MODEL Aircraft

IN THIS ISSUE

DECEMBER 1950

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THE JOURNAL OF THE SOCIETY OF MODEL AERONAUTICAL ENGINEERS

Digital Edition Magazines.

This issue magazine after the initial original scanning, has been digitally processing for better results and lower capacity Pdf file from me.

The plans and the articles that exist within, you can find published at full dimensions to build a model at the following websites.

All Plans and Articles can be found here:

Hlsat Blog Free Plans and Articles.

http://www.rcgroups.com/forums/member.php?u=107085

Digital Edition Magazines.

AeroFred Gallery Free Plans.

http://aerofred.com/index.php

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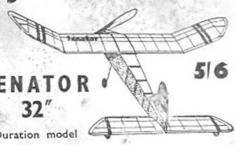

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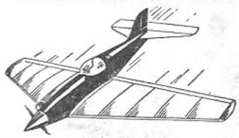

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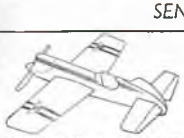

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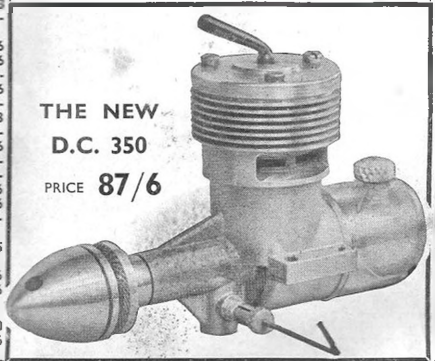

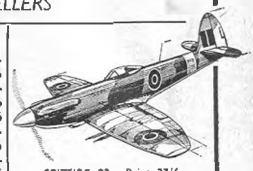

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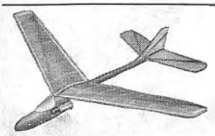

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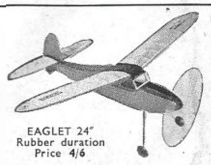

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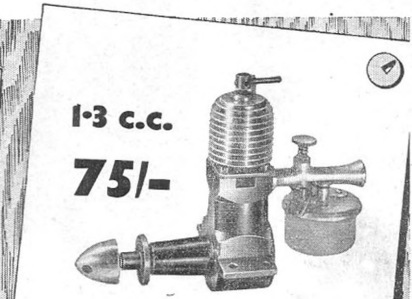

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MODEL Aircraft

THE JOURNAL OF THE SOCIETY OF MODEL AERONAUTICAL ENGINEERS

Editor: E. F. H. COSH

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DECEMBER 1950 VOL. 9 No. 11

Contents

EDITORIAL

Our readers will no doubt be aware that since April, 1948, there has been a certain amount of confusion as to whether or not model aircraft accessories, motors, etc., became chargeable with purchase tax under a new order. This order amended the list of chargeable items to include toys and games, appliances, apparatus, accessories and requisites for sports, games, amusements, etc. . . . including parts thereof and accessories thereto.

Since this order came in force, some manufacturers have included purchase tax in the price of their engines and others have not. The position of accessories, etc., has been largely undecided.

With a view to clarifying the position and in particular to free all model aircraft items from the "toys, games, sports, amusements, etc." classification, the case for the model aircraft trade was taken up by the Federation of Model Aeronautical Manufacturers and Wholesalers, and in order to secure a definite ruling, a Test case was instigated, the defendants (on behalf of the member firms of the Federation) being Messrs. E. Keil & Co., Ltd., with the Commissioners of Customs and Excise as plaintiffs.

There has been considerable, but inevitable delay between agreeing this Test case and bringing it into court. The case was, however, heard in the King's Bench Division of the Law Courts, on October 23rd, 1950, before Mr. Justice Croom-Johnson who ruled that in his interpretation of the law, model aircraft were inseparable from the broad general classification of "toys, games, sports, amusements, etc." as laid down in the order. He also ruled that in view of this, kits and accessories came under the same order as "apparatus, appliances, etc., thereto."

This means in effect that all model aircraft kits, components, accessories and engines are legally subject to purchase tax, the rate of tax being 1/3rd of the wholesale price of the article. What effect this will have on the trade, or what further action the Federation may decide to take is not at present known, but unless it is decided to appeal against the decision, and this appeal is successful, an all round increase in the price of kits, accessories and engines (except those at present already being charged as including purchase tax) appears inevitable.

Cover Story

The successful advent of the first R.A.F. Championships Meeting at Halton on September 24th, 1950 marked a new step forward in aeromodelling in the Services.

Our cover photograph shows one of the contestants, Cpl. N. Barker of R.A.F., Cardington, preparing to fly in the Power event in which he gained second place.

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HERE AND THERE

The Editor Comments on Current Topics

1950 AMERICAN NATIONALS A perusal of the 1950 American National results throws an interesting light on the present speeds prevailing on the other side of the Atlantic and the motors used to attain them.

In their class "A" the McCoy 19 engine completely swept the board at speeds averaging around the 110 m.p.h. mark; the best being 116.84 m.p.h. by Warren Tomme—a junior entry.

Honours in the "B" class were shared out fairly equally between the McCoy 29 and the Dooling 29. Here the average speed was in the region of 120 m.p.h. with the best performers, Torry and Stanley Grish, working as a team, well ahead of all others with over 12 m.p.h. in hand at 137.88 m.p.h.

In class "C" the McCoy 49 established an undisputed superiority with speeds in the neighbourhood of 125 m.p.h. with the best performer, Lew Mahieu, of Long Beach, achieving 135.28 m.p.h.—not so fast as the smaller class.

In the larger "D" class the McCoy 60 and Dooling 61 share the honours at speeds of 140 m.p.h. with world record holder, Eugene Stiles, of Alameda, reaching 147.48 m.p.h. to achieve the highest speed of the meeting.

These speeds compare favourably with those achieved at Knokke by the chief European exponents and give an indication of the goal to be aimed at by our national speed exponents.

It is always difficult to make comparisons between flights made in different countries under different conditions in the case of free-flight models. This applies particularly to flights made in America where we have had frequent evidence that better than average conditions obtain than in this country. Nevertheless it is always useful to know what is happening elsewhere and a review of the free-flight results at the American Nationals, at which there was considerable rain this year, reveals that the standard of winning flights were of a definitely high order by comparison with those to which we are accustomed in this country.

No less than 54 entries with a aggregate of over 10 minutes appear in the results, which is impressive by whatever standards and it indicates no falling off in the quality of American aeromodelling.

The best total of 26 min. 11 sec. was reached by Joseph Foster Jnr., of San Jose, California, with a model powered by an Ohlsson 23, the next best being by Jack Emery, another Californian, with a total of 23 min. 20 sec.

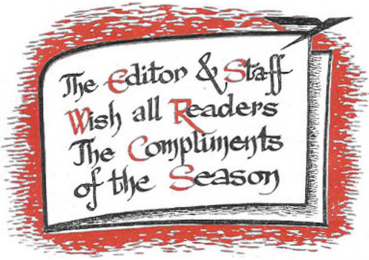
Seventy-two different classes appear in the Nationals results and this must almost be a record in itself.

WAKEFIELD CONTEST 1951 As we go to press we learn that Finnish Aeronautical Association has applied for sanction to hold the 1951 Wakefield Contest in Finland and there seems little doubt that the event will be held once again in the land of the midnight sun. The S.M.A.E. Council have no objection nor it is almost certain will the F.A.I.

In view of the excellence of the arrangements and organisation of the contest held at Jämijärvi those who made the acquaintance of the Finns this year will look forward to another visit with undoubted pleasure.

The S.M.A.E. Council have also approved the modification of the Wakefield Rules on the lines recommended by the F.A.I. Stockholm conference which should give the 1951 contest an added interest.

For the benefit of those who are not yet aware of



these modifications we have given details of them together with a technical review of their implications and effects in this issue.

The main purpose of the modification is to bring the method of measuring the models into line with the international method established some three years ago by the F.A.I. in order to avoid confusion and eliminate certain weaknesses which have caused difficulties of interpretation in the past.

The method of measuring the total area and the fuselage cross section will be in accordance with the F.A.I. regulations, with the area of the surfaces including the projected area of the surfaces through the fuselage, and using the " inscribed circle " method of calculating the fuselage cross section in difficult cases of wing and fuselage junctions. The projected area of the surfaces on to the horizontal plane will also be employed in determining their area.

As the F.A.I. methods of measuring have been fully explained in the S.M.A.E. Handbook for the last two years we would refer our readers to this publication for full details.

THE 1951 WAKEFIELD TEAM

Now that it is known that the 1951 Wakefield Trophy Contest will again be flown in Finland under similar conditions to last year the question of the British team selection is one of paramount importance. There is a likelihood, as we see it, of a repetition of the 1950 results if a team is chosen on the performances in the Wakefield Trials held under typical *English daytime conditions*. We need models with maximum *still air performance* and such models may not necessarily be suited to normal British competition weather. Given a windy Trials day, for example, a model which may well be capable of winning the Wakefield in Finland might well do very badly in the Trials. Maximum still air duration calls for, basically, moderate power and a long power run and rather " open circle " flying. This type of trim seldom pays *in a wind*.

Nor would attempting to hold our Trials under similar conditions to those which might be expected in Finland be the answer—for we very much doubt if we could get similar conditions to order on the date required! We have given the matter very serious thought, and talked it over with a number of leading Wakefield fliers. One solution which, it has been suggested to us, would meet the case and give Great Britain the best possible chance of bringing back the Wakefield to this country is as follows.

The S.M.A.E. should select, now, half of the team members on the understanding that they got down to the job of producing Wakefields *for Finnish conditions*. They would be excused flying in the Trials and could concentrate entirely on still air models. The remaining three places would be filled by Trials competitions to preserve the present attractiveness of " giving everyone a chance of getting into the British Wakefield Team."

The three selected members? Those suggested by the chap who thought up the scheme would, he says, be Evans and Warring of the 1950 team, who would have the invaluable experiences of Jämijarvi contest behind them: and Copland, who is still undoubtedly in the world class of Wakefield fliers. All three, he points out, are experienced Wakefield men and all prefer " still air " conditions.

He adds that Ellilä will almost certainly be improving his model for the 1951 contest, under the conditions in which this contest will be held and suggests that his scheme is the only certain way of preventing a Finnish " hat-trick."

Whilst there is no doubt that this somewhat drastic method of team selection would provide us with a first-class Wakefield Team we doubt whether it would be at all popular with the fliers who will be competing for a place in the British team which will make the journey to Finland. Nor are we satisfied that it *is* so all-important that Great Britain should win the Trophy in 1951—after all, the U.S.A. and ourselves have had our fair share of successes.

