.

The piston is of Meehanite and the connecting rod is machined from Hiduminium RR.56 alloy. Cylinder ports, in the modern manner, are extremely large, the transfer port, for example, being no less than ¼ in. deep—although, of course, with a stroke of 0.700 in., this depth is not entirely uncovered at b.d.c., the lower edge of the port being cut below the level of the piston crown as a means of smoothing and accelerating gas flow into the cylinder by reducing the angle of entry.

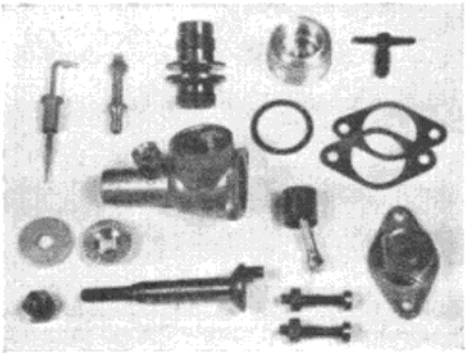
At a Sterling equivalent of only 89s. 6d., this engine represents exceptional value and is certainly worth investigation by stunt men who have hitherto relied on American products in the larger model sizes.

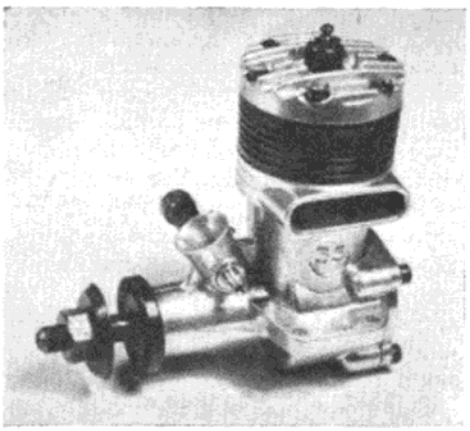
Our latest acquisition from Italy is the Super-Tigre *Tipo* G.28, which is Sig. Garofali's first venture into the ½ c.c. class. Weighing 1.35 oz., this is one of the smallest and most compact engines in the 0.5 c.c. group and is certainly one of the best performers. Power output was found to be above average in the ½ c.c. diesel class. Like all the Super-Tigres, the G.28 is really well made, with good casting and excellent machining and finishing. The porting is of the type introduced about 18 months ago on the 1 c.c. G.25 and 1.5 c.c. G.26 models and previously described in these articles. Briefly, it involves the use of large twin opposed exhaust ports with inclined transfer ports between them leading from an annular chamber below the cylinder flange. This chamber is supplied *via* three grooves in the wall of the crankcase, which interrupt the thread into which the cylinder liner is screwed.

In most other respects, the design of the G.28 is similar to standard U.S. Half-A engine practice. The diecast crankcase has a long bearing and has a diamond shaped flange at the rear, to which the recessed backplate is secured by two machine screws and nuts, these latter also serving as a means of bulkhead mounting the unit.

Also from the Continent are three recent German engines in the Taifun range, marketed by the large model firm of Johannes Graupner of Kirchheim-Teck. The Taifun engines first appeared a little over two years ago and, in this short time, some ten different models, beginning with a twin ball-bearing, shaft-valve unit, have been produced. One of these has already been dealt with in the Engine Tests series and all seven of the earlier engines have been previously described in MODEL AIRCRAFT.

The Super-Tigre G.28 displays excellent workmanship and has an above-average performance among ½ c.c. units.





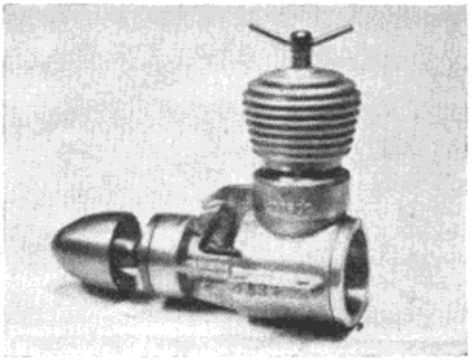
The first example to reach these shores of the new Sabre 35 which is just going on to the Australian market. The engine follows current American stunt 35 practice and is of excellent quality.

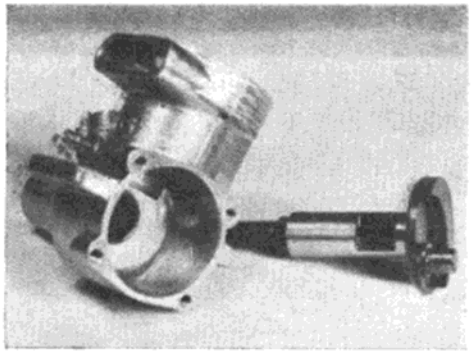
Present production, however, is being concentrated on the 1 c.c. "Hobby," 2.46 c.c. "Rasant" and 2.47 c.c. "Tornado" models which have superseded, respectively, the "Junior," "Blitz" and original Taifun-Rennmotor 2.5, while the 1.5 c.c. "Record" has also been dropped. The two remaining types, the 2.5 c.c. "Meteor" and the 3.5 c.c. "Super" disc-valve models are due for revision.

Each of the Taifun engines is a well finished and attractive looking unit. Crankcases are exceptionally well turned out diecastings which are pleasingly set off by machined and colour-anodised cylinder barrels and spinner nuts.

The main constructional differences between the "Hobby," "Rasant" and "Tornado" and the earlier types are in the crankcase and cylinder design. Earlier Taifuns used

The Taifun Tornado is a soundly made 2.47 c.c. unit having twin ball bearings and a 15 x 14 mm. bore and stroke. This engine replaces the shaft and disc valve 2.47 c.c. models first described in our January 1954 issue.



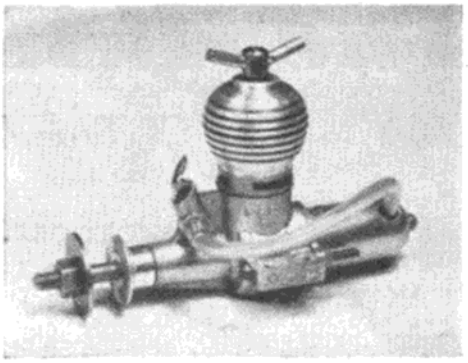


The Sabre 35 features an exceptionally well produced silicon-aluminium diecast crankcase and a counter-balanced nickel-steel shaft with rectangular induction port.

a cylinder design resembling that of the E.D. 2.46, in which a plain flanged liner was arranged to seat in a recess in the top of the crankcase, to provide a full 360-deg. transfer passage, and three long screws were used to secure the complete cylinder and barrel assembly to lugs cast on the sides of the crankcase. The present design, though not readily apparent from an outside examination, is entirely different. The cylinder liner now has internal transfer grooves and no flange. It screws into the upper section of the crankcase and is located axially by a suitable flange in the base of this section. The liner is thicker than that hitherto used and the barrel screws over a threaded section below the level of the contra-piston.

The performance of these new models is better than that of their predecessors, added to which they are slightly lighter. The "Hobby" keeps up the tradition of 1 c.c. diesel units of being the ideal size for beginners. It is an exceptionally easy handling engine, and with a very useful performance. The "Rasant" is a good general-purpose 2.5 of modest weight (3½ oz.) and has the 14 × 16 mm. bore and stroke commonly found on Continental engines of this type. The "Tornado," on the other hand, uses the equally favoured competition engine combination of a 15 mm. bore with a 14 mm. stroke. Capacities of the two engines are, respectively, 2.463 c.c. and 2.474 c.c.

All the Taifun engines are furnished with a beech test block, tommy-bar for the spinner-nut, and an instruction booklet printed in German, English, French and Spanish.



Improvements have been incorporated in the new Mk. II model Frog 50. Externally, these can be seen in the angled needle valve and improved compression lever.

The Short Seamew

Continued from page 300

rubber band across two small wire hooks on the top of each wing to retain the wings in flight, and they spring off in a bad landing. Sew the undercarriage wire legs firmly in place on the wings, and add the shock brackets. Cover with heavy-weight tissue.

Tail

This is simple and requires little explanation. The sub fin, with trim tab, is fixed to the top when finished. Holes are drilled to fit the locating dowels on fuselage fin half. The tail is retained with elastic bands across two small wire hooks. Fine trim is obtained by cutting or sanding away the fin supporting the tail.

Much scale detail can be added, such as arrester hook at tail, shock absorber detail, tail wheel fitting, slats on the underpart of the fin, which supports the tailplane in position, radar dome on the nose, and so on. (We don't recommend the latter for a flying job.)

Finish

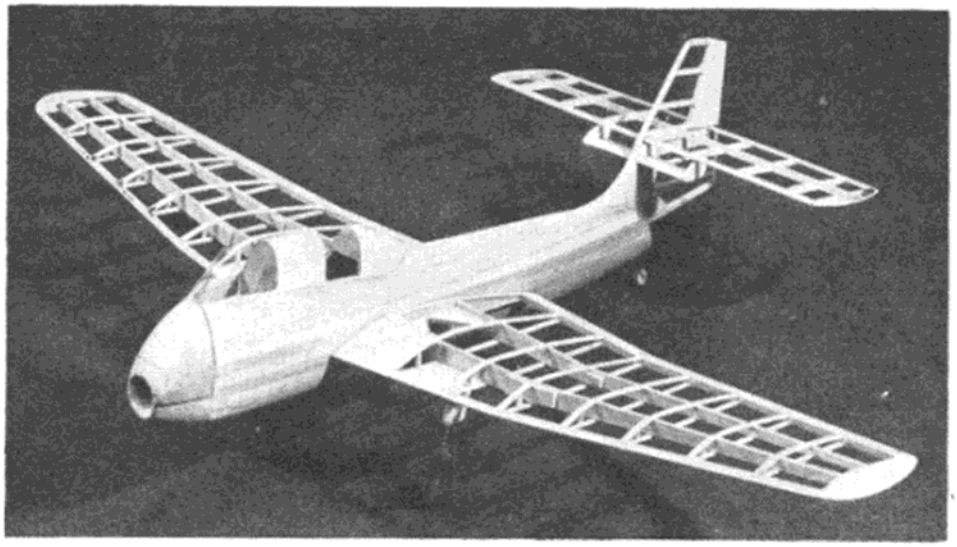
Standard Royal Navy finish is pale green glossy on the under surfaces, and slate green-grey upper surfaces. Roundels are equal red, white and blue. Royal Navy in black on the fuselage with serial number.

Put a cork in the tail tube, and pour in fuel proofer. When it is well soaked in, drain off again, and dry. The excess fuel, so fond of spraying a scale model in flight, is largely carried away in this tube, by the combination of blow at the front through the annular intake round the prop., and the suction at the tail.

Last Words

Aim for a dead straight glide by adjusting the tail and trim tab. Fix securely in place, and touch nothing else except the thrust line. Have the motor holes drilled a little large to give a little side play adjustment to counter a sharp turn, particularly to the right, which is fatal. Kill the power stall with washers under the rear lugs. The model will not easily break, especially if the wings are allowed to come off in a rough landing.

If you own a *Seamew*, you at least have something different. It cannot be mistaken for any other aircraft we know of and in the air it is well worth watching.



The DANISH NATIONALS

REPORTED & PHOTOGRAPHED BY PER WEISHAUPT

THE Danish National Championship competitions were this year held at Odense airport, the venue of last year's World Championships. The weather had not improved much since last year and a high wind was blowing again, but the rain held off.

Svend Pedersen, who was the best Dane at the World Glider Championship contest last year, became Danish 1955 Champion with 624 secs., only three seconds in front of Børge Hansen. Arne Hansen from Odense was third with 559 secs., while the former world champion, Hans Hansen, placed 7th with 436 secs.

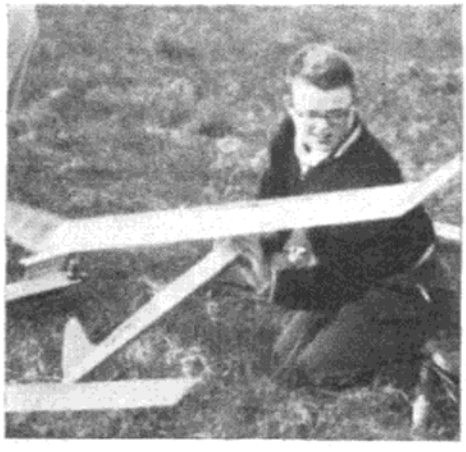
The new Danish models, which last year had been extensively test flown in calm weather and therefore did not perform well at the world championship, have now proved that they fly equally well in windy weather.