We should, of course, be delighted to see the British Team win in 1951, but we must keep in mind that the donor of the Trophy, the late Viscount Wakefield of Hythe, desired above all that it should promote international goodwill and sportsmanship. The fostering of this spirit seems to us to be far more important than which country actually wins the Trophy.

MODEL FLYING BANS

The newly elected P.R.O. of the S.M.A.E., K. J. A. Brookes, intends to endeavour to counter, as far as possible, the recent adverse publicity which our hobby has received as the result of reports in the daily press dealing with the banning of model flying in certain districts.

Despite the amount of space devoted to these reports, we are, of course, aware that the local councils who have taken this drastic action are a very small minority compared with those who have given model flying every support and encouragement.

Mr. Brookes feels, and we entirely agree with him, that more publicity should be given to this fact and asks that the secretaries of clubs who have been able to interest local authorities in their activities, thereby obtaining flying grounds and other facilities, should write to him c/o the S.M.A.E. Offices, Londonderry House, Park Lane, W.1. giving full details.

PURCHASE TAX

IMPORTANT NOTICE

As purchase tax is now chargeable on model aircraft products (see Editorial) the prices quoted by our advertisers in this issue may be subject to alteration without notice.

RED LIGHTNING

BY D. W. ROWE

EARLY this year the designer became extremely interested in team racing. The S.M.A.E. having published their team racing rules, he set out to design a plane which would conform to their specification, and look like the real thing.

The ultimate result was *Red Lightning*, which has a consistent top speed of just on 80 m.p.h., does forty-seven laps on 27 c.c. of fuel (present tank capacity) and has an all up weight, less fuel, of 18 oz. It has already won one team race event at the West Essex Gala, and came third in the All Herts Rally, owing to a slice of bad luck when a piece of solder from the tank stopped up the jet, when half way through the finals.

Construction

Fuselage—Cut the fuselage formers to shape. Use $\frac{1}{8}$-in. ply for No. 1 and hard sheet balsa for No. 2, the remainder from medium hard sheet. Notch formers 6, 7 and 8 to take the rudder. Use hard wood for the engine bearers.

Cut out the $\frac{1}{8}$-in. sheet sides as marked on the plan from medium hard balsa.

Make a template of the wing section at the root, so that the recesses for the wing in fuselage sides will be exactly the same when cut out.

Bend and fit 10-gauge wire for undercarriage to No. 1 ply former. This is done by sandwiching the undercarriage wire to the former as shown in the plan.

Next fit engine bearers to formers 1 and 2, use glue here. When they are dry fit engine and bolt it to the bearers. Remove engine and solder a piece of brass strip across heads of each pair of engine bolts, to prevent them from turning.

Fit the 1 oz. tank as shown in plan. Drill a hole through No. 1 former for the feed pipe, which should project $\frac{1}{4}$ in. though, and be in line with the jet. If fitted carefully it will clear the engine crank case.

Wedge the tank securely between formers 1 and 2 with scrap balsa and cement.

Next cement the fuselage sides on to formers 1 and 2, making sure they are parallel, when dry fit soft balsa wedges between sides of tank and fuselage. Cement in position formers 3 to 8 and joint the ends by fitting a small triangular piece of hard balsa in between, as shown on plan.

Make rudder with two pieces of $\frac{1}{8}$ in. balsa, grain running as shown on plan, cut and sand to streamline section and cement in position, then plank in the top half of the fuselage from formers 1 to 8.

Build up top half of the cowl with $\frac{1}{4}$ in. $\times$ $\frac{1}{2}$ in. sq. soft balsa and cut roughly to shape.

Tail—Cut out tail from hard $\frac{1}{4}$ in. sheet, sand to streamline shape. Elevator is hinged on with binding tape. Next fit control horn.

Wing—Cement two sheets of $\frac{1}{16}$ in. hard balsa edge to edge. Sand both sides flat, as this will help to make a good job of the wing. Trace full outline of wing on to the sheet. Cut out to shape and mark on position of ribs and pin on to flat board.

Cut out ribs from hard $\frac{1}{16}$ in. sheet making the necessary slots in the port ribs. Drill $\frac{1}{16}$ in. holes in the outer rib and insert in each a piece of 20-gauge inside diameter aluminium tube. Cement ribs in position and leave to dry.

Cut out wing tips ready to cement in position.

Cement approximately $\frac{1}{2}$ oz. of lead to inside of outer starboard rib.

Thread control wires through slots in ribs to make sure they are an easy sliding fit.

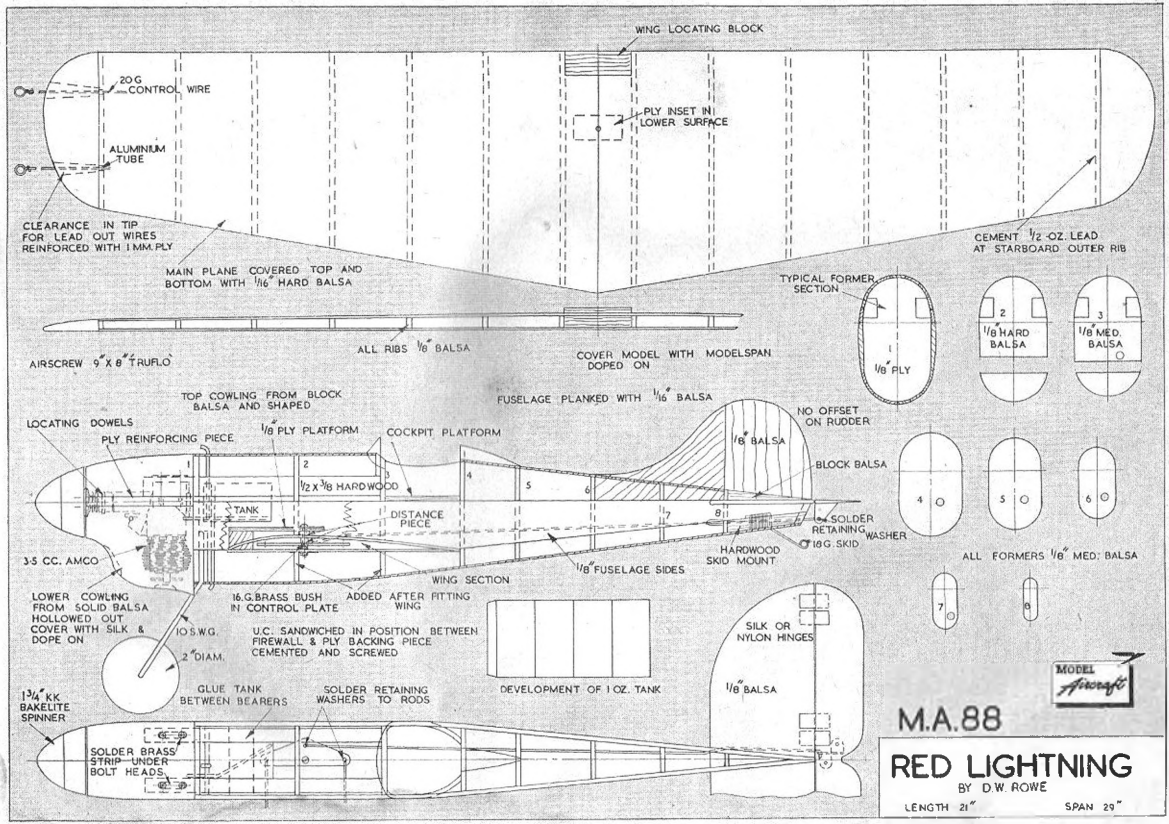
Make control plate as per plan. For the pivot on the control plate use a 16-gauge brass bush, cut to length so that when fitted to plate and nut screwed up tight bush is flush with nut. To lock nut cement round the edges. The same method is used for fixing push and pull rod to the control plate, and control plate platform. Spacing washers can be cut from the remainder of the 16-gauge bushes used.

Bend control rod to shape and fit to control plate, do not fix.

Fit 20-gauge control wires to plate, use brass or aluminium tube to bush control wire holes, solder ends.

Thread control wires through ribs, and let the control plate rest between centre ribs when sheeting the wing is in progress.

Cut two pieces $\frac{1}{16}$ $\times$ 3 in. medium balsa for sheeting forward half of port and starboard wing. Cut to length from outside rib to inside of centre



FULL SIZE WORKING DRAWINGS ARE OBTAINABLE FROM YOUR LOCAL DEALER, OR BY POST FROM THE "MODEL AIRCRAFT" PLANS DEPARTMENT 23, GREAT QUEEN ST., LONDON, W.C.2. 5s. 0d., POST FREE

ribs for both sides, also cut out wing locating block.

Before cementing front half of wing sheeting damp top surface and bevel leading edge underneath, cement in position using pins to hold the sheet down.

Cut out rear half of wing sheeting in one piece. It will be noticed that the rear edge of the front sheet is not straight. The reason for this is that the wing section gets thinner towards the tips. Trim away the front edge of the rear wing sheeting until a flush fit is obtained, bevel slightly under T.E., to ensure a good joint. Cement in position and pin down. Add wing tip blocks and carve to section.

It is very important that the passage way for the control wires on the port wing be opened out at the tip. Let in two pieces of 1 mm. ply to cover control wires. There is a good reason for doing this, the vibration set up by the engine, if movement is restricted, will cause control wires to harden and snap off close to the wing tip. So be warned! The suggested method obviates the trouble.

When wing is dry remove from board and sand to required shape.

Cement wing locating block in position, and place control plate platform in position and pass $\frac{1}{16}$ in. drill through bush, control plate bush and drill through wing and ply reinforcement which has been cemented underneath. Make sure your control wires are long enough to enable you to slide out control plate without losing the ends. Fit push and pull rod to the plate, solder washer over end and file nearly flush. Push control plate back into position. Pass a piece of 16-gauge wire through control plate platform bush, control plate and wing, adding necessary washers for correct spacing. Solder a washer to both ends of the 16-gauge wire close to the platform and under the wing, then cut to correct length. Check to see all movement is free, then cement platform to wing locating block and leave to dry. The wing will now be ready for fitting to the fuselage.

Thread the control rod through the holes already cut in the fuselage formers. The wing should slide into position with the control plate platform fitting between the fuselage sides. Cement well in place using pins to hold the wing in position. Now cement the lower part of formers 2 and 3 in position under the wing. To fit the tail, slide into place, check control rod for correct length by passing end through elevator horn temporarily.

The sleek lines of the Amco 3.5 powered prototype "Red Lightning" are shown in this photograph.

Any slight adjustment required to get neutral elevator can be made by moving the tail backwards or forwards slightly. When cementing the tail in position make sure it is in line with the wing. Add balsa fillets between tail and rudder and sand to shape.