Wakefield models continue to improve in Denmark, and generally flew well in spite of the weather. The 1955 Wakefield champion was Erik Nienstaedt of Gentofte, with 732 secs., followed by K. Widell, Sportsflyveklubben, with 639 secs., and the former champion, Bjarne Jorgensen, with 463 secs.

F/F power models have never been fully developed in Denmark, and during the later years they have seemed very unimpressive. Last year's winner, Erik Johansen from Haslev, regained his championship with 502 secs.

For the first time a competition for R/C models should have taken place at the championships in Odense. Because of the weather and their inexperience, the six modellers wisely decided to postpone the contest.

Denmark expects to take part in all four world championships this year. Full teams are expected in A2, Wakefield and perhaps speed, while only one man expects to take part in F/F power. The teams will be selected by the Model Committee of the Royal Danish Aeroclub very soon and the A2 team will probably be the same as last year.



Heading photo shows Erik Nienstaedt, Danish Wakefield champion. Left: Erik Johansen, F/F Power champ. Below: Freddy Adelvard's R/C model. Right: Svend Pedersen, A2 champion.

RESULTS—

Wakefield:	I. E. Nienstaedt	... 7 : 32
A.2 Glider:	I. S. Pedersen	... 624 sec.
Power:	I. E. Johansen	... 502 sec.

Topical Twists

Sand-Storm

The most crushing way to insult this column is to take it seriously. When someone does I dolefully exchange my corn-flake cut-out Jester's outfit for the conical, but no less comical, headgear, inscribed with a large D, and retire into a dark corner.

The latest sober-sided criticism to bring about this quick-change act comes from a northern bod, styling himself " Sand-grounder." Now, not being an expert in the more obscure occupations of the northern natives, I don't pretend to know what sort of dismal operation a " Sandgrounder " must perform for his daily crust, but I will be charitable enough to put his peevish attitude down to a particularly rough session with Gilbert Harding in " What's my Line ? " and leave it at that.

Anyway, he takes me to task over a slight geographical inaccuracy in the number of damp miles which separate Southport from Manchester. He also takes pains to remind me that Southport is near Blackpool, where he can remember countless thousands of human fritters being grilled to a turn.

Well, I can only assume that he has a long and ancient memory, in which case he may have found the Wilfred Pickles programme more to his book. Or, perhaps, he has been delving into old municipal records. If so, he possibly came across a reference to the appearance over the city of a large, glowing body, sometime towards the end of the last century. The town councillors, uncertain of the nature of the phenomenon, but boldly enterprising as always, erected a large steel tower, from which it was hoped to capture the mysterious orb for the purpose of using it as a centrepiece in the illumination scheme. The ruse proved unsuccessful, but the elusive sphere did make one or two return journeys to hover tantalisingly over the Tower, until eventually it was frightened away for ever by the organ music.

This explains why, on the crowded beaches, the atmosphere is warmed not by thermonuclear energy but by the thermo-human element in dense concentration, and why the nearest thing the younger generation have seen to the sun is the almost white hot radiance of Uncle Fred's nose as he dips an exploratory toe into the ice-cold briny.

Flying on the Brain

Back in the old days R/C was simply a matter of flipping a fin about in order to execute a number of realistic aerial manœuvres which can be found in any aircraft manual under the heading " When to Bale Out." All rather crude, but good clean family fun, with crack-ups, fly-aways, and disaster enough to satisfy the most primitive urges of the ghoulish onlookers.

But that's all old history. We have moved into a new electronic era of multi channel control, with the simple receiving set replaced by a sort of electronic brain that can fly the model through a series of inverted bunts and work out the Election results at the same time. The archaic bleep button has given way to a jolly little joystick, and the happy, carefree operator can enjoy his fun without his oral cavity being encumbered by the presence of his cardiac organ.

At this point I put away the model books and went out to face the stark reality of a modern radio event. The first noticeable improvement in flying technique was the smooth nature of the r.o.g. attempts; each model running straight and true across the tarmac and embedding itself cleanly in the grass verge. Only occasionally was a model smitten with the more flippant delights of the pre-electronic age. expressing its unfettered gaiety in a series of frolicking ground loops. The crowd-pranging manœuvre was also of a more polished order, with greatly increased range. The dive-in scramble, which at one time was the exclusive delight of the more adventurous spectator at the take-off area, now provided athletic fun for even the most distant onlooker.

Otherwise everything seemed to be in the good old bang-bang rudder tradition, with the crowd clapping respectfully when a model made a safe return to earth, and cheering wildly when one didn't. But perhaps on this occasion the electronic brains were suffering from clots, although possibly it would be unfair to attach too much blame to the operators.

Letters on metal wallpaper have been so numerous of late that, by now, the subject should be more fully covered than a one armed paperhanger.

Spirit of Youth

Aerodromes are getting in pretty short supply; at least as far as model flying is concerned. This state of affairs is attributed to the juvenile antics of the type of youth who is usually referred to as air-minded, although it is generally recommended that brain is a more effective head-filling agent. When unleashed on to an airfield they immediately set up a highly organised fuel bottle dispersal system, through which the empties are dumped in all the strategic positions of greatest nuisance value. Other activities include the establishment of new airfield access points (" See that we bring a decent pair of wire clippers next time ") and general arson and skulduggery on a grand scale. What intrigues me, though, is this fuel bottle business. Judging by the prodigious number of empties they leave behind, that ½ c.c. engine (never been flown) which is their only slight connection with model flying, must have a fuel consumption comparable with that of an airline fleet.

" Let's ask them if they've seen our cross-Channel R/C job."

Timers, Gentlemen, Please !

We hear that Jim Walker, noted C/L expert, who made the headlines, as it were, by a nifty spot of cranial control, is still going just as strong as his equally famous namesake, Johnny. Which makes us wonder if, after one of his three-model gyratory sessions, he suffers the same dizzy after effects as is produced by that gentleman's beverage.

Speaking of hangovers, we are pleased to usher into the fold the newly affiliated Freemasons Arms Model Club; a club which obviously believes in combining model business with pleasure. The members, we are told, although filled with the right spirit, have no connection with those tap-room aeronauts, known as barflys; nor is it likely that model operations will be hampered by too many strong down-draughts. However, it is interesting to conjecture on some of the remarks that might be overheard on any convivial evening:

" Ur-r-r. Moighty strong dropee cider this. . . . "

" Has anyone seen my glowplug fuel ? "

" . . . Took one look at George's pylon job and signed the pledge. . . . "

" Lifted any good pots, lately ? "

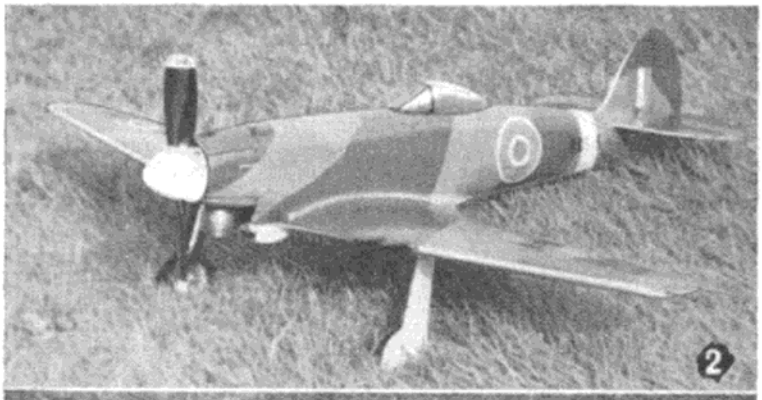
Pylonius

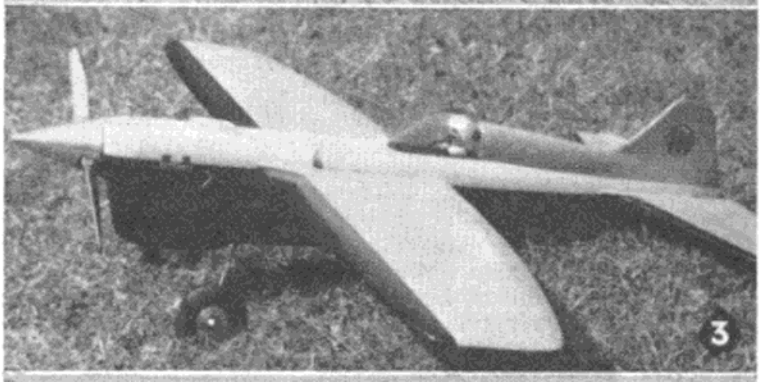
PHOTONEWS

PHOTOGRAPHER B. R. Bower clicked the camera at the right moment to catch Brian Faulkner, in our first photograph, test gliding his Attwood 0.49 powered ½A model, which took first in its class at a contest organised last year at Burtonwood Air Base.

Built from "M.A." plan 183 is the *Spiteful* owned by I. M. Thomas in photo **No. 2.** Power is *via* an Elfin 2.49 motor with a 7 × 8 in. propeller, giving an average speed of about 60 m.p.h. The colour scheme is sea grey, dark green upper and sky below, and the model bears one of the few production serial numbers. Photograph by G. E. J. Gray of London.

A Mark 3c ETA 29 engine drives the class "B" team racer in photo **No. 3.** Colour scheme is black, white and yellow and the model was built by J. R. Campbell of Wokingham who is very pleased with his home made pilot, "it is the best I have made up till now" he writes.



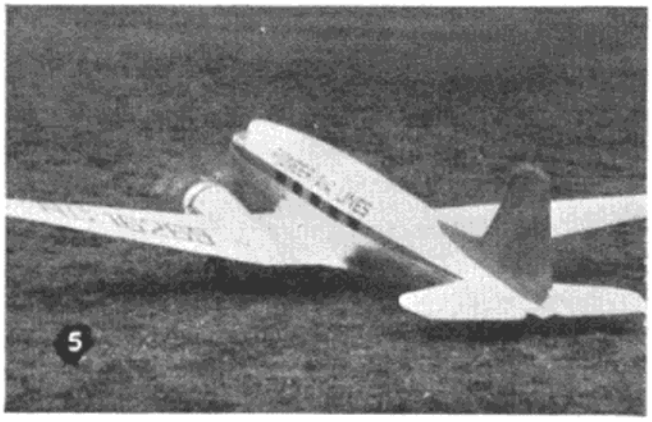


Man who doesn't mind getting his feet wet is B. McBride of Gibraltar, who sent us a picture of his C/L *Sunderland* seen in photo **No. 4.** The plans were scaled up from a 1/72nd scale drawing, and judging by the *Sunderland's* appearance, he has made a fine all round job of it. Only two E.D. 3.46's are used, and they give an impressive scale flight appearance on a line length of 70 ft. Originally the model was flown, with the addition of a beach landing gear type of undercarriage, from hard ground, but our friend plucked up courage to fly off the sea, thus dispensing with the landing gear. The result, we think you will agree, is well worth while.

Probably its twin engines has precluded the ubiquitous D.C.3 from the ranks of the "'planes most modelled," but this feature did not deter C. Paschmann of Germany, who, as can be seen from photo **No. 5** has done the old "Dak" full justice. Model gets that authentic appearance by the use of metallised paper for covering, and the engines seen revving up are two Webra "Winners." First rate lettering puts the finishing touch to this C/L job.

Photo **No. 6** of a 1/48th solid scale North American A.36 *Invader* (dive bomber version of the *Mustang*), was built by B. A. Smith and realistically posed and photographed by J. E. Banks of Eastbourne. The model is finished in the R.A.F. day fighter colour scheme of the 1944 period. In order to give a good surface for the dope, the model was covered with aluminium wallpaper after the application of the sanding sealer.