Add tail skid and block. This is notched into the bottom of No. 8 former. Plank in the fuselage underneath.

Cut out cockpit and fix platform inside to take head and shoulders of pilot.

Fit control rod to elevator horn and solder on retaining washer.

Cowling—Practically all that remains to be done is to make the lower cowl for the engine. To do this, fit engine with propeller and $1\frac{3}{4}$ in. K.K. spinner. Sand top cowling to shape and fit two pieces of ply to either side for dowels as shown on plan. The upper pieces should be cemented firmly to the upper cowling. The lower pieces are lightly cemented to the upper ones. Drill holes for dowels.

Cut out a block of soft balsa roughly to the size required and halve down through centre. Hollow out until both sides fit over engine and come together. (An exhaust is fitted to the original and this has to be cut down to get inside the cowling comfortably.) Cement the two halves together and carve the outside to shape. Be sure to leave $\frac{3}{4}$ in. of cowl projecting below the fuselage as this is where the main air-cooling exit comes. Sand to final shape. Cut out air and exhaust vents and $\frac{7}{8}$-in. hole for the compression lever, also one for the needle valve. Take off the cowl, sand the inside smooth and give a coat of dope.

Cement the cowl to the lower pieces of ply, when dry prise apart and fit dowels. Dope on silk covering which makes a really strong job of the cowl. Insert a piece of hardwood across the back of the inside of the cowl, thus joining the two sides together. A rubber band will be sufficient to hold the cowl in position.

Finishing

Cover the whole plane, with the exception of the lower cowl, with Modelspan doped on, adding silk fillets to the wing roots. Give two coats of sanding sealer. Rub down each coat. Apply two coats of cellulose of the desired colour, when dry coat with fuel-proofer. Hendon-W will give you an exhibition finish.

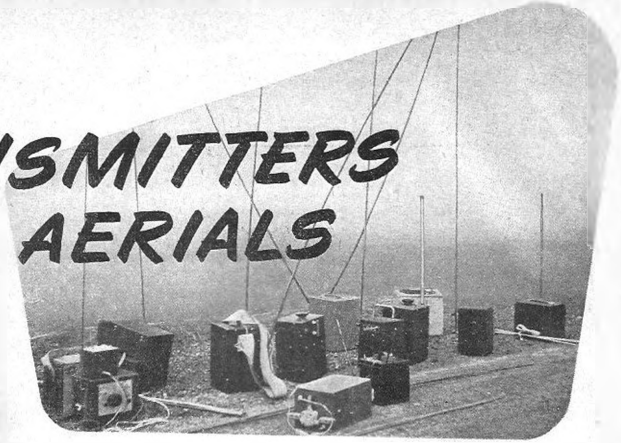
Flying

Before trying out make sure the c.g. is half way between the front line and the leading edge. A brass flywheel is fitted to the original and this brings the c.g. to the correct position. A piece of plasticene in the spinner cap will also serve very well.

The best combination of fuel and propellor found so far is Mills Diesel to which is added a small proportion of castor oil and a 9 × 10 Truflo cut down to 8 × 10.

Red Lightning should give any team a good run for their money.

TRANSMITTERS AND AERIALS



By
G. Honnest-Redlich

THE main consideration of carrier-operated R/C equipment is range, and I have listened to conversations between R/C enthusiasts and read articles on various circuits designed to give improved performance, but one important point has been either taken for granted or ignored altogether. Transmitter powers are often quoted, but how much of that power actually *leaves the aerial* is not known, and after all that is the important factor. Means for checking the amount in watts are only relative to a definite standard and the instruments required are not within the normal amateur's means.

Taking the transmitter first, the " power " usually referred to is the H.T. battery consumption, that is the battery terminal voltage multiplied by the current flowing in amperes. As an example : a 120 volt battery in a circuit passing 20 Ma (.02 A), then the power consumed by the circuit is 120 × .02 = 2.4 watts.

Now the power consumed does not mean that it is available at the output. Two engines, both consuming one gallon an hour can have greatly differing outputs, due to inefficient combustion, bearing friction, etc.

In a transmitter we also have two major reasons for inefficiency. 1. Incorrect component values, and 2, valves and components unsuitable for the frequency used.

It would take a lengthy treatise to go into this subject thoroughly, but we can give the main ideas with the help of a fairly standard H.F. oscillator circuit.

This is the cross-connected Hartly oscillator circuit which is used in one form or another in the majority of R/C equipment. There may be two separate valves, or a more modern double valve may be used.

The one major cause of losses is in long leads in the R.F. circuit. The R.F. power generated is concentrated in the tuned circuit L1. C1 (often referred to as the tank circuit). At 27 Mc L1 will be a coil of only a few turns, and if connections to the valveholder, also the internal wires of the valve are a large percentage of the coil wire length (actually we should talk of " inductance," but wire length is an approximate value and easier to understand) then power will be dissipated outside of our " tank circuit " and will be wasted.

The second point of component values is more difficult. For every frequency band there is a definite optimum L to C ratio. That is a size of tuning coil compared with its tuning condenser. In practice we must use a slightly smaller L to C ratio in order to obtain frequency stability when loaded with an aerial.

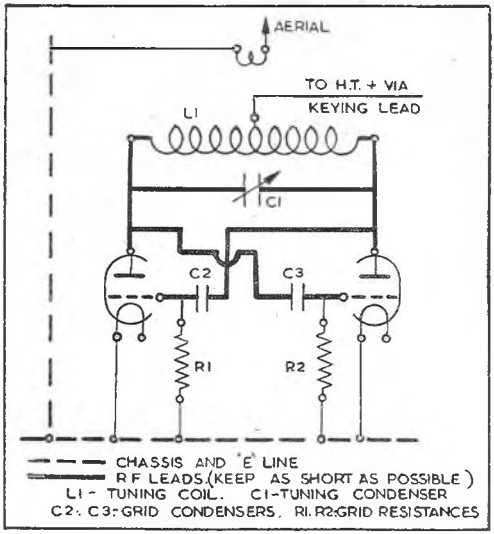
For a rough check at 27 Mc, the tuning coil should be chosen to suit the band with a condenser of about 20 pf. The grid condensers and grid resistances are chosen according to the valves used. With the double triode Mullard DCC 90 about 80 pf and 10,000 ohm are an average.

A further source of power dissipation is the proximity of conductors to the tank coil. All chassis and screening metals should be at least one coil diameter away from the coil sides, and one and a half coil lengths away from the ends.

Bearing this in mind, we now have the maximum R.F. power concentrated in the tank coil. How do we extract it ? Just as a motor has to be matched to its load, so we must gear our coil down. A pick-up loop of two turns at the neutral centre of the coil should lead with the shortest connections, one end to the metal chassis, the other end to the aerial terminal.

The aerial also should be matched, and at 27 Mc is approximately 8 ft. 4 in long This takes the coupling coil into account, but a slight variation will be automatically taken up by the " pulling " effect of the tuned circuit.

Any great variation of aerial length will materially



reduce radiation, for example the practice of holding another aerial on to the existing one when the plane is out of range, will reduce the chance of getting control back again.

The ¼ wave monopole is the best simple type to use. A double ¼ wave dipole will give a slight increase of radiation, but to save space by folding it up at an acute angle will definitely reduce radiation. With the two arms parallel radiation is nil, as they are progressively opened out, so radiation increases rapidly at first, and then to a lesser extent between 90 deg. and 180 deg. My field pattern tests have proved that the ¼ wave monopole is quite as good as a 90 deg. dipole.

Now, how can we test and check for the best component values and also for the optimum aerial length and type?

A field strength meter of either valve or germanium crystal type, of which several have been described, is required. We must set up our transmitter and F.S.M. at a distance apart which will give a readable deflection on the meter of the F.S.M. The position chosen must be free from shadowing by building or metal fences, etc. An open space like a suburban garden is quite usable. The position of both transmitter and F.S.M. must be accurately marked, as all our checks are relative only, and after every alteration to transmitter values the same positions and set of conditions must apply.

Variations of aerial lengths, grid resistors, grid condensers, etc., should be made to give the greatest deflection on the F.S.M.

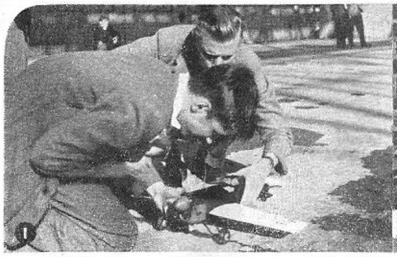
This is the only way to ascertain if you are increasing radiation by alterations to your transmitter. Alterations to produce a higher anode current and input power are not always accompanied by an increase of radiation—actually they may decrease it.

One further point. In purely radio books, radiation patterns or "polar diagrams" of transmitter aerials are often shown. These are, from a R/C point of view, misleading. They refer mainly to the direction of radiation strength in respect of reception over great distances. Over the comparatively very short visible distances of R/C these patterns do not apply. Radiation and reflections from the transmitter case itself, the keying lead and ground conditions all tend to even out the distinctive "lobes" and gaps. As when a stone is dropped into a lake, the wave pattern is distorted by neighbouring objects and floating twigs, etc. Only at a greater distance from the centre does the true pattern predominate. "Polar diagrams" also do not indicate the great reduction of signal strength within a few feet from the ground. This is very apparent, when the model is checked at its extreme range on the ground and is then raised above the head.

Finally a warning: circuit changes will ususally cause frequency changes, so check your frequency after tests.

RADIO CONTROL QUERIES SERVICE

Arrangements have now been made with Mr. G. Honnest-Redlich, who is one of the foremost experts on radio-control, for readers of MODEL AIRCRAFT to avail themselves of his services in overcoming their R/C problems. Queries should be addressed to the Editor, MODEL AIRCRAFT, 23, Great Queen Street, London, W.C.2., and must be accompanied by a stamped addressed envelope.



Southern Counties Rally

Following the precedent established last year the Southern Counties Rally was held on Thorny Island, Emsworth, to coincide with the "Battle of Britain" Sunday, by the kind permission of Group Captain D. J. Eayrs, C.B.E., D.F.C., the Officer Commanding the Air Force station.

Unfortunately a heavy gale blew during the preceeding night and though it abated slightly during the morning, it remained at gale force during the whole day and marred the proceedings. As a result entries were few and two of the events had to be abandoned.

The blitzed hangar on the aerodrome provided just sufficient shelter to enable the team C.L. contest to be run off in comfort and this proved to be the most popular contest in consequence. Particularly as the winner—Ron Moulton—had Henry J. Nicholls as his mechanic, and it was worth travelling quite a long way to see H.J.N. in his canary waistcoat sprinting round the arena like McDonald Bailey!