In photo **No. 7.** Eddie McLean of the Banff M.A.C. displays a *Swift* F.1 which he built for fellow club member John Bodie from a Jetex "Tailored"

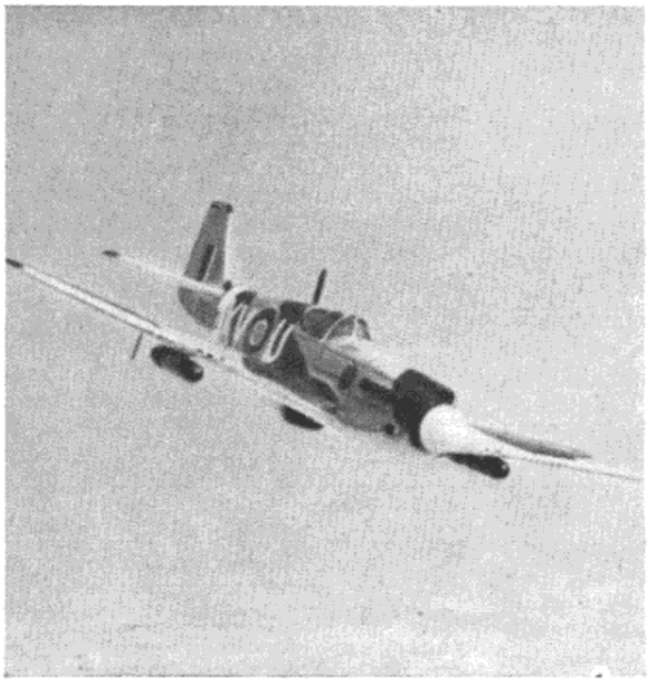


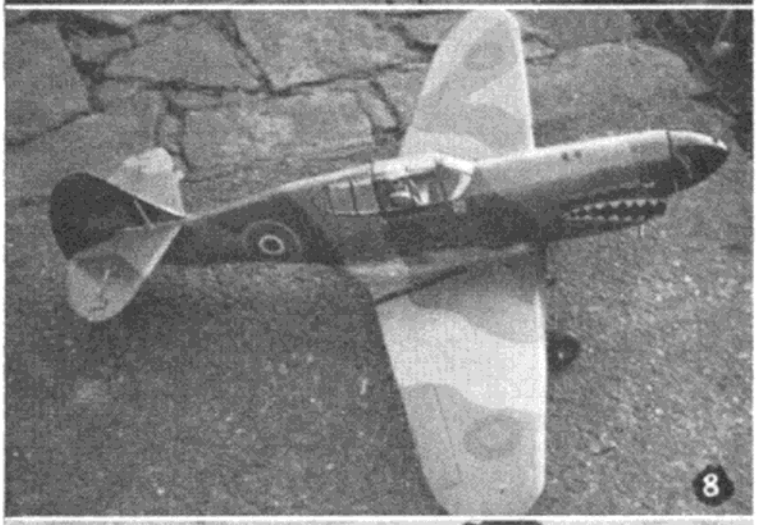
kit. Power comes from a Jetmaster unit with augmentor tube, and Eddie tells us the performance is well up to expectations.

Western Desert types will no doubt remember the old Curtiss *Kittyhawk*, and in photo **No. 8** is a class " A " racer version built by Bill Hume of the Seaham D.M.C. The model is fully to scale, even to the tail area, and it can do over a mile a minute.

The two-year-old model of a *Taurus* seen in photo **No. 9** was slightly modified from the original so that A. Dowdeswell of Gloucester could, cowl the McCoy 60 Redhead engine. The wingspan is 5 ft., and the model will " do the stunt schedule " on 85 ft. lines, and on 100 ft. lines, looks most impressive. The engine consumes a half bottle of fuel per flight, which is usually a " home brew " for economy. During its two years of flying the only repair necessary has been a new tailplane, the original being torn out during a gale.

Tynemouth M.A.C. member, C. Pollard, is featured with his latest Wakefield design in photo **No. 10.** The main dimensions of the model are, wingspan 51 in., fuselage length, 53 in., propeller diameter 25 in. The designer quotes a still air performance of about 3½ min. Tynemouth M.A.C. chairman, R. Nichols, submitted the photograph.





METALS

THE lightest of the practical "structural" metals are the magnesium alloys which weigh about ten times as much as light-medium balsa, or roughly three times that of spruce. Thus to be used as spars or longerons of similar weight, the cross section of the magnesium used would have to be reduced in similar proportions. This means, for example, that to "duplicate" ¼ in. sq. balsa in magnesium, with no weight increase, would call for 0.08 in. square section metal, which would almost certainly suffer from lack of local strength. The position is improved if we use extruded section metal to increase the stiffness without increasing the actual cross sectional area, but again local weakness remains a problem.

The result is that in the light of our present knowledge at least, a practical metal airframe must weigh more than its balsa wood counterpart in model aircraft sizes in order to achieve comparable *local* strength, although the resulting *overall* strength may then be much higher. But both magnesium and aluminium alloy sections have been used with success on F/F models, the Frog Pioneer kit model being the most recent, and in fact the first really comprehensive model of the type yet produced.

Since metal airframe construction in general and the design features of the Pioneer in particular were described last month, we will not elaborate further on the use of metals for spars and longerons, etc., except to include the test data summarised in Table I. These figures were obtained to compare Frog extruded magnesium section with selected 3/16 in. sq. and ¼ in. sq. balsa longeron stock or the cross sections which would normally be chosen for similar duties. One feature which these data do not illustrate is that metal is much more consistent in performance than wood (particularly balsa).

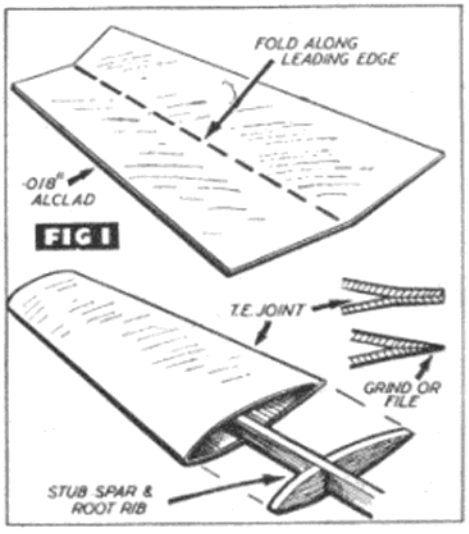


FIG I

Sheet metal, as opposed to extruded or formed sections, is more widely adaptable to model aircraft needs, although again carries with it a definite weight penalty. Sheet aluminium, for example, is some 16 times heavier than balsa sheet of the grade which would be used for "skinning," although of course the sheet metal can be much thinner for the same job. If so thin that the weight becomes more directly comparable, however, it will not be rigid enough to remain smooth and unwrinkled. Further, aluminium is a soft metal, readily dented or stretched. For any form of stressed skin covering, therefore, a harder (and somewhat heavier) aluminium alloy is generally better, such as Alclad or dural. Dural or duralumin is really a generic name which can be applied to a range of age-hardening and relatively strong aluminium alloys. Alclad is essentially dural with a thin coating of pure aluminium, which is more corrosion-resistant than the alloy.

Aluminium can be used for making cowlings, exhaust deflectors, drip trays, etc., on power models, but it is not suitable for cantilever motor mounts on account of its softness, although hard aluminium may be satisfactory. It can also be used for wing ribs, although if these are to have the necessary rigidity, a drawing or forming job is necessary to give the rib section a flange.

Table II summarised some tests made on Pioneer ribs, which are formed from 0.010 in. aluminium and 3/32 quarter-grain balsa ribs of identical size. The metal ribs are more than twice as heavy, but slightly stronger in nearly all directions of loading. These tests were unfavourable to the metal ribs since these were complete with spar cut-outs, etc., whereas the wooden ribs were un-notched on the basis that in a practical assembly the notches would be completely filled by the spars cemented in place. On an overall basis, metal ribs of this type are quite attractive, their main limitation being difficulty of production.

So far the question of weight has been considered with respect to F/F models. In the case of C/L models, weight control is less critical, and metal and mixed metal-wood construction has been used on such designs for some considerable time. Discounting the pre-fabricated stressed-skin all-metal models, metal-skinned wings are well within the capabilities of the average modeller, particularly for speed designs.

To keep manufacture as straightforward as possible, straight-tapered wings are to be preferred for metal stressed-skin construction, although

TABLE I

LONGERONS	FROG PIONEER		BALSA 3/16	BALSA 4/4
WEIGHT-OZ-10"	·120	·120	·035	·064
9" LOAD OZ.	DEFLECTION UNDER LOAD			
1	1	15	25	075
2	2	3	5	15
8	2·0	3·0	BROKE	1·1
	PERMANENT SET			BREAKS-10
2" LOAD TO BREAK	24 LB	—	8 LB	18 LB

there is no reason why a curved trailing edge outline should not be used. The method consists of folding alloy sheet around a stub spar (and ribs, if necessary) to the required aerofoil section and joining the two edges of the sheet along the trailing edge—Fig. 1. Tips can be of metal (e.g. filed from solid aluminium), wood or plastic, glued or screwed in place. Similarly the wing skin is glued or screwed to the mainspar. A suitable material for the skin is 0.018 in. Alclad or similar for wing panels up to about 15 in. There is no reason why the same thickness of sheet should not be used for larger wings, but more internal structure would be needed for local stiffening and the overall weight of the wing would be quite high on account of the weight of the sheet—see Table III.

Shaping the sheet itself is relatively straightforward. The pattern can be developed by drafting, or a paper mock-up employed, trimmed *in situ*, and used as a master pattern for cutting the wing sheets. The main problem is how to join the sheet

TABLE II

RIB	WEIGHT PER RIB (OZ.)	BENDING TO BREAK	BUCKLING TO FAIL	CRUSHING TO FAIL
BALSA	·032	12-16 OZ	5-6 LB	10 LB
METAL	·076	12-16 OZ	—	8LB
METAL	·076	30-34 OZ	7 LB	

TABLE IIIB. BRASS SHEET & STRIP

S.W.G.	Thickness (in.)	Weight oz./sq. in.	Application
28	0.0148	0.073	Range of sizes most suitable for fuel tanks.
29	0.0136	0.067	
30	0.0124	0.061	
31	0.0116	0.057	
32	0.0108	0.053	
33	0.0100	0.050	
34	0.0092	0.045	
35	0.0084	0.041	
36	0.0076	0.038	
37	0.0068	0.034	
38	0.0060	0.030	

NOTE: Brass less than 0.006 in. thick is known as *foil*. 38 S.W.G. and thicker material is known as *strip*, or *sheet* if 18 in. wide or over.

along the trailing edge.

In an American commercial model employing this type of construction (the McCoy Invader Class "B" C/L speed model), the two sheets were spot welded. For amateur construction riveting is obviously a more practical solution. There is no reason, however, why a perfectly satisfactory glued joint should not be made.

We have purposely omitted to mention one of the other major problems of metal assemblies—how to get satisfactory joints—until this point. Bolting or the use of self-tapping screws is obvious, but inclined to be rather clumsy and not applicable to stressed skin panels without spoiling the appearance. Riveting is generally good, but a bit tricky in the sizes of component we are handling. Soldering is a distinct possibility, but in spite of the introduction of modern aluminium solders and special fluxes, the soldering of such metals is still a skilled job. Especially with thin sheet it is all too easy to burn right through the metal in bringing the joint area up to the right temperature for the solder to flow. Thus gluing, if it can give satisfactory results, is the most attractive fastening method of all.

Broadly speaking, there are only two major types of adhesive available in this country which are suitable for gluing metals—rubber-base adhesives and special metal-bonding resins. The former retain a certain amount of elasticity when set and so are not suitable for stressed joints.

Of the resin-type metal adhesives, two are approved for full size aircraft work in this country. One (Redux) is out of the question for our purpose since the bond is completed by applying heat and pressure under controlled conditions. The other, Araldite, is a heat-setting resin which is also available in cold-setting form.

Tests with Araldite have shown that with the heat-setting type the bond obtained with aluminium is stronger than the base metal. The cold-setting type, easier to use in the model workshop, does not give the same high joint strength, but is quite satisfactory for light to moderately stressed joints. Nor is the bond restricted to metal-to-metal joints for metal can be "cemented" to ply, balsa, etc., with similar satisfactory results.