1. The Gosport team starting up their Team Race entry.
2. Phil Smith (Bournemouth) tunes up his "Philibuster" prior to the Team Race event.
3. Norman Butcher starting up the Croydon club's team racer.
4. J. C. Plank of the West Middlesex Club, winner of the Open Rubber Contest.
5. Henry J. Nicholls, who acted as pit attendant for Ron Moulton, winner of the Team Race.
6. Group Capt. D. J. Eayrs, C.B.E., D.F.C., presents the Southern Counties Trophy to the winner.
7. D. H. Baker of the "Bad Pennies" Club makes a last moment adjustment.

Contest Results

Open Sailplane Contest ("Hunt" Trophy)

1.	I. Wells, Chichester	Score	92.3 sec.
2.	R. Smith, Croydon		71.0 sec.
3.	T. Geesing, Croydon		61.1 sec.

Open Rubber Contest ("Tip-Top" Trophy)

1.	J. C. Plank, West Middlesex	Score	256.3 sec.
2.	M. Marcus, Croydon		144.0 sec.
3.	N. Standing, Croydon		105.1 sec.

Open Power Contest (Portsmouth Power Trophy)

1.	E. J. Self, Alton	Score	56.0 pts.
2.	D. H. Baker, Bad Pennies		38.8 pts.
3.	—Walpole, Sutton By-Pass		36.5 pts.

Open Stunt Control-Line Contest (Portsmouth City Council Trophy).

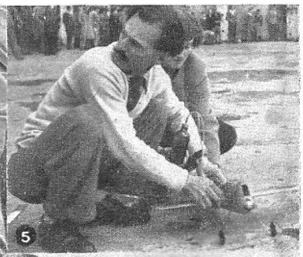
1.	C. A. Bates, Luton	Score	279 pts.
2.	A. Piacentini, Salisbury		157 pts.

Team Race

1. R. G. Moulton, West Essex, (Speed for final :—54.8 m.p.h.).
2. K. Muscott, West Essex.

Heat Results Heat 1. No finalists

2.	R. G. Moulton	58.85	m.p.h.
3.	C. A. Taylor	47.4	m.p.h.
4.	K. Muscott	65.8	m.p.h.



WHEN it comes to spending Christmas my views are pretty one track, and that track doesn't go much beyond the old ancestral flue pipe. True, I might hoof it round to the local if the orange-juice begins to run a bit low, but you can generally take it that the old cat takes second-best place on the family hearthrug during the pud-and-booze season.

So a few days before this year's festivities I was dreaming of the delights of a nut cracking sesh on the home front, when the post arrived. Fifty per cent. of the shoal lying on the doormat turned out to be a greetings card, while the remainder was in the form of a letter lurking beneath a penny stamp. Now there's only one character I know, this side of Aberdeen, with such a frugal outlook, and that's old Froggy Manners : *ex*-London barrow boy recently turned yokel fruit-grower, and now exiled in a bucolic little backwater called Chipping Balsa.

True enough, it was his fruity fingers that had scrawled the following :

The Windings,
Stretch Lane,
Chipping Balsa,
Jetexshire.

Dear Tosho,

Well, how goes it, me jolly old prop-flicker? Still bashing away at the balsa mutilation stakes? Matter of fact, I've been having a bit of a dabble myself lately—even managed to round up a few local hayseeds to form a club. Talk about laugh, though. I roped in the village idiot as a member, and after giving him a shuft at the old glow-plug sent him out with an empty bottle to milk glow-worms.

Hows about tootling over to see your old china this Chris. I've got a bit of a team-race laid on for Boxing Day, so why not tote along a job and waltz a few laps?

I'll have the red carpet out for Wednesday.

Your Old Oppo,
FROGGY.

Being a strong minded sort of cuss this genial invite left my dream of a Christmas encamped on the homely hearthrug as before—one hundred per cent. intact.

Now, I can't say I've ever mosied up to the North Pole or shinned up Mount Everest, but I'm of the firm opinion that a winter trek into the bleak wastes of Jetexshire puts me right up among the great explorers of this age. After five bone-shaking hours in some wheezy old refugee from a railway museum I arrived at a dump called Much-Bunching-in-the-Fuzz : the nearest township to Chipping Balsa which boasted a railway station—although you'd think they'd have the decency to keep quiet about it.

Outside the station the only form of locomotion in sight was a 1 h.p. affair called a "buggy." I've often wondered why such contraptions were called "buggies," but I've got a pretty shrewd idea now.

The driver of this wheeled antique turned out to be an ancient character in a peaked cap and face to match.

"Be you wanning to go to Chippin' Balsa, young sirr?" he asked, with bronchial accompaniment.

"Matter of fact, I do."

"Then oi'll 'elp ee in sirr," replied said ancient between sundry blasts on the sort of nose that would put a temperance society on its mettle.

After jogging along a while the cabby fixed me with a rheumy eye : "And wherr in Chippin' Balsa do ee want to be drapped, young sirr?"

"Do you know 'The Windings'?"

"Aye," he replied with a sinister leer, "Oi be knowing 'Windings' aw right. That be where that young furriner, Mr. Manners, lives, 'im what's got the 'ole village in uproar."

"Why, what's his latest racket?—I mean, what's all the trouble?"

"Trabble," he snorted, "It's them there model airplanes is the trabble. Proper daft on 'em 'e be. Oi never did 'ear sich a noise as what them things make. Nuff to froighten a soul out of its body."

"Do the villagers object then?"

"Abject," he replied shrilly, "Oi'll say they abject. Take Farmer Muckrake for one. 'e be in a turrible temper, what with 'is 'ens off their laying and the old bull not his usual sproy self loike. Then there be the Squire complaining as 'ow the voibrations upsets his gout. But worrser 'an that there be Lady Puff-Snootle from Manor. Aye, she be the one as what counts in village, and oi've been told she's been down to Parish Council in a proper 'uff, seeing as 'ow 'er little Pekinese can't sleep so well on Sunday. Oi wouldn't be at all surproised if they don't put a stop to it."

"You mean ban it?"

"Aye, they'll probably do 'at too," he replied.

Eventually we shuddered to a stop outside "The Windings"; and there at the gate, as large as life and twice as 'orrible, was Froggy himself doing a grand host act.

"Wotcher, me old tosheroo," he hailed, "long time no see, eh? Have a jolly journey?"

"When you talk about that journey you touch me on a tender spot," I said, rubbing same.

"Never mind," was his hearty reply, "toddle in and thaw out the old torso."

Now, I've known Froggy for some years—unfortunately—and as we yarned it round the old fire I detected a somewhat bleak mist in his eye.

"Not worried, Froggy?" I asked, "if you are, just spill a tearful earful to your old unk."

"Oh, it's nothing much, tosh," said that worthy, "just that it looks as if the old 'ag at the manor is going to put the kibosh on the village green team-race caper."

"So the cabby was telling me."

"Yep," he continued, "she's already been down to see the old gasbags on the council with a lotta guff about her poor Woofles being scared by the screaming noises from the village green. As if there 'asn't always been screaming noises coming from the village green—and not from models either," he added meaningly.

"Well, what do you think they'll do?" I asked anxiously.

"They've arranged a special conflab for tomorrow morning," he answered glumly, "and it's an almost odds-on cert. that they'll pull down the iron curtain with a bang. Still, worrying'll never get the baby speed job a new dolly, so let's have a spot of dope thinner and then toddle over to do a little circulating on the green."

So early p.m. saw Froggy and me wiring up for a bit of a duffy on the village green. We rigged up Froggy's racer first—me as chief mech. and Froggy doing the war dance act in the centre.

Just as the job started to beat up the laps I caught a glimpse of an old dear on the far side of the green. She appeared to be sporting a fur muff—or so I thought until said fur muff took a yelping leap to the ground and began to foot it in our direction. As it did so it took on the more doggy shape of a pop-eyed little peke—and a peppery little pup to boot. This I tried, but neatly evading my flying hoof the said lap-dog started lapping the circuit in full pursuit of Froggy's racer. And not doing so badly either, considering that slicked up bullet was chugging along at a modest 60 miles per.

So there I was, sitting back enjoying the fun when I noticed a begaitered geezer approaching with a large stringy canine—a sort of mongrelised greyhound, called a lurcher. Well, probably the sight of the old peke haring round gave it ideas of White City fame, and doing a nifty trap "6" style getaway, batted off full bore after that puffing pup.

Leg power, notwithstanding, the peke did its best to maintain a safe lead, but amid a flurry of fur and yelping the lurcher snaffled the lap-dog in its sharp snout and began to toss it skywards.

After a few repeat performances of this procedure, during which the poor peke went through every stunt in the book, plus a few special manoeuvres thrown in, things began to look a bit desperate. And what with the commotion of the dogs, the begaitered geezer bellowing at the lurcher, and the old girl flapping around with anguished "poor Woofles," it was quite some shemozzle.

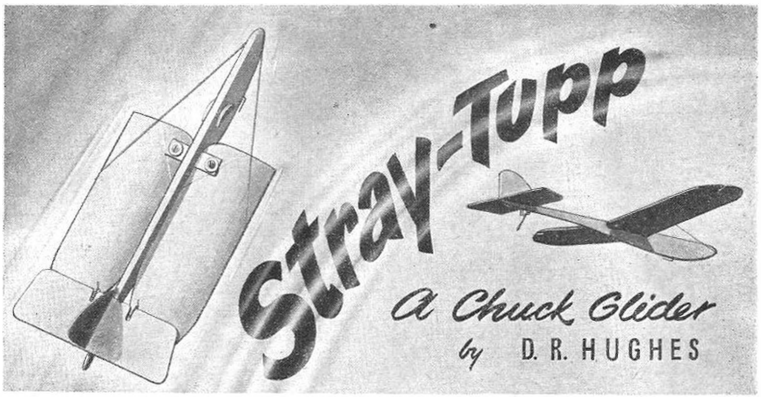
Then it happened. Old Froggy, quickly sizing up the situation, brought down his "bomb" in a screaming dive, straight towards the bloodthirsty lurcher. Which canine found little joy in the sudden contact of a sharp spinner with its muscular hind-parts, and expressed such dislike by a lightning dash towards the far horizon—with the begaitered geezer in full pursuit.

Poor old Woofles, looking a trifle threadbare in places, just lay there, but 99 per cent. intact, and still breathing. Up rushed the old dear—that is Lady Puff-Snootle—and picked it up with a "Poor Woofles, come to mummy," or nauseating words to that effect. Then turning to Froggy, who was running a rueful eye over the remains of his pet team-racer, she cried: "Oh, you dear, brave boy. You saved my little Woofles' life. And to think I was going to stop you playing with your nice toys. Please do come to my Christmas party, both of you—dear, dear boys."