Convincing proof of this was given by bonding aluminium and Alclad motor mounts to ply bulkheads, using heat-setting Araldite and subsequently mounting the motors and running them with the ply gripped in a vice. The bonded joints stood up under this severe test and the only evidence of incipient failure was in the aluminium of the first pair of mounts.

Aluminium alloy for undercarriage legs was originally introduced for team racers, a type of construction which has now spread to F/F models with some success. Two major

TABLE IIIC. TINPLATE

Thickness (in.)	Weight oz./sq. in.	Application
0.0075	0.0336	Fuel tanks 1/72nd scale propellers, solderable brackets, etc. Undercart fixing.
0.010	0.0456	
0.0125	0.0590	
0.015	0.0672	

NOTE:—Tinplate is sheet steel with a coating of tin, generally less than 1/10,000 in. thick.

TABLE IV. MODEL AIRCRAFT METALS

Metal	Weight oz./cu. in.	Form	Applications
Alclad	1.624	Sheet	Cantilever undercarriages; stressed skin wing panels (C/L); bellcranks, pressed fuselages (C/L); and cowlings; cantilever motor mounts.
Aluminium ...	1.56	Sheet	Cowlings, light fairings, small bellcranks; pressed formers; ribs; shells.
		Tube	Wheel and propeller bushes, etc.
		Wire	Fin outlines.
		Foil	Metallised covering.
Brass	4.912	Strip and sheet ...	Fuel tanks (C/L).
		Tube	Bushes.
		Plate and rod ...	Gears.
Dural	1.624	Sheet	Cantilever undercarriages, stressed skin wing panels; bellcranks; motor mounts.
		Rod	Gears.
Magnesium Alloys	1.04	Extruded Sections	"Frog" spar and longeron sections; cast C/L model pans.
Lead	6.56	Shot or solid ...	Ballast weights.
Solder	5.44	—	Ballast weights; metal jointing.
Tinplate ...	4.53	Sheet	Fuel tanks; undercarriage fitting.

NOTE:—Metal-faced laminates offer interesting possibilities for model aircraft work but are, as yet, relatively unexploited in this field. The basis of these laminates is a core of light, rigid material—e.g., balsa, expanded plastic, etc.—with thin aluminium or light alloy facings bonded in place.

TABLE III. SHEET METAL DATA

Size		Magnesium alloy	Alclad and Dural		Aluminium	
s.w.g.	Thickness (in.)	Weight oz./sq. in.	oz./sq. in.	Use(s)	oz./sq. in.	Use(s)
14	0.080	—	0.130	U/C lags. Control plates. Control horns.	0.125	
16	0.064	0.0645	0.104		0.100	Control plates and horns.
17	0.056	0.0565	0.091		0.087	
18	0.048	0.0483	0.078		0.075	
20	0.036	0.0362	0.058		0.056	
21	0.032	0.0322	0.052		0.050	
22	0.028	0.0282	0.045	C/L Model. Slab tailplanes.	0 044	
23	0.024	0.0242	0.039		0.037	Cowlings.
29	0.022	0.0222	0.036		0.034	
25	0.020	0.0202	0.032	C/L model. Stressed skin wings.	0.032	
26	0.018	0.0182	0.029		0.028	
27	0.0164	0.0165	0.027		0.026	
28	0.0148	0.0149	0.024		0.023	Light fairings.
29	0.0136	0.0137	0.022		0.021	
30	0 0124	0.0125	0.020		0.019	
31	0.0116		—		0.018	
32	0.0108		—		0.017	Ribs and formers (pressings).
33	0.0100		—		0.016	
34	0.0092		—		0.015	
35	0.0084		—		—	
36	0.0076		—		—	
38	0.0060		—		0.009	
40	0.0048		—		—	
42	0.0040		—		0.006	
44	0.0032		—		—	
45	0.0028		—		0.0044	Metallized covering.
50	0.0010		—		0.0016	

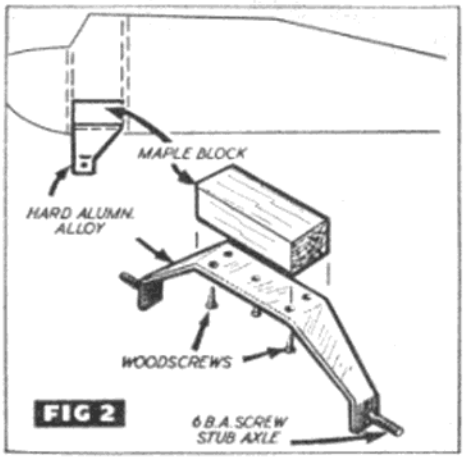


FIG 2

factors are: use of the right alloy, and a secure fixing to the fuselage (or wings, as the case may be). Regarding cutting and bending the metal to shape, tinsnips can be used up to 18 S.W.G. thickness, although a hacksaw is nearly as quick and is suitable for all thicknesses.

Alloys of the type used are brittle and cannot be bent through sharp angles without cracking right through. The procedure is to soften the metal by heating, quenching immediately in water. The metal then remains soft for some 24 hours during which time it can readily be bent to the shape required. It regains its original strength after this "ageing" period.

An undercarriage of this type will work out quite heavy (comparative weights can be worked out, based on sheet metal area, from Table III), unless the track is fairly narrow and the length of leg short. It does, however, fit in well with the type of R/C model design employing a deep fuselage. De Bolt, for instance, uses this type of undercarriage on his *Live Wire* series of models—Fig. 2. The undercarriage is fastened to a block of hardwood (maple) by woodscrews cemented between formers at the bottom of the fuselage. A rather better type of fixing is shown in Fig. 3, the undercarriage being bolted to a ply-balsa block-ply sandwich, which again is cemented between formers. The greater depth of fixing block gives a more stable fixing since the stress is better distributed. Also the total weight is less than using a shallower hardwood block.

The use of metal for various other components—e.g. fuel tanks, bushes, small fittings, etc.—is too well known to require description, but some leading data are summarised in Table V where, particularly, the specific weights of the various metals are useful for comparison.

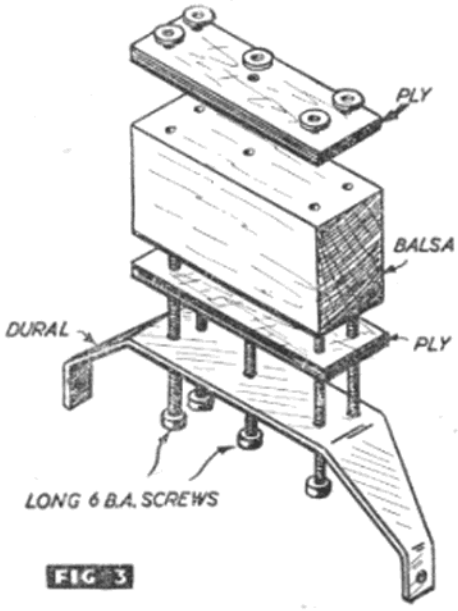
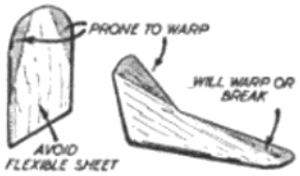


FIG 3

DESIGN TIPS No. 7



All-sheet construction is very attractive for small tail units, etc., on flying models. But from the constructional time you save, spare a little for some extra attention to design and material selection.

There are three factors to watch—strength, weight and resistance to warping. For a start, reject flexible sheet for the job, or a sheet which is not true when sighted along its edge.

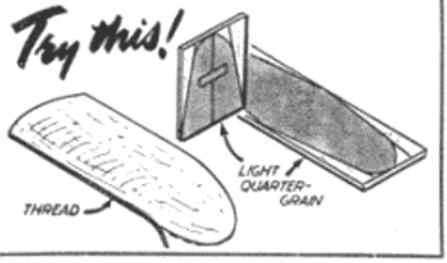
You want rigid quarter-grain stock for all-sheet surfaces. The type of wood which will crack rather than give when you try to bend it across its width. You can recognise this type of sheet by the speckled appearance of the surface, but it is not always easy to come by. A lot of quarter-grain stock is rather too heavy, so select by weight as well as appearance.

Really light quarter-grain sheet is excellent. If you want a bit more strength, go for a thicker sheet.

Some shapes are bad, too. Tapered surfaces are best, fitting the actual outline within straight taper outlines with the tip chord not more than two-thirds the root chord. Parallel shapes with rounded tips are always prone to warp. Swept-back surfaces are also weak, cut from one piece. Tip portions are always prone to break off or warp out of line.

Keys of harder balsa inset flush with the grain direction at right angles are a good idea for reinforcing joins in sheet. They also act as anti-warp braces used in unjoined sheet surfaces. Sheet thickness commonly favoured is $\frac{1}{16}$ in. for all tail surfaces, with a limit on tailplane span of about 8 in. Use 3/32 or $\frac{1}{8}$ in. sheet for power model fins.

Chuck glider wings are usually deep enough to resist warping, but protecting the leading edge with a length of thread cemented in place is a good tip. Acts as a turbulator, too, which tends to improve performance. Quarter-grain again for wings, just to be on the safe side. This time you can use up to $\frac{1}{4}$ in. thickness. Above about 24 in. span, weight penalty favours built-up construction.



The SEAMEW

Continued from page 306

or depth charges, while sonobuoys or other stores can be carried on underwing racks. The wing is power folded for stowage in aircraft carrier hangars, and in this position the maximum width is 23 ft. The "break" for folding is in line with the extremities of the wide tailplane, and thus the fuel tanks are located in the inner wing panels.

The crew of two in the tandem cockpits have an excellent view, and this coupled with a high standard of manoeuvrability must make the *Seamew* a pleasant aeroplane to fly—as well as a very safe one.

An Armstrong Siddeley Mamba Ma. 1,320 e.s.h.p. turboprop powered the prototype *Seamew*, but the production version, the *Seamew* A.S.1, has the 1,590 s.h.p., A.S. Ma. 6 unit driving a four bladed propeller.

SHORT SEAMEW DATA

Type: Two seat anti-submarine strike aircraft. Dimensions: span, 55 ft.; length, 41 ft.; height (taildown) 13 ft. 5 in. Engine: One Armstrong Siddeley Mamba A.S. Ma. 6. Weight loaded: 14,000 lb. Performance: No details available for publication.

NORTHERN HEIGHTS GALA DAY

A change of venue from Hawker's aerodrome at Langley to R.A.F. Station, Halton, in no way altered the familiar and enjoyable pattern of Northern Heights M.F.C.'s gala day. Even the fine weather found its way from Langley to Halton.

There was something to interest everyone, from ornithopters to combat, and the "free-lance" fliers too, made good use of the facilities.

Vice-president of the club, Air Chief Marshall Sir Hugh P. Lloyd, G.B.E., K.C.B., M.C., D.F.C., presided over the meeting, and before the prize-giving read a message of good wishes from H.M. The Queen. Lady Boyle obviously enjoyed presenting the prizes as much as the winners enjoyed receiving them!

CONTEST RESULTS

Queen Elizabeth Cup

1.	D. Aldridge	Letchworth	972	pts.
2.	P. Buskell	Surbiton	954	,,
3.	T. Woodward	Foresters	885	,,

Flight Cup Open Gliders

1.	E. R. Welbourne	Hayes	8 : 00 + 2 : 00
2.	A. Whiting	Northwick Park	8 : 00 + 1 : 57
3.	J. Brewin	Leicester	8 : 00 + 1 : 27

Fairey Cup Open Rubber

1.	J. O'Donnell	Whitefield	8 : 00 + 4 : 59
2.	M. Green	Croydon	8 : 00 + 3 : 24
3.	E. Bennett	Croydon	8 : 00 + 3 : 07

Thurston Helicopter Trophy

1.	C. M. Ingram	Southampton	232	pts.
2.	I. Dowsett	West Middlesex	136	,,
3.	A. Hodgson		94	,,

D.H. Trophy Open Power

1.	B. C. Gunter	B.O.A.C.	8 : 00
2.	D. Posner	N.W. Middlesex	6 : 00 + 42
3.	V. Jays	Country Member	5 : 00 + 57

Keil Combat Cup

1.	M. Smith	High Wycombe
2.	M. Dilly	Croydon
3.	M. Phillips	West Bromwich

Concours Sect. I Power

M. Gaster ... Country Member

Sect. II. General

C. Read

Sect. III. Flying Scale

A. J. Briggs ... Park M.A.L.

Sect. IV. Unorthodox

J. Marshall ... Hayes

R.A.F. Review Cup Radio Control

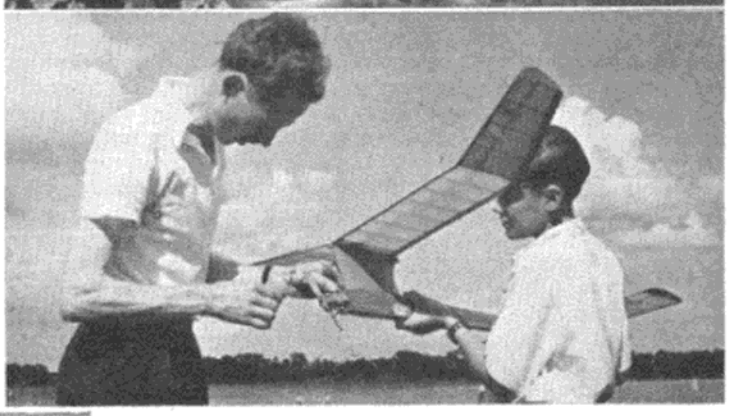
1.	J. Fox	Hatfield	11 yd.
2.	H. J. Bachelor	Letchworth	16 yd.
3	G. W. Merrick	Worcester	16 yd. 1 ft.

Gala Champion A.M. Challenge Cup

E. R. Welbourne ... Hayes

R.A.F.M.A.A. Apprentices' & Boy Entrants' Event

1.	Webb	R.A.F. Cosford
2.	Lellow	R.A.F. Cosford
3.	Osbourne	R.A.F. Halton



Above, top. The combat event with its thrills and spectacle drew a big crowd all day.

Above, centre. Lady Boyle presents Webb, the winner of the Apprentices' and Boy Entrants' event with the cup.

Above. Refuelling his model to fly in the power event for the D.H. Trophy is G. R. French.

Left, top. D. Aldridge, of Letchworth, the smiling winner of the Queen Elizabeth trophy.

Left, centre. Mike Aspinal's sailplane about to be launched in the open glider event.

Left, insert. In the final for the new Keil Combat Cup, M. Dilly's model shows signs of damage.

Left, bottom. John O'Donnell competing in the rubber, launches in the fly-off to win the event.

Left bottom centre. The winning combat team prepare to fly, Mr. Smith (centre) and R. Edmunds (right).

Below. The Cheltenham club provided the carrier for this event which drew a crowd when models were flown.

MODEL AERODYNAMICS No. 8

Technically it is wrong to speak of even a one-piece wing as a single unit. Complete wings are a pair, whether separate or integral. Span and chord dimensions are logical in the case of a rectangular wing—Fig. 1. When the wing is straight-tapered, it has three vital chord dimensions—root, tip and mean or average chord. With compound taper, each section of the wing is treated separately and the mean chord found for each, e.g. M1 and M2. The final mean chord M3 can be calculated by geometry. In the case of elliptic wings, or similar curved outlines, consider the root chord only as more convenient.

The aspect ratio (designated A.R.) of a wing is the ratio of the span to the mean chord. Where the mean chord is not easily established, aspect ratio can easily be calculated in a different way, i.e. A.R = (span)^2 ÷ wing area. This formula also gives span required for a given aspect ratio and area.

The usual range of aspect ratios for model wings is between 6 and 8 : 1. Higher aspect ratios are sometimes used, but very seldom more than 12 : 1. Low aspect ratios are confined almost exclusively to tailplane shapes.

Aerodynamically, the higher the aspect ratio the lower the overall drag of the wing for a given lift generated, i.e. the greater its efficiency. Consider the two wings shown in Fig. 3, which are of the same area, generating the same lift, but of different aspect ratios. Each part of the wing is contributing lift and so if the span is divided up into ten equal parts, each giving their proportion of lift, lift distribution is as sketched in the lower diagrams. Since there is a reduction in pressure over the top surface and an increase in pressure on the lower surface of a wing, air tends to spill round the tips from high to low pressure regions. The effect is much more marked in the case of the low aspect ratio wing, which results in a larger swirl of " mixing " air being generated at the tips. These are called tip vortices and consist of spiralling air streaming from the tips. The more powerful the vortices the greater the drag.

Increasing the aspect ratio of the wing, therefore, reduces the strength of the tip vortices, and, therefore, increases the efficiency of the wings. Similar effects can be produced without altering the aspect ratio (Fig. 4). Adding an endplate fin prevents air from spilling round the tip and increases the wing efficiency (*A*). But the fin adds its own extra drag and may also interfere with stability. Tapering the wing reduces the tip chord and again the strength of the tip vortex (*B*), as does washout (*C*). Both these methods have the effect of slimming out the lift distribution towards the tip, and thus reducing losses. An elliptic wing has a good lift distribution to start with, tapering right off towards the tips and so is the best shape of all in this respect. Almost identical results are obtained from a straight tapered wing with elliptic tips.

The tip vortex or induced drag is dependent on the amount of lift the wing is generating. This is obvious since the greater the lift the greater the pressure difference below and above the wing, and vice versa. Thus aspect ratio is more important on wings designed to generate high lift, i.e., operate at high angles of attack, than on wings for fast aircraft which fly at a low angle of attack. Another " lift " effect—not so important on models—is that the lower the aspect ratio the greater the *geometric* angle of incidence required to generate the same amount of lift. Aspect ratio effects are independent of the aerofoil section, but to compare aerofoil data it is essential to correct to the *same* aspect ratio.

Against a high aspect ratio is the fact that such wings generally work out heavier on models, or tend to be too flimsy to stand up to hard landings. Also for a given *area*, a high aspect ratio means a small chord and a more inefficient aerofoil *section*. Low aspect ratio wings are improved by good tip shapes, perhaps also incorporating washout.

For duration model wings, average aspect ratio figures are from 6 : 1 to 8 : 1. You can go up to 10 : 1 quite safely by introducing taper, but above that expect structural troubles. Tailplanes do not usually have to operate at high lift conditions and so can be low aspect ratio. With large, lifting tailplanes, increasing the aspect ratio can show marked improvements.

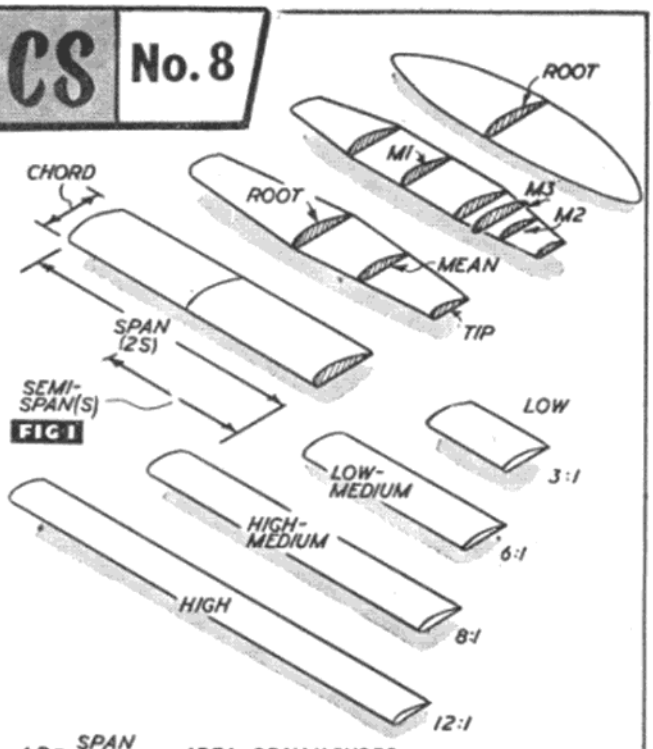


FIG 1

FIG 2

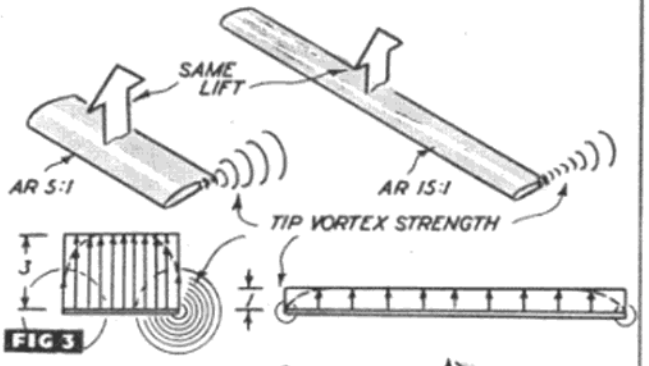


FIG 3

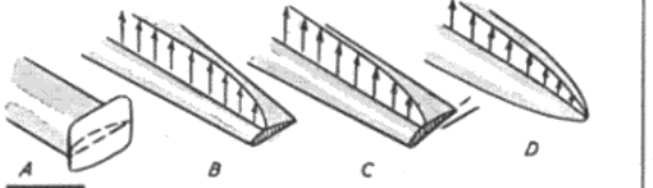


FIG 4

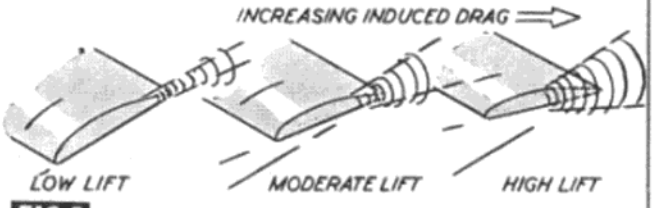


FIG 5

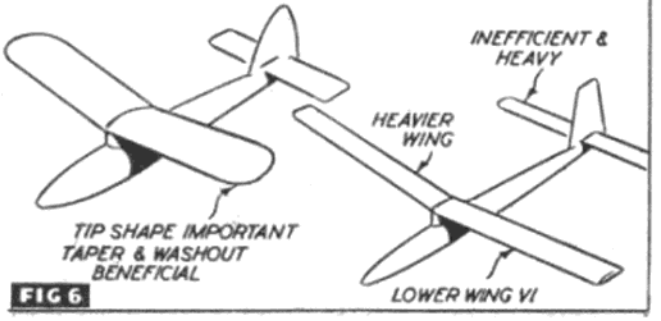
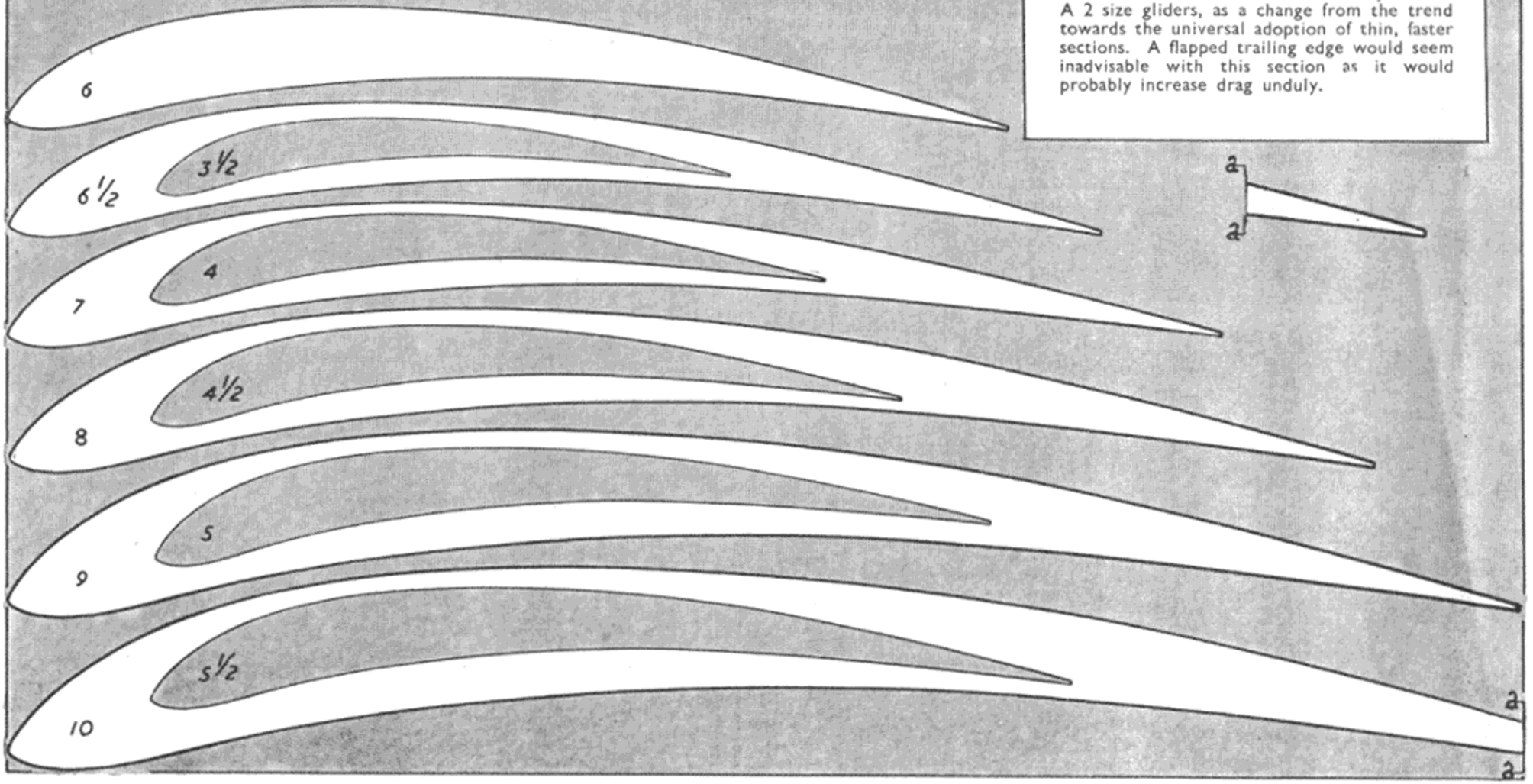