It turned out to be quite some party—and for the first time I was struck by the beauty of the village; well, she ought to have known it was just my fun.

And, oh yes, the scheduled team-race went with a swing, and as a memento of that occasion I have before me a shaving mug presented as 2nd prize by Lady Puff-Snootle.

But I'm still dreaming of a peaceful Christmas—some day!



THE writer "dreamed-up" the theory for this type of model several years ago, when chuck gliders were in their heyday. Not until recently, however, has the time been available to put it into practice. It has now been proved to operate successfully on the simple model shown here, and no doubt once the principle is grasped, modellers will be able to develop larger and even more efficient versions for themselves.

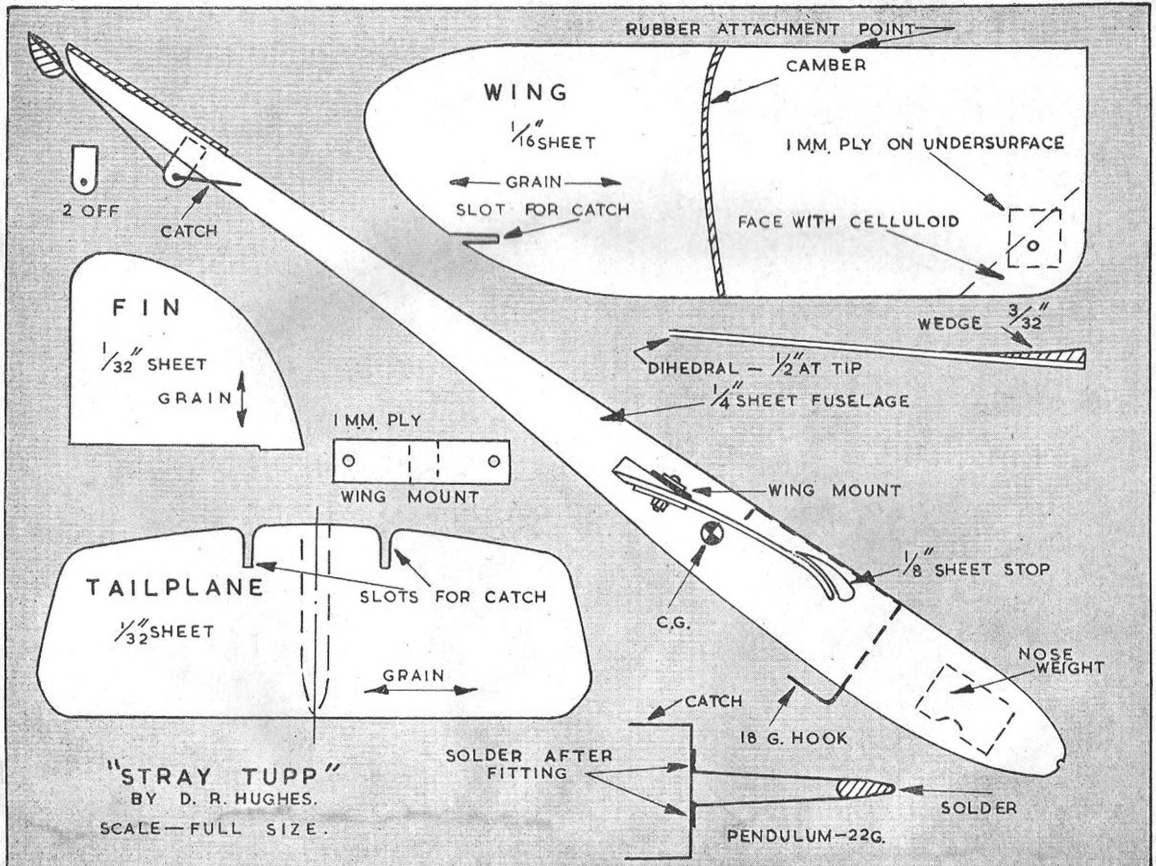
Now, normally, the height which a chuck-glider can reach (apart from when they catch thermals) is rather limited, even when extra force is applied in the form of a catapult. If, however, as on our model, the wings can be folded back, so as to produce zero lift, the model can be "shot" vertically to a considerable height. The wings then fold outwards into flying position and the model commences its flight.

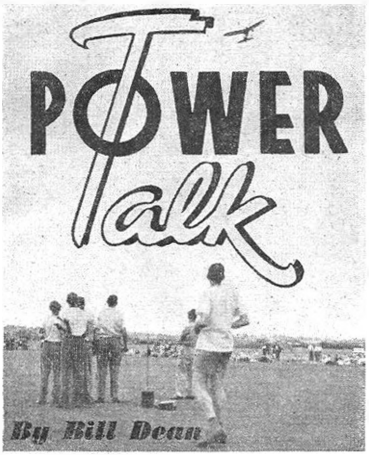
Building the model. Usual solid glider methods are used—the important part being the wing attachment. The ply mount must be cemented through the fuselage at the exact position shown on plan. The wedge-shaped dihedral-keepers are cemented to the wings and reinforced as shown. 9 B.A. bolts are used for the swivel attachment, with washers on each side. The wings should swing freely, but not to be extent of being wobbly. The $\frac{1}{8}$ in. balsa stops fitted on each side of the fuselage will keep the incidence correct. N.B. *The wings fold under the tailplane and parallel with it.*

The catch (see plan) and pendulum are made up from 22 gauge wire, the catch being threaded through the two ply bearers before soldering the pendulum on to it.

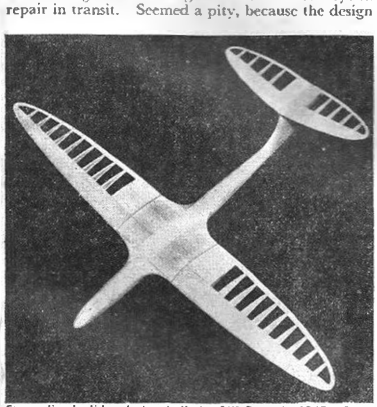
Now fasten a length of 1/64 in. rubber, or similar, at the points indicated on the wings, to pass round the nose, just tight enough to keep the wings in the forward position. Some trial and error adjustments will be necessary to get the *exact* angle of the pendulum (that on the plan is as the prototype, but will differ slightly with each model). Add weight—in the form of solder—to the end of the pendulum until it is enough to release the wings when the model reaches a slightly nose-down position. It is not necessary to *fly* the job to find this, of course, the procedure being to hold it vertically, with wings folded and catch in position and gently turn it into its flying altitude. The pendulum should then drop, releasing the wings. Add weight to the nose—(c.g. shown on plan) and trim in the ordinary way, with wings in flying position.

For catapult launch, fold the wings and hold the model vertically with the pendulum catch holding the wings back. Launch just slightly forward of the vertical, so that the model drops over *forwards*, and not on its back. This is easily achieved with a little practice. Very good heights can be attained and hours of enjoyment can be had from experimenting with these rocket climb gliders. One wonders, too, if the principle might not be applied to Jetex or even rubber-powered models?


RUBBER ATTACHMENT POINT
CAMBER
WING
1/16 SHEET
GRAIN
SLOT FOR CATCH
1 MM. PLY ON UNDERSURFACE
FACE WITH CELLULOID
2 OFF
CATCH
FIN
1/32" SHEET
GRAIN
WEDGE 3/32"
DIHEDRAL — 1/2" AT TIP
1/4" SHEET FUSELAGE
1 MM. PLY
WING MOUNT
WING MOUNT
1/8" SHEET STOP
TAILPLANE
1/32" SHEET
SLOTS FOR CATCH
GRAIN
C.G.
NOSE WEIGHT
CATCH
18 G. HOOK
SOLDER AFTER FITTING
SOLDER
PENDULUM—22G.
"STRAY TUPP"
BY D. R. HUGHES.
SCALE—FULL SIZE.



● LOOKING THROUGH some old model photographs the other day, we came across one of a streamlined glider we built exactly five years ago when in Southern Rhodesia. Balsa was scarce in that country at the time and most of the model was built from a local softwood called "magongo." We only had time for brief test flights before being posted back to England and the glider was smashed beyond repair in transit. Seemed a pity, because the design appeared promising and several months of work had gone into the design and building. Now if only we can hunt out those plans we should like to check up and see just how close it comes to the A-2 formula.



Streamlined glider design built by Bill Dean in 1945. Span approx. 45 in.

The design was based around a sturdy lift-contributing centre section—with the fuselage added fore and aft. In the front view, the fuselage was small and circular in section, with the wings thickened up to make a good root joint. Aspect ratio of the elliptical wings was 10.4—section being Gottingen 426. Tongue and box wing fitting was used and the tailplane was free to pivot through 360 deg. in a crash. No external rubber bands were fitted.

★ ★ ★

● FEW 1950 model meetings have been blessed with ideal weather conditions and the 2nd International Jetex Contest at Fairlop (September 30th) was no exception. The contest started at about 1.30 p.m., under low grey clouds, which soon fulfilled their promise of rain. J. N. Mansour, one of the managing directors of the Jetex concern, told us that some good flying was anticipated as several of the finalists had put up times of over 10 min. in their eliminating trials. Michael Pitel of the Ampleforth College Cub topped the list of the 28 finalists with a flight of 10 min. 42 sec., using a 350 motor (three charges). Entries included an all sheet 50 powered *Rudolph* (featured in June, 1950, *Air Trails*), sent over for proxy flying by S. Fruciano of Brooklyn, New York.

Flight ratios were calculated according to the motor size and number of fuel pellets used. We saw several designs with the fins positioned under the tailplanes, like R. A. Twomey's 1949 contest winning *Firecrest*. This time, Twomey had boosted up his last year's design to approximately 1½ times its original size, to give a span of 40 in., and fitted it with two 350 motors. But this model lacked the performance of the 200 powered version and after the first flight it became obvious that its owner would have little chance of retaining the handsome I.C.I. Trophy for yet another year. As Twomey later agreed, it was a pity that he had not entered the single 350 powered model with which he won the Jetex event at the recent R.A.F. Championships. Few commercial designs were flown this year, apart from the 350 powered *Durajet*, which still outclimbs most of the other Jetex designs we have seen flying.