FIG 6

STATION	0	2·5	5	10	20	30	40	50	60	70	80	90	100
UPPER	1·0	4·3	6·2	8·9	11·5	12·2	11·8	10·7	9·1	7·1	5·0	2·7	·3
LOWER	1·0	0·0	·23	1·15	3·3	4·6	4·9	4·8	4·3	3·5	2·4	1·25	0·0

BENEDEK 8358b

This is one of the thicker high-lift Benedek sections with generous undercamber. It should give excellent results on slow-flying models and the depth of section enables a really strong mainspar to be incorporated. Although specified for larger, more heavily loaded models, the B 8358b would seem worth a try out on A 2 size gliders, as a change from the trend towards the universal adoption of thin, faster sections. A flapped trailing edge would seem inadvisable with this section as it would probably increase drag unduly.



Club News

AND NEWS FROM THE S.M.A.E.

CROYDON & D.M.A.C.

The boys turned up in force at the Nationals; the rich half occupied half of Ely, while the hardier types camped and enjoyed the calm early morning trimming weather, instead of feather beds.

Only successes were Jack North, who was first in the M.A. Trophy for the second year running with three 4's and 9:14, and Ed. Bennett, who placed second with 8:54 in the fly-off; flying a Wakefield and a 300 respectively, Jack is still looking for his model.

The Butcher-Cameron-Martin team reached the semi-finals in the class "B" team race, but couldn't quite make the finals. However, for a stock Eta 29, they're quite satisfied; there is now some talk of combat as a relaxation from circle burning.

The boys have compiled a list of gripes and back-pats after the Nats. We did not like: coming back to the airfield with a model, after a chase, only to be bombarded by small Boy Scouts and assorted programme sellers who wanted us to pay to get in; the club that rolled up in a coach at 12.30 a.m. on the Sunday and started singing and hammering tent pegs till the small hours; the people who let off fireworks nearly all night long; the lack of litter bins; the positioning of the power control halfway down the runway. We did like: cold drinks from the mobile canteen; the weather on Monday. Suggestion for next year: Combat ?

The week after the Nationals, the lads made a sudden unanimous decision not to fly in any more rounds of the L.D.I.C.C. knock-out. This was primarily due to their being beaten by 1:20 by West Middlesex in the first round, at Chobham. No excuses, but maybe the Wakefield and A/2 trials had something to do with it ?

KIRKCALDY M.A.C.

The Kirkcaldy Club will be running the Scottish National Control-Line meeting on behalf of the Scottish Aero Modellers Association on September 11th, 1955, at Kirkcaldy. Further details will be intimated later, but events will include stunt, combat team races, A and B, concours and a Jetex 50 flying scale, F/F event.

BRIGHTON DISTRICT M.A.C.

In his final trimming for the Nationals, Alan Mussell found to his cost that 16 oz. of dead-weight makes PAA-loaders very vulnerable; after quite a mild prang even the dummy and cargo had disintegrated as well as the fuselage. However, his new Mach 1-powered F.A.I. jobs (two of which he designed, built and flew within 14 days) showed more than considerable promise. A McCoy 29 version is now on the way.

Seven members made the annual trek to Cambridge and apart from Ian Lucas' second place in PAA-load, luck was generally not on our side. Incidently, Ian's *Crowbar* competing in its fifth PAA-load has now placed second, third, fourth, eighth and second in successive years, collecting three awards.

Sack cloth and ashes department: In last month's report please read Brothers Boxall placed second and third and not first and second in the Area Wakefield eliminator.

MILL HILL & DISTRICT M.A.C.

The F/F boys put up a very good show at Epsom in the first round of the L.D.I.C.C.C. (C.C. ?) against Chingford, who, although they rolled up in far superior transport, went away a little chastened.

Talking of transport, we hired a Bedford Dormobile for the Nats, and succeeded in carrying eleven lads at a time in reasonable comfort at 6s. 6d. per head return, no extra charge for model boxes.

No prizes were picked up here, but we wonder if anyone has seen a red wing, white fuselage, pylon job 60 in. long × 60 in. span anywhere in the district ? It carries the name and address of the owners, but he's still moaning about it, and news of his 2.46 would encourage him no end.

Recently we had a club combat event, won eventually by our Mr. Moore after a final battle with Ken Johnson lasting no less than an hour and a half. Models were a *Monitor* and a *Nig Nog*, (Club design by Comp. Sec.) 2.46's on 60-ft. lines, five min. periods.

HALIFAX M.A.C.

In the area eliminators members of the Halifax M.A.C. put up quite a creditable performance and the times were as follows:

A/2 Nordic (S.M.A.E. Cup), April 3rd at R.A.F., Rufforth. M. Sucksmith, 9 : 39; E. North, 7 : 53; J. Masgon, 6 : 43; A. Nobbs, 5 : 36; G. Shackleton, 4 : 50. Wakefield (Weston Cup), April 24th, also at Ruffnorth. A. Nobbs, 12 : 35; E. North, 13 : 52; K. Grant 9 : 26; H. Hirst, 9 : 13; K. Attiwell, 9 : 23.

In the Northern Area knock-out cup the Halifax team beat the Leeds team in a gale on Baildon Moor.

The times were: K. Attiwell, 3 : 47 (rubber); G. Wright, 3 : 47 (power); E. North, 2 : 23 (glider). Total 9 min. 57 sec. Leeds total, 6 min. 6 sec.

On Sunday, members went to the Huddersfield Club's Rally at David Brown Airfield.

ROUND the RALLIES

THE NORTHERN GALA

Gala to be held at Croft Airport, Darlington, on one day only, Sunday July 31st. See contest calendar for events.

The I.R.C.M.S. Radio Controlled Model Aircraft Competition is to be held in conjunction with this meeting.

Pre-entry to S.M.A.E. Competition Secretary. Entry on field at double fee. All S.M.A.E. competitive members will be liable to be called upon for timekeeping duties. Main Control and Enquiry Desk will be situated near to main gate. Lost models, subsequently recovered, will be handed in to main control. There will be three classes of lapel badge prizes in addition to monetary prizes as decided by the S.M.A.E.

Admission by programme; car park, refreshments, etc. Camping at 2s. 6d. per tent.

I.R.C.M.S. ANNUAL MEETING

Copies of the rules and entry form (S.A.E. please) are available from: D. W. Aldridge, Hon. Contest Publicity Secretary, 1, Fowberry Crescent, Fenham, Newcastle upon Tyne, 4.

The aircraft competitions have not been altered in details, but we are to give a special prize for the best performance put up by a model with single channel control.

Entry forms should be returned to the I.R.C.M.S. Tyneside Group Contest Secretary: Mr. A. S. Wilson, "Cragside," Fatfield, Washington, Co. Durham.

CROYDON GALA

The new date for the Croydon Gala is August 14th; venue is Chobham Common and contests will include open rubber, open glider and open power events, as well as chuck glider and slope soaring.

HYDE, CHESHIRE RALLY

We will be holding a rally on August 14th and the events to be held are:—open power (engine run 15 sec., 3 min. max.), open glider (4 min. max.) open rubber (3 min. max.), Class "A" and "B" team racing, R/C and scale (qualifying flight 60 sec.). Flying commences 10.30 a.m.

Pre-entry fees (2s. snr. and 1s. 6d. jnr.) should be sent to R. Wilson, 21, Harding St., Hyde, Cheshire, not later than August 12th; in return contestants will receive a card permitting entry to the field. Late entry fees, 2s. 6d. snr. and jnr. Non-contestants admission charge, adults 1s. and children 9d. Cash prizes for all events—except scale, dependant on entry. Electric train service from Victoria Station, Manchester to Newton, Hyde.

SCOTTISH P.A.A. RALLY

The contest programme, for which there are over £100 worth of prizes, for Saturday, September 17th, is: PAA-Load International Class/America Class/Rubber- Combat "A" and "B"—Jetex—Team Race Class "B"—Demonstration of PAA Load C/L Endurance. For Sunday 18th, Open F/F Rubber/Power/Glider—Radio Control—Team Racing F.A.I.—Super Scale Event—U.K. Challenge Match.

The rules for the rubber powered PAA-Load competition which will be on Saturday are:—total area not to exceed 200 sq. in.; model weight ready to fly, without dummy occupant 3½ oz.; propeller diameter 12 in.; distance between prop hub and rear motor peg 20 in.; weight of pilot 1½ oz.; fixed undercarriage; no gears or folding props. Intending entrants should check the full rules with a PAA-Load booklet obtainable from the Contest Secretary: 116, Banner Road, Glasgow, W.3, in return for a 9 in. by 6 in. 1½d. stamped envelope

Applications for the special train, detailed in our Marsh issue, should be made to the Festival Manager, 13, Patmore Road, Sheffield 5, accompanied by a P.O. for 1s. for seat reservation. A 1½d. stamped envelope to the Festival Manager will bring an accommodation list for Ayr or Prestwick.

1955 ALL BRITAIN RALLY

Since Messrs. Wilmot, Mansour have decided not to run a Jetex International Contest this year, the Rally organisers have added a *new Jetex contest* for 1955. This will be a duration contest with similar rules, and prizes identical, to those of the other F/F events. Other contest modifications are as follows:

Radio Control—now split into two sections, with separate prizes. Multi-channel will fly the same schedule as at last year's Rally; single-channel will fly the simpler S.M.A.E. Trophy schedule as set out in the new rule book.

Clipper Cargo—motor size reduced to 1 c.c., otherwise rules are as before (as set out in the PAA Handbook).

C/L Team Race—rules as set out in the S.M.A.E. Rule Book for Classes "A" and "B"; NOT as rumoured in some quarters, to F.A.I. rules.

As in 1954, there will be pre-entry for both Team Races. Entries, accompanied by 2s. 6d. entry fee, must be received not later than Monday, August 29th, and must include: competitor's name, address, club, class entered and S.M.A.E. membership number, or other proof of insurance. Heats will be allocated *in advance* on a basis of 15 min. per heat, and racecards will be sent to all competitors to arrive not later than September 19th. These times will be strictly adhered to and contestants coming long distances should therefore notify their expected time of arrival.

If there are vacancies in any heats, entries will be accepted on the field at 5s.

Comprehensive prize list of over 80 prizes exceeding £100 total.

AEROBODS OF NOTE

RAY MONKS

Interested in all types of contest models except R/C and C/L. Top man in British A/2 team 1951. Added to his laurels by winning P.A.A. Load Contest, British Nationals, 1955.