John Magson of Warley, Halifax, entered a 350 size mid-wing (jet on top) which he told us had been developed from his *Roma* glider design. Area was 200 sq. in.; a 40 per cent. tailplane (dihedralled) being fitted and an all up weight of 6¼ oz. Most unusual model flown in the contest was a 12 in. diameter flying saucer (with dihedral) by A. Sanger of the Southampton Club. Twin fins were fitted front and rear, the 100 motor being clipped on top, level with the leading edge. C.G. was at about 25 per cent. back from the leading edge. This model seemed rather underpowered, although we were told that it performs best in a stiff breeze. Norman Butcher took an afternoon off from stunt and team

racing, to enter a conventional 144 sq. in. 100 model, which featured a sheet fuselage with the jet clipped to one side. One of the neatest designs we saw was a 200 powered original, by T. J. O'Brien of Bury St. Edmunds. Wing area of this model was also around the sq. ft. figure which just goes to show the difference in opinion that exists, regarding the amount of wing area needed for the various motors. The jet was partially cowled and set underneath the fuselage —normal dihedral being used, plus a " V " tailplane and small central fin. Ray Malmstrom of Hardwicke turned up with a 50 powered semi-scale that looked just like one of those models he draws in his cartoons. Complete with motor, this little job tipped the scales at just under ½ oz. Wing area was 52 sq. in., the front portion of the fuselage being carved from soft block. The jet was enclosed in a *Fouga* type cowling, above the fuselage.

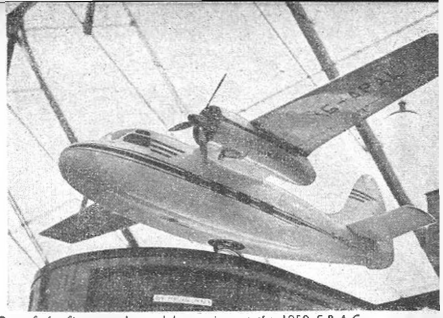
P. B. Allaker of West Ewell stepped up to collect the first prize of £20 and the trophy. His two flight ratio was 8.48—not so high as the winner last year—but good all the same, considering the far from good conditions. The model was powered with a 200 motor (under the fuselage) ; featured a polyhedral wing (30 in. span—138 sq. in. area), and the fin was placed on top in the conventional manner. Construction was typical of the type usually associated with lightweight rubber models, with a square section fuselage and banana shaped wing ribs. Weight was only 2.6 oz. with unloaded motor.

Laurie Barr of the Pharos Club claimed the second prize of £15. His model had a very light framework and the 100 motor was simply slung under the fuselage, without any fairing. Laurie's best flight was 2 min. 21 sec. and his final ratio worked out at 7.1. The third place went to R. Kreeger (also of Pharos) who was close behind with a 6.54 ratio. Fourth was taken by Michael Pitel with a ratio of 5.44. H. O'Donnell of Salford qualified for the best flight by an under 16 competitor (prize £5). His ratio was 5.08, using a 200 motor. Longest flight of the contest was by J. Ralph of Gloucester, who put up 2 min. 56 sec. in the first round with a 200 fitted model. Even though two pellets were used, this still gave a ratio of 6.28, but a poor second flight of 1 min. 25 sec. robbed this competitor of a high placing on the results list. It is interesting to note that none of the five winners used more than one charge for each flight. Many familiar names appeared in the list of competitors ; including Norman Marcus, Barry Haisman, W. Henderson, who took 3rd prize last year, Ray Jessop and J. Gorham.

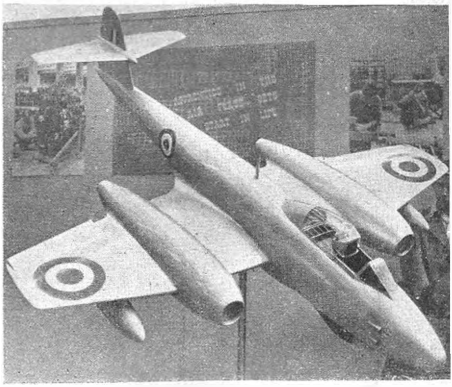
All competitors were paid travelling expenses, given refreshments, and even provided with a tent for repair work. The prizes were extremely generous by the usual British standards, £35 being shared between the winners.

In Brief

In last month's " Power Talk " we gave the *minimum* wing area for Class " A " team racers as 85 sq. in. We now learn that this has been altered to 70 sq. in. Other specifications remain unaltered.



One of the finest scale models on view at the 1950 S.B.A.C. Display was this " Percival Prince." This photograph was taken on Ilford H.P.3 film—exposure 1/200th at f5.6—using the available light source.



This beautiful " solid " model of the " Gloster Meteor " which was displayed on the Royal Air Force Stand at this year's " Model Engineer " Exhibition was admired by the modellers who visited the show.

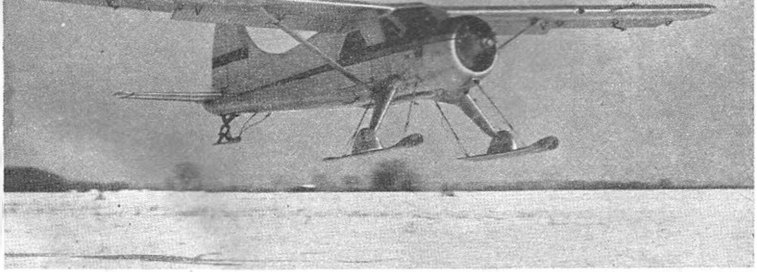
Well-known modeller, Cyril Shaw, of the Zombies was responsible for the excellent finish on the Westland models—including this Westland-Sikorsky helicopter—exhibited at the S.B.A.C. Show.

Prototypes Worth Modelling

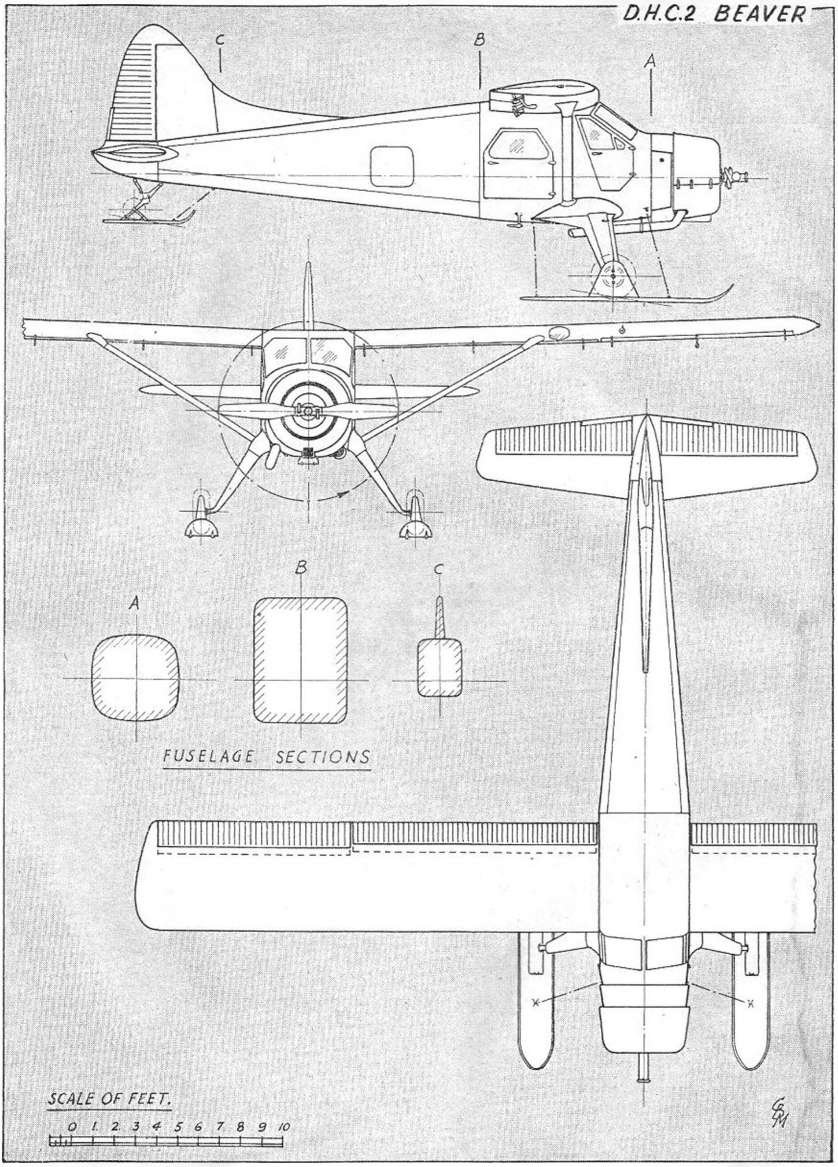
BY C. B. MAYCOCK

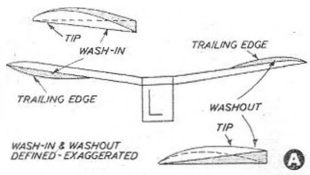
No. 6 THE D.H.C.2 "BEAVER"

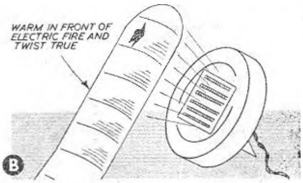
IT is pretty safe to describe this machine as a natural for R/C, scale model enthusiasts. It has a roomy fuselage, simple lines and generous fin area, also the large doors to the cockpit, four in all, are in just the right positions for access. If the model is to a fairly large scale, the cylinder of the engine can form one of the nine of the Pratt & Whitney Wasp Junior of the prototype. This machine is designed for rough usage in the Canadian up-country, and can be fitted with floats or skis. All metal construction of conventional type, frames and stringers with stressed skin aft of the passenger/cargo space. The wing has a single spar, braced by steel streamline struts to the undercarriage leg-roots. A subsidiary spar carries the flaps and ailerons. The wing and tail surfaces are metal covered and the elevator, rudder, flaps, and ailerons have many pressed "ribs" in the sheet covering; this gives them great strength and allows the minimum of internal structure. This feature can be well represented by doped-on strips of fairly stout paper and it is surprising how this simple expedient does stiffen up the skin. The airscrew is a Hamilton two-blade, constant speed metal one of 8 ft. 6 in. diameter. The main fuel tanks are beneath the floor. The maximum internal dimensions, from fascia panel to rear bulkhead are 4 ft. wide by 9 ft. The control column is of the swing over type with "cow horn" style control wheel. Pitch, throttle, and mixture control levers are mounted centrally at the top of the dash. A standard blind flying panel is on the left and the radio panel on the right. The magnetic repeater compass is positioned in the roof. Normally a *Beaver* seats four but seven can be taken. They are usually left in their natural metal finish with perhaps a coloured speed streak, and the top of the engine cowling is usually painted to minimise glare. Just a reminder—the registration letters for Canada are CF- followed by three letters. One *Beaver* flying in this country was registered G-ALOW; it had cherry-red speed-streak from nose to tail broken by the registration letters midway along the fuselage. The main dimensions are as follows:—Span, 38 ft.; length (landplane), 30 ft. 3 in., length (floatplane), 32 ft. 9 in.: height (wheels), 10 ft. 7 in., height (floats), 12 ft. 1 in.; wing area, 250 sq. ft.; wheel track, 10 ft. 2 in.; maximum dimensions of cabin door, 3 ft. 3 in. wide × 3 ft. 4 in. high.