BRADFORD AND LEEDS M.A.C.

We had a howling gale for the Hamley, and only six flew—none of which made all three flights. The times speak for themselves—Brian Eggleston being highest placed with 5 : 35, mainly due to one near-max. when visibility was good, and to his seemingly endless stamina in covering fantastic distances in pursuit of the model ! And second, J. A. B. Pannett with 2.55, flying a *Swiss Miss*. In a club open glider contest the same day, Ken Rutter placed first with 3 : 06 !

In the N. Area knock-out, Bradford and Leeds are still regarded as separate clubs; and by contrast, when Bradford flew against Brighouse, conditions were glorious. With one exception, everybody scored a max. in the first round, but in the second the Bradford " reserve team " of Lees, Collinson and Eckersley crept ahead and the contest ended with a comfortable win for Bradford by 5 : 40.

The club held an open power and A/2 contest, also in ideal weather. Winner in power as A. Collinson's latest Super Tigre power *Creep* with 10 : 40, and second an Oliver Tiger version by P. Barnes of Leeds with 10 : 00. Junior J. Northrop beat J. A. B. Pannett to third place by 1 sec., flying a *Mini-Creep* with Elfin 1.49 and scoring 6 : 56. Pannett's *Swiss Miss* hit some H.T. wires after his second flight, and he spent the remainder of the day rebuilding the tailplane in order to make a third flight.

In the A/2, top man, with 12 : 48, was new member K. Pickles, and second, L. Hey with 10 : 28—but there were only three entries all told !

ANGUS AND DISTRICT A.L.

The club held the second pair of 1955 comps. at H.M.S. *Condor*, Arbroath, in ideal weather. Events were open scale and open rubber duration. Montrose team won them both, although W. D. Guild of Dundee placed first in the scale event. D. D. Edward, pioneer of the league and long-established model designer, attempted to make a come-back with a new o.d. rubber job with double folders. But Whyte and Campbell of Montrose were reaping the benefits of three year's careful research in Wakefields, and, hooking more updraughts than the smaller models, forced D.D.E. into 3rd place much against his will, for is he not the League Secretary? Whyte scored a max. of 3 min. on his first flight but as he had miscalculated fuse-length, the Montrose H/L record was promptly broken with a flight of 9 min. o.o.s. After miraculously being able to find and retrieve the model from the hinterland he returned to complete two more good flights and to win the event by 14 sec. over Campbell, who had squandered his chances in a glorious power-stall in the first round.

Junior W. Petrie of Montrose, 14 years of age, flying a brand new rubber job he built following suggestions made by the Seniors, did 2 min. 55 sec. in the first round, but lost his chance with a motor breakage in the second round.

Fouth place was taken by D. L. Petrie Montrose, with his M.A. *Upstairs Maid*.

Nest year we intend to run a competition for A1 class gliders.

READING A.A.C.

Recently the Reading Association of Aeronautical Clubs held their first joint visit when calling at Blachbushe Airport. The day's programme was divided into three separate tours of the air-line companies occupying this 'drome, and responsibility for the arrangements was shared by the Reading Solid-Model Society (senior club of the group, and the Ashmead S.M.S. The other clubs represented were Woodley Hill S.M.S., Emmer Green M.A.C. and the Reading Kayakists.

In all cases excellent guides were provided by Eagle Aviation, Silver City and Airwork Ltd., and for all the visitors this was a very memorable day.

Following a close inspection of *Dakotas*, *Vikings*, *Lancasters*, *Gemini* and *Hermes* at Eagle Aviation, the clubs started on their policy of getting members into the air. For years past it has been the ambition of the group to introduce all members to flying, but costs have been prohibitive. Through generous co-operation on the part of the Aviation Company, 20 members enjoyed half-an-hour of flying in a *Dakota*. During this trip the pilots explained the functions of the controls to the junior members. Already plans are being made for future flights and as this side of club activities flourish it is intended to use aircraft for short haul trips to air shows on charter.

At Silver City an outstanding aircraft was the Bristol *Freighter* and at least one member spent the whole tour in the cockpit drawing the details for a coming model—authenticity being essential in the local contests. In addition to being shown through the aircraft, the guide then explained the principle involved in flight servicing, then taking the whole party of 47 visitors to the control tower, met. room, customs and restaurant.

The final stage was at Airwork. Here there was no need of a guide as members were trusted to carry out their own studies. Such faith in the commonsense of youthful enthusiasts is very pleasing to club officials. The aircraft available were a *Hermes* 4, fitted for troop transporting, a *Valetta*, *Proctor*, *Viking* and *Consul*.

FORESTERS (NOTTINGHAM) M.F.C.

The Foresters experienced atrocious luck at the Nationals. Ken Oliver ran halfway round Waterbeach with his A/2 atop of the line, trying to contact the elusive lift; he eventually sank exhausted to the ground and his glider clocked 50 sec. ! Other models which normally clock 3 or more minutes were recording as low as 20 sec. Tom Woodward, flying his Pilcher cup winner, fared no better; but in the Rubber, he eventually " copped " the elusive lift, only to see his D. Td. Wakefield pass out of sight, still going up.

The team-race boys had left three high aspect ratio planes at home in view of the circulated rules, only to see such planes competing and being told, " Oh, the S.M.A.E. Council decided not to enforce the new rules, didn't you know ? The London clubs knew." ! ! ! One Foresters class " A " literally exploded in mid-air when a slight split developed in the leading edge of one wing, the plane splitting like a banana skin at 85 m.p.h. The best model shot its lines and finished up under " Stoo " (Thin Man) Steward's Riley. It was being clocked at a consistent 92 m.p.h. (the class " A " job, not the Riley !). This plane was hurriedly repaired, with a 50 sq. in. piece of timber for a wing, and entered in the speed, but lo, the speed was down to 80 m.p.h. with the smaller wing ! This was most annoying as the 2.5 speed was won at only about 90 m.p.h. A third " A " model, with an Elfin 2.49 B.R. aboard, hit a parked car one side of the runway whilst trying to avoid a moving car the other. Eventually, 2 models got through to the semi-finals, only to have some farm oaf knock one of the metal stanchions holding the ropes straight across one wing, whilst the plane was in the line-checking enclosure. Now there was one. This reached the final, only to be involved in a line tangle, involving reeling out a new set of lines. The result was that we placed third, 6 laps behind the winner. We were then told by the umpire, " Good job you didn't win, you would have been disqualified ! " Typical.

Not a Foresters' day.

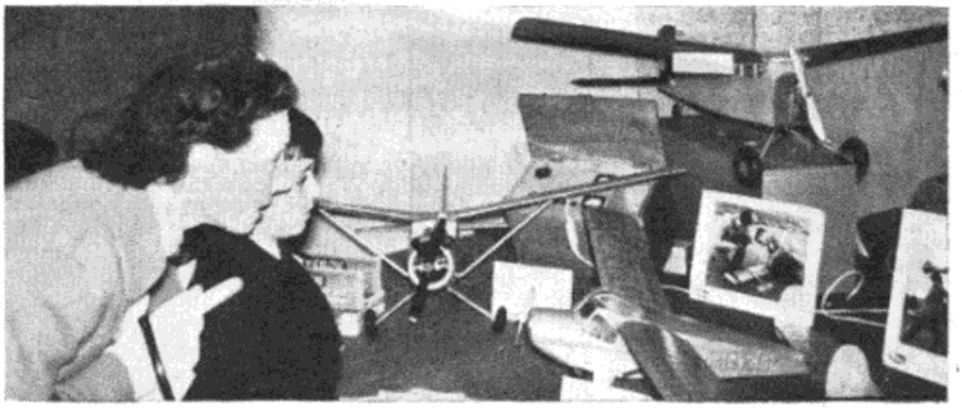
NORTHWICK PARK M.A.C.

Recently the club took part in an exhibition at Wembley Town Hall to raise funds for Old Folks Homes. A variety of models were shown ranging from gliders to R/C planes including a boat to illustrate the " works." Photographs were kindly loaned by MODEL AIRCRAFT. A *Hawker Hunter* was raffled, which realised £5 5s. towards the funds.

Twenty-five members of the club camped out at the Nationals, a motor coach having been hired for the journey. Entries were made in rubber, glider, power and scale events, junior Pete Babb flying well in the scale, coming sixth with his *Nord* NC.853, and George Upson taking third place in the Model Aircraft Trophy.

Examinations are now interfering with construction, but plans are being made for more activity in this direction during the holidays.

An interesting flying scale model of the Sopwith Camel. Fitted with 3-channel radio and spanning 78 in., it has been built by R. A. Chivrall, P.R.O. of the Crystal Palace M.A.C.



A corner of the exhibition given by the Northwick Park M.A.C. at Wembley Town Hall in aid of the Old Folks Home Fund.

HATFIELD FIDDLERS (M.A.C.)

The Nationals were attended by eight members. D. Benson kindly took all the necessary camping equipment by car, and the rest followed by bike. K. Hastings placed 7th in the glider, D. Benson and J. Fox 3rd and 5th respectively in R/C on first day, J. Fox 4th on second day (D. Benson did not place as he lost his model). C. Sykes placed 8th in the Lady Shelley with his first flying wing, which was his own design; after his comp. flights he broke the club record with 5 min. 20 sec. and the following week, at the club field, had the pleasure of seeing the same model disappear over the horizon. D. Benson, who believes in going in for R/C in a big way, is proposing to use a 6 reed outfit, as he evidently finds his 3 reed too tame.

GLEVUM (GLOUCESTER) M.F.C.

This year the club is again under the secretaryship of J. Roles, one of the founder-members from when our model flying was done from a very small field.

The club has three cups to fly for in F/F now that we have a F/F venue again (Chedworth).

Another new feature for us is indoor flying round the pole, and at our first meeting the rubber winner in points and duration was R. Limbrick; second in points flying was J. Ralph, with D. Bolton third. Two records were set up by D. Bolton with a Jetex "50" on a 5 ft. 6 in. line length. First with a speed of 35 m.p.h.; second in clearing the hall in 2 sec. when the "missile" got going.

The hall has been booked again for indoor flying from August, 1955, onwards; just right for when our "Madam Butterfly" summer ends outdoor flying.

A C/L contest has been arranged with our near neighbours the Cheltenham club, for September this year; "A," "B" and "C" racing up to present, so there is plenty of building time, etc. (S.M.A.E. rules will apply).

Any members, friends, or relations or anyone outside of the club will be welcome to join us on our coach outings to flying meetings, and other modellers about the city can contact us through "Fletchers" of Kings Square.

NORWICH M.A.C.

Record-breaking member of the club is J. Engall, who broke three records at one go at the Nationals. His *Iota* on 13 sec. engine run did 4 min. 52 sec. o.o.s. (His model is still missing, and if anyone finds it would they kindly notify MODEL AIRCRAFT or the owner).

Over 20 members turned up at the Nationals with the intention of flying in most of the contest, but the majority were so oppressed by the heat that they couldn't move their weary limbs to find the centre for the contest.

The monthly cup was won by C. Moody with a R/C R.6.B. which was most authentically decorated, G. Davie's 11 ft. *Thermalist* which he was testing recently for an attempt at the world record R/C duration, picked up a thermal and disappeared into the fringes of a cloud. This model, which he has greatly modified, will take, he hopes, with the aid of a 3.5. or 5 c.c. engine on top, its 12 lb. weight.

The club P.R.O. would like to know of any model club in the N. Berwick area of Scotland, who will be holding a club meeting between the 16th and 30th of August as he is on holiday there and wants to compare modelling views with members north of the border. Name and address is: G. Davie, 7, Davidson Road, Thorpe, Norwich, Norfolk.

ENFIELD AND DISTRICT M.A.C.

A large contingent attended the Nationals, but without success. Amusing (?) but very expensive incidents were: the junior who forgot to put any oil in his fuel ("Have you got any idea why these two engines have seized up?"); and Mr. Walker's "B" racer, which, although previously reliable, wrecked no less than four plugs, four sets of lines and five props. in practice, then went perfectly in the heat until, while leading at the last stop, it turned in, and yet another set of lines went round the shaft.

CHEADLE AND DISTRICT M.A.S.