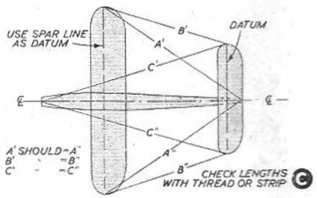
D.H.C.2 BEAVER

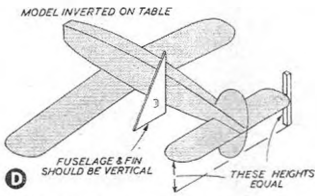




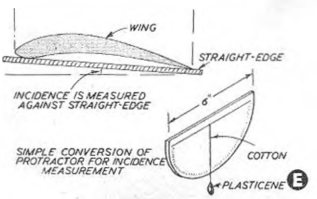


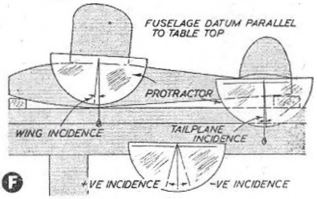
Check for, and eliminate any warps



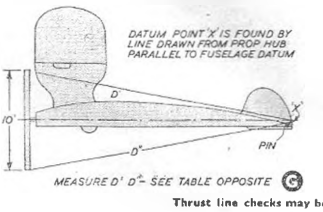


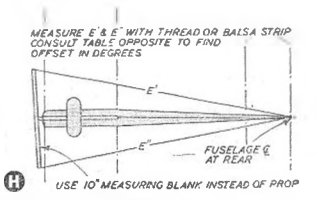
Check alignment and correct if necessary





Incidence angles should be checked with protractor





Thrust line checks may be made by indirect measurement

How to make it

No. 12. RIGGING THE FINISHED MODEL

(A) The main types of warps are wash-in and wash-out. These are defined in the diagram. Wash-in is *always* a source of trouble and must be eliminated before flying. Wash-out can have a stabilising effect, provided it is the same on both sides of the wing or tailplane. Some modellers, in fact, deliberately use wash-out for increased stability.

(B) Provided the structure itself was not warped initially—i.e., before covering—warps can be removed permanently by twisting the wing or tailplane true in front of a source of heat and allowing to cool with the correct setting. Hold the structure firmly about six inches in front of an electric fire and twist true. Remove after a few seconds to a cooler place, still holding. On release the structure will be found to have set this new (true) position.

(C) To check the accuracy of alignment of your new model, assemble the machine and check the dimensions shown in the figure. Datum points are the wing and tailplane tips where joined by the mainspar and the extreme rear of the fuselage on the centre line. Stick a pin in the fuselage datum point and use a length of thread or a strip of balsa for measurement. The "A" dimensions should be within $\frac{1}{2}$ in. of each other, the "B" dimensions within $\frac{1}{4}$ in. "C" dimensions should also be within $\frac{1}{4}$ in. Make any adjustments necessary, otherwise your model may develop turning tendencies in flight.

(D) You should also check the fuselage and fin for squareness, and also that the tailplane is square with the wings. Lay the assembled model on its back on the top of a table and check the fuselage and fin with a set square. If the fuselage is not square, then most probably the fault lies with the wing—either having unequal dihedral angles, or not mounted correctly on the fuselage. Correct this first. The tailplane is checked for squareness by simply measuring the height of each tip above the surface of the table. This can be done with a piece of wood, marking off each tip height. It may be necessary to add packing between the tailplane and the fuselage on one side to get this correct. A tailplane raised on one side will cause the model to turn in that direction.

(E) For checking that your model *is* rigged as per plan, a simple converter protractor is a very useful instrument. Most model wings are undercambered and incidence is measured as from a flat surface resting against the bottom surface of the wing. It is most convenient, therefore, to choose a protractor size larger than the chord of your wing. A simple plumb bob made from a length of cotton and a lump of plasticene then completes the instrument

(F) To check incidences, block up the model near the edge of a table so that the fuselage datum line is parallel with the top of the table. You can determine the correct attitude from the plan, or, if you wish, set the model up so that the tailplane seating is at zero incidence. This you can check by resting a spirit level on the tailplane platform and adjusting the blocks under the fuselage until this platform is truly horizontal. Holding the protractor against the undersurface of the wings and tailplane in turn, you can then read off, directly, the respective incidences. If you have set up your tailplane platform at zero initially, your tailplane incidence should check out at zero. As a check, measure incidence at various points along the wing.

(G) Checking downthrust is a little more difficult, but very important on a power model where thrust line trim can be critical. First find the exact position of the fuselage datum point "X," as described on the drawing, and stick a pin in here. Replace the propeller with a blank or block of wood exactly 10 in. diameter and measure D′ and D″. Use a blank instead of a finished propeller since the latter may not be perfectly true in side elevation. The difference between D′ and D″ can be converted into degrees downthrust by reference to the table below.

(H) Sidethrust measurement is done in an exactly similar manner, with 10 in. diameter blank replacing the propeller and measuring the distance from each tip of this blank to the extreme rear of the fuselage on the centre line. Make sure that the measuring blank itself is drilled true and is exactly at right angles to the propeller shaft of the motor. Measurement difference can be converted into degrees sidethrust from the table.

	Difference in 'D' or 'E' dimensions (inches)										
	0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
Degrees Offset (Approx.)	0	$\frac{1}{2}$	1	$1\frac{1}{2}$	2	$2\frac{3}{4}$	$3\frac{1}{2}$	4	$4\frac{1}{2}$	5	$5\frac{1}{2}$

Jetex CONTEST

In dull rainy weather conditions, twenty-nine finalists competed for the I.C.I. Trophy and generous cash prizes in the Second Annual Jetex International Contest held at Fairlop Aerodrome, Essex, on September 30th. The fliers came from all parts of the country. Their travelling expenses having been paid by the organisers, Messrs. Wilmot, Mansour & Co., Ltd., and there was one entry from the United States which was flown by proxy.

During the contest, some excellent flying was seen and P. B. Allaker of the Surbiton and District M.A.C. made two very consistent flights with his Jetex "200" powered model, to win the I.C.I. Trophy and the £20 cash prize.

(1) P. B. Allaker of the Surbiton and District M.A.C., winner of the Second Jetex International Contest, with his model.

(2) The winner with the I.C.I. Trophy about to receive the cheque for the £20 1st prize.

(3) Three of the competitors in the finals with their models.

(4) O. C. P. Twomey of R.A.F. Cottesmore, winner of the 1949 contest who also flew in the finals this year.

(5) Not entered in the contest the Jeticopter is shown in this photograph on one of its impressive demonstration flights.

(6) L. Barr of the Pharos M.A.C., launching his model to gain 2nd place.

(7) The Jeticopter, powered by two 350 Jetex units.

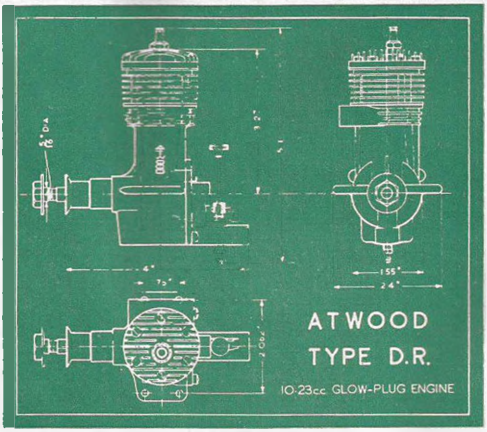
M.A. Engine Tests

No. 18—THE ATWOOD "GLO-DEVIL"

IT is a year since an American unit was last dealt with in this series and while the sale of U.S.-built engines through regular channels in Great Britain is prohibited by import restrictions, it is felt that the occasional inclusion of an example of American model engine design in these tests is, nevertheless, justified, if only for purposes of comparison with our own products. It should, perhaps, be mentioned, however, that obtaining a U.S. engine (where this may be desirable on the grounds of non-availability of a home-market equivalent) is by no means impossible as "swops" with North American correspondents are frequently effected among British enthusiasts. The British customs duty and purchase-tax payable, incidentally, on American model engines, amounts to a little over 50 per cent. of the declared value.

The Atwood "Glo-Devil," subject of this month's test report, is particularly interesting on several counts. It is, of course, a type at which the Americans excel, for, despite the tremendous progress made by British manufacturers during the past two years (the best of our Class "A" diesels are now superior in performance to any similar capacity motors produced outside Great Britain) there is no British engine in any way comparable with the "Glo-Devil" at the present time. The few 10 c.c. two-strokes made in this country are mainly of the strictly "racing" type, whereas the Atwood can be considered as a multi-purpose competition type for free-flight or C/L stunt work. It has an exceedingly high power output—only slightly below that of racing types—available at shaft speeds suitable to these latter types of installation, and has the advantage of much reduced weight as compared with the 10 c.c. speed engines, which generally scale 15-16 oz.

The "Glo-Devil" Type D.R. first appeared during the 1948 season, being the latest glow-plug version of the long line of Atwood "Champion" 10 c.c. spark-ignition engines. Compared with the earlier J.H. model "Champion," this engine featured a 25 per cent. larger exhaust port area, a 30 per cent. increase in transfer area and volume, a compression ratio raised from 6.5 to 8.0 to 1, and a modified venturi intake. The system of induction, involving the use of two rotary-valves, which had been an exclusive feature of the "Champion" series for many years, was, however, retained. The spark-ignition "Champion" and the glow-plug "Glo-Devil" are basically the same engine and the substitution of a V.2 sparking-plug and the addition of a contact-breaker (the cam for this is integral with the drive collet) are all that are required to convert the engine to spark ignition. Also available is a two-speed contact-breaker for precision C/L or R/C work.



The "Glo-Devil" is well finished, both as regards the quality of the die castings and machining. As previously mentioned, induction is via twin rotary valves. These consist of a normal shaft type crankshaft port, supplemented by a special flanged drum type driven by the crankpin at the rear of the crankcase. Both are fed from one carburettor at the rear, induction to the front valve being via a passage integrally cast with the bottom of the crankcase.

The Atwood "D.R." model was, of course, designed by Bill Atwood, one of the pioneers of the model

aircraft engine and who was responsible for the 6 c.c. " Baby Cyclone " of the nineteen-thirties as well as many other well-known designs.