Various means of transport, including a coach, took the Cheadle M.A.S. down to the Cambridge "brawl," where those more hardy members camped but didn't sleep.

Glider day proved "typical" in the number of down draughts caught; gliding it seems is becoming more and more like fishing. Our sole entry in PAA-load suffered two motor over-runs and a broken tail in the newly-erected jet pens.

Monday saw Ian Harrison sharp off the mark as the first entry in the Shelly at 10.0 a.m. By 11.15 a.m. Ian had collected a healthy 11 min. 14 sec. for third place with his Oliver cub model, the rest of the day was spent in time-keeping and watching the other results.

There is a considerable amount of feeling in the club about the venue of National contests: the recent Ripmax radio contest and the trials at Odiham are hardly fair to Northerners, and means travelling a matter of seven hours each way; rather a different story for the London area who can do the journey in an hour or so.

Tuesday evening club nights are held at the 284 A.T.C. squadron H.Q. in Bank Street, and new members, especially competition enthusiasts, are welcome to come down and join the gang.

Back from three years in the R.A.F. we are pleased to welcome Gerry Brimslow and Gordon Seymour into the club again; after a period of depression due to call up, the club is once more growing in numbers and enthusiasm!

Members have use of a very good flying field in Cheadle. Unfortunately it is fairly close to a housing estate and so the C/L boys have sportingly agreed to use another nearby site to reduce the noise element.

CRYSTAL PALACE M.A.C.

Having been bitten by the radio bug, several members have plunged into the intricacies of R/C, backed up by sympathetic club mates, who secretly hope to witness a flight that is really controlled, before embarking on a similar project themselves.

Peter Bragg, being the first on the field with a *Skyscooter* and E.C.C. equipment, has learnt a few wrinkles on fuselage strength versus gravity, and has since made a more robust job, ready for further exploits.

The combined effort of John Rogers and Fred Moore should show up at any moment, having undergone bench tests for radio reliability.

Another enterprising member, the P.R.O., has brought to light a 6 ft. 6 in. span scale job; the product of six months toil, fitted with a 3-channel set, and Miles Special engine. Weighing 7¼ lb., it successfuly passed gliding and undercarriage strength tests at Waterbeach, and shows great promise.

CONTEST CALENDAR

July 22/24th	**International Meeting.**	Jami Jarvi, Finland. Rubber, A2 & Class D Power.
,, 31st	**INT. R/C CONTEST.**	To be held at Northern Gala.
July 31st & Aug. 1st	**NORTHERN GALA.**	Centralised. ‡Croft Airport.
	C.M.A. CUP.	Glider.
	FROG SENIOR CUP.	Power.
	FLIGHT CUP.	Rubber.
	TEAM RACE.	F.A.I. 2.5 c.c.
	TEAM RACE.	Class "B."
	C/L SPEED.	All Classes.
	PAA-Load.	1 c.c.
Aug. 1st	**Chester C/L Rally.**	Roodee, Chester.
,, 6th	**R.A.F. Championships,**	Horsham St. Faith, Norfolk.
,, 14th	**Croydon Gala.**	Chobham Common Unr. Rubber, Glider & Power.
,, 14th	**Hyde M.A.C. Rally,**	Newton, Hyde, Cheshire.
,, 15/16th	**Stella d'Italia Cup.**	Trentino, Italy, Gliders (slope soaring).
,, 14/21st	**Nat. Meeting with Int. Contests,**	Yugoslavia.
,, 21st	**South Mildand Area Rally.**	Cranfield, Beds.
Sept. 3/4th and 5th	**WORLD CHAMPS.**	Wakefield, Power & A2 Gliders. Finthen, Germany.
,, 11th	**C. H. Roberts Cup.**	Blackheath, London, S.E.3. Rubber powered flying boats.
,, 11th	**Scottish C/L Rally,**	Kirkcaldy.
,, 17/18th	**U.K. CHALLENGE MATCH.**	Heathfield, Prestwick. In conjunction with **Scottish PAA Rally.**
,, 25th	**All Brit. Rally.**	Radlett, Herts.
Oct. 2nd	***MODEL ENGINEER CUP.**	Area. Team Glider.
	GUTTERIDGE TROPHY.	1st 1956 Wakefield Elim.
,, 2nd	**6th Criterium d'Europe.**	C/L speed 2.5 c.c. & supporting events. Brussels.
,, 16th	**AREA K.M.A.A. CUP.**	1st 1956 Glider Elim.
	HALFAX TROPHY.	1st 1956 Power Elim.
,, 16th	**Int. C/L Speed.**	Aerobatic & Team Racing. Monaco.

*Plugge Cup Event.
‡Provisional Venue.
S.M.A.E. CONTESTS IN CAPITALS

PETERBOROUGH M.A.C.

Peterborough M.A.C. club members were pleasantly "browned off" during Nationals weekend. An Eliminator and an *Inchworm* were lost, the latter on A. Ginn's first contest max. This member actually defied the weather by getting flu! All members enjoyed an informative time, being the first contest entered by some. The club received a generous write-up in the local paper, giving full history of the club which dates back to 1938, and some of the original members are still enthusiasts. Indoor club nights for summer are the first Tuesday in each month at 7.30 p.m.

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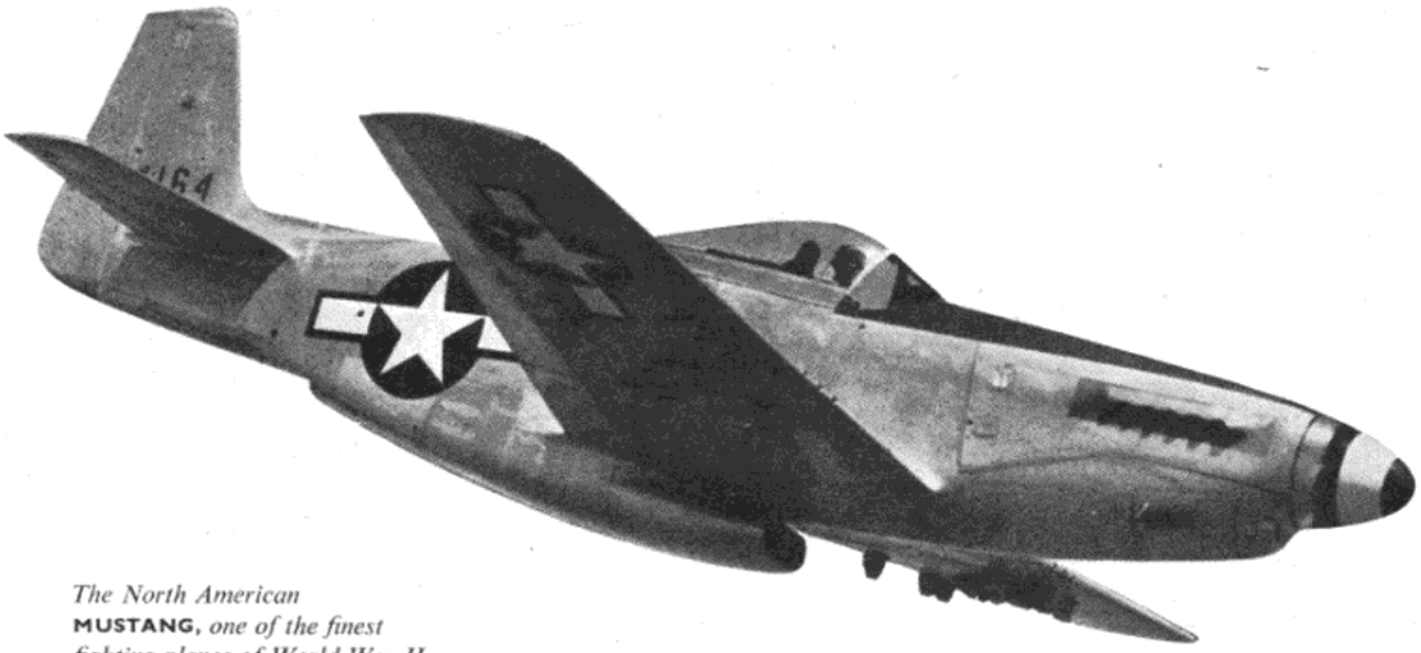

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SMA. 1. Roland Walfische
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SMA. 4. Messerschmitt 109G
SMA. 5. Gloster Bamel
SMA. 6. DHC 2 " Beaver "
SMA. 7. Deperdussin Racer
SMA. 8. Handley Page (R) 2 Trainer
SMA. 9. Macchi-Castoldi MC 72
SMA. 10. Arrow Active II
SMA. 11. Fairey Swordfish
SMA. 12. Percival P 56 Provost
SMA. 13. Fokker F III
SMA. 14. Boulton Paul Balliol
SMA. 15. Sopwith Camel
SMA. 16. S.E. 5A
SMA. 17. Boulton Paul P III
SMA. 18. Prestwick Pioneer
SMA. 19. Heston Phoenix
SMA. 20. Gloster Grebe
SMA. 21. Spirit Of St. Louis
SMA. 22. MIG 15
SMA. 23. Fairey Tipsy Junior
SMA. 24. Supermarine Swift
SMA. 25. Blackburn Lincock III
SMA. 26. Supermarine " Seagull "
SMA. 27. Spitfire Mk. I
SMA. 28. D.H. 60 Moth
SMA. 29. Henry Farman
SMA. 30. Armstrong Whitworth FK 3
SMA. 31. Fairey Fantome
SMA. 32. Bristol 173 Helicopter
SMA. 33. Fokker D VII
SMA. 34. Fairey Fox
SMA. 35. Saab J-29
SMA. 36. Vickers FB 9 Gunbus
SMA. 37. Wright Biplane
SMA. 38. Slingsby Sky Sailplane
SMA. 39. D.H. 9a
SMA. 40. The Westland Wyvern
SMA. 41. The Bleriot Monoplane
SMA. 42. The Messerschmitt ME 109E
SMA. 43. The Blackburn Shark
SMA. 44. The Avro 504K
SMA. 45. The Hawker Seahawk
SMA. 46. The Brandenburgh Seaplane
SMA. 47. The SPAD Berline
SMA. 48. The Lockhead Starfire
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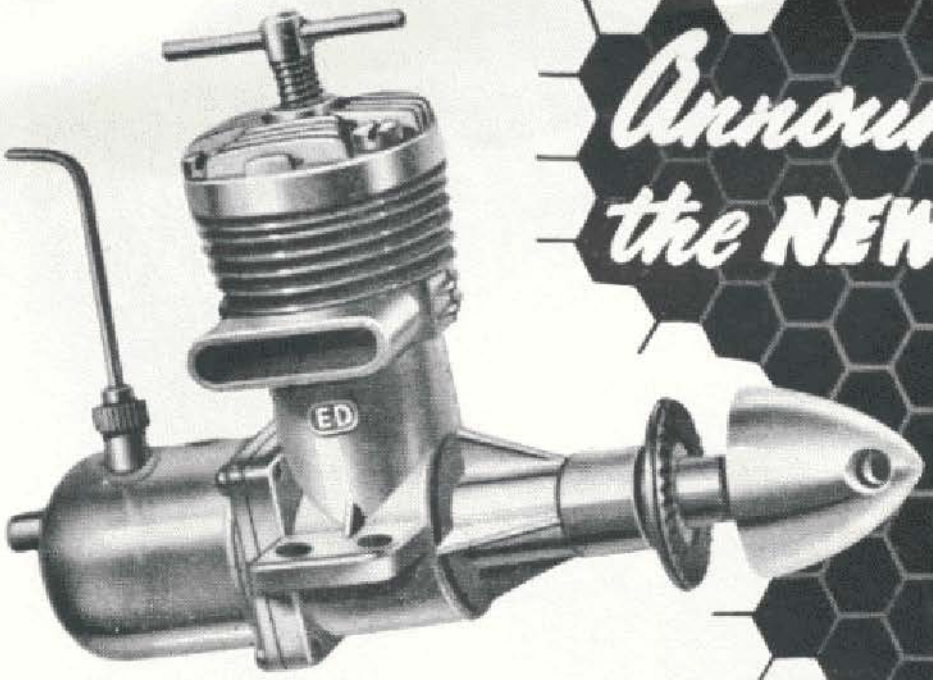

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