Specification

Type : Single-cylinder, air-cooled, two-cycle, glow-plug ignition (provision for spark-ignition and two-speed contact-breaker.) Induction via dual rotary-valves from single carburettor, with supplementary sub-piston air induction. 180-deg. exhaust porting. Domed baffle-piston with matched cylinder head. Offset ignition plug.

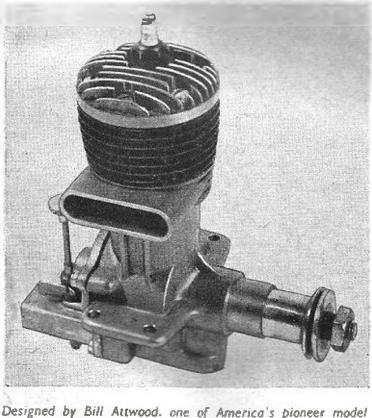
Swept Volume : 10.23 c.c. (0.624 cu. in.).

Bore : 0.940 in. Stroke : 0.900 in.

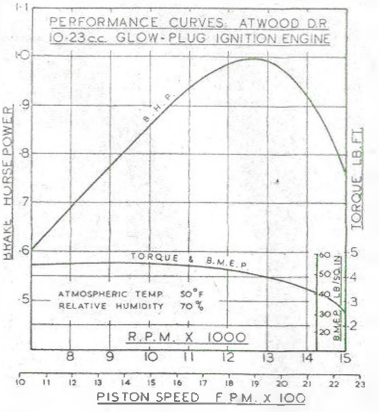
Compression Ratio : 8.0 : 1. Stroke/Bore ratio : 0.957 : 1.

Weight : 11¼ oz.

General Structural Data : Die-cast aluminium alloy crankcase with integral front bearing housing, induction passage, transfer passage and exhaust duct. Detachable rear cover of die-cast aluminium alloy carrying rear rotary-valve. Steel cylinder with turned fins. Die-cast aluminium alloy finned cylinder-head attached with six screws, including three long screws securing cylinder assembly to crankcase. Lightweight aluminium piston with two compression-rings. Fully-floating tubular gudgeon-pin with dural end-pads. Alloy steel $\frac{7}{16}$ in. diameter crankshaft running in Oilite bearing. Forged aluminium alloy connecting-rod with bronze big-end bush. Spray-bar type needle-valve assembly. Beam type mounting lugs.



Designed by Bill Atwood, one of America's pioneer model engine experts, the Atwood D.R. 10.23 c.c. glow-plug engine showed up well under test and its power-to-weight ratio of 1.4 b.h.p./lb. was the highest obtained in the " M.A." engine tests so far.



Test Engine Data

Total time logged prior to test : 1 hour.

Ignition equipment used : Champion V.G.2 glow-plug, 1.6 volts to start.

Fuel used : Record " Powerplus " Racing Blend.

Performance

First tests of this engine, carried out during the winter of 1948/49 were particularly illuminating. At this time, the writer had, on test, two new racing type engines then in early stages of development, and the performance of the " Glo-Devil " was made especially impressive by the fact that it substantially exceeded that of either racing engine. This was due, mainly, to the very much higher torque values developed by the Atwood.

The usual procedure with glow-plug engines of priming through the exhaust port, in addition to choking the intake, is adopted with the " Glo-Devil " to secure a start from cold, but thereafter the engine can be re-started, when warm, by choking the intake for a couple of flicks. Various American proprietary nitro-paraffin racing fuels are specified as suitable for use in the " Glo-Devil " and an alternative " home-brew " formula containing 25 per cent. nitrobenzene is also mentioned by the manufacturers. The use of this compound has been criticised as having corrosive tendencies although no actual evidence of this has been shown in tests. However, in the majority of glow-plug engines, nitro-benzene does not appear to have any marked advantages over plain methanol/castor mixtures. For the " Glo-Devil," therefore, a British nitro-paraffin content fuel was chosen and this gave a useful increase in output over plain racing mixtures.

Before tests were undertaken, the engine was, of course, given a period of running-in. No tendencies towards overheating or tightening up were experi-

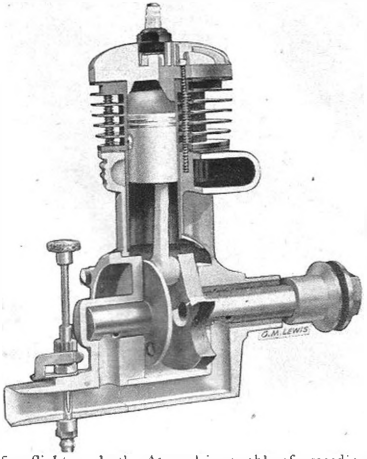
enced during this period. Load was then progressively reduced and the engine finally run up to a maximum of 15,000 r.p.m.

At speeds above 8/9,000 r.p.m., the " Glo-Devil " runs with a clear, crisp exhaust note, free from " crackle," and maintains a steady output. Between running and re-starting settings, little or no re-adjustment is needed to the needle-valve, which is conveniently located and is positive in action without being critical. No vibrationary period was evident over the range of speeds at which the engine was tested.

On the reaction dynamometer, a torque of 0.45 lb. ft. was registered at 9/10,000 r.p.m. which, equivalent to a b.m.e.p. of 55 lb. sq. in., is, of course, a very good figure and indicates that an unexpectedly high mechanical efficiency has been obtained despite the additional drag of the rear valve rotor and the absence of ball bearings. The decline in torque was at a steadily increasing rate and resulted in the peak b.h.p. being obtained at approximately 12,700 r.p.m., the actual output being just on 1.00 b.h.p. This, of course, is an exceptional performance, especially in view of the moderate weight of the unit and is reflected in a power-to-weight ratio of over 1.4 b.h.p./lb., the highest so far published in these tests.

Beyond 13,000 r.p.m., the power drops off steeply, as is usual with engines not ported for racing speeds. In the case of the Atwood, the venturi area, combined with the right-angled intake passages, would seem to be limiting factors.

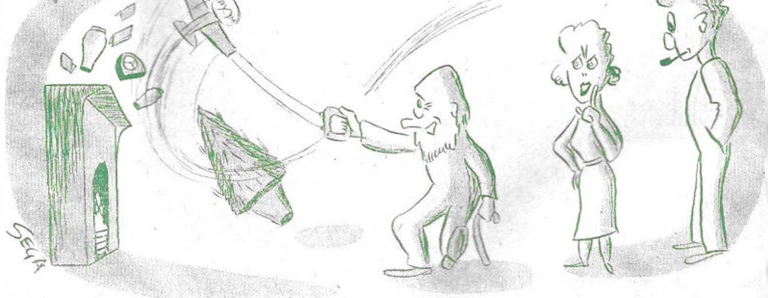
With stunt models of 500-600 sq. in., propellers of 11-12 in. diameter and 6-8 in. pitch would appear to be suitable for the " Glo-Devil " and should allow the engine to run at 10-12,000 r.p.m. in the air. For



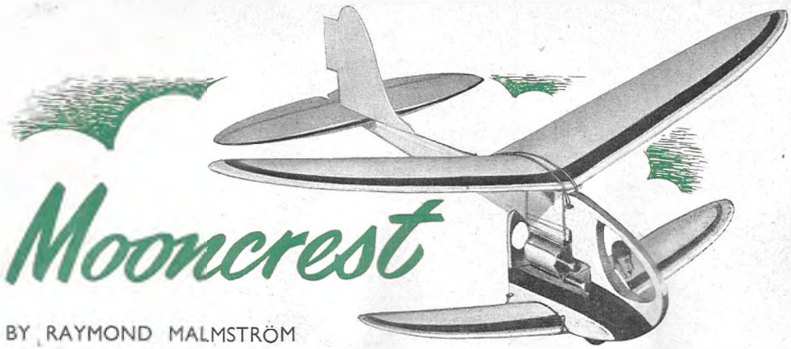
free-flight work, the Atwood is capable of exceeding 9,000 r.p.m. with a 13 in. free-flight propeller. Power/duration models of well over 1,000 sq. in. are currently being built for this engine in the United States.

Power/Weight Ratio (as tested) : 1.42 b.h.p./lb.

Power/Displacement Ratio (as tested) : 97.9 b.h.p./litre.



" Second childhood, maybe, but I still don't think it was a good thing to give Grandad ! "



Mooncrest

BY RAYMOND MALMSTRÖM

ALTHOUGH there are now signs of a large growth of interest in biplanes, in the past the majority of modellers have either been reluctant to build that extra wing or have felt that biplanes are difficult to trim. Taking a deep breath and dodging the bricks that the last sentence will probably call forth from all and sundry, the designer of the little jet-biplane described here hastens to say that the *Mooncrest* is very simple to construct, has no vices regarding trimming, and in common with most successful biplanes has a rapid and steady climb to its maximum height (*not* a corkscrew one so beloved of the over-powered pylon brigade !)

All the materials required will probably be found in the scrap box and an evening or so's work will be sufficient to complete a little model which I guarantee will provide either yourself or your young brother with a good deal of fun.

Although the original model has not yet hooked a " riser " (times in still evening air vary between 45 sec. and a minute) there seems no reason, considering the height gained during the 18 secs. (approximately) power run, why it should not. Thus after putting on the last lick of dope, add your name and address. You feel like grabbing your building board ? Good, then here we go.

Fuselage

The outline should be traced on to ¼ in. balsa sheet and carefully cut out. Note the small notches on the top section which accommodate the rubber bands retaining the mounting block and Jetex 100 clip. Add the fuselage sides and fit a small celluloid wheel in the recess. Cement former *A* very firmly in place. The " cabin " is covered with cellophane and for the semi-scale fans (of whom I am one) a profile pilot can be added and painted with poster colours. Complete by adding the wing mounts, seating strips and dowels. Give one coat of clear dope and colour-trim to taste.

FULL SIZE WORKING DRAWINGS ARE OBTAINABLE FROM YOUR LOCAL DEALER, OR BY POST FROM THE " MODEL AIRCRAFT " PLANS DEPARTMENT, 23, GREAT QUEEN ST., LONDON, W.C.2. 2s. 9d. POST FREE.

Engine Mounting

The engine mounting block and clip fit into a recess on the fuselage. Care should be taken to see that the mounting block is a push fit into this recess. The mounting block and clip is held from movement sideways by two rubber bands. It is important that these bands should be tight and always examined before flying. The complete block and clip can be swung through 90 deg. outwards to enable unit to be loaded.

Wings

The wings are of simple construction and both may be built in a very short space of time. Cut the upper and lower mainspars from ¼ sheet. Build both wings in two halves and then cement together. Sheet in the centre-section of the lower wing. When water-stretching and doping do half a wing at a time and keep pinned to a board to avoid warps. Warping at any time is fatal, and you get double your ordinary ration on a biplane if you are not careful !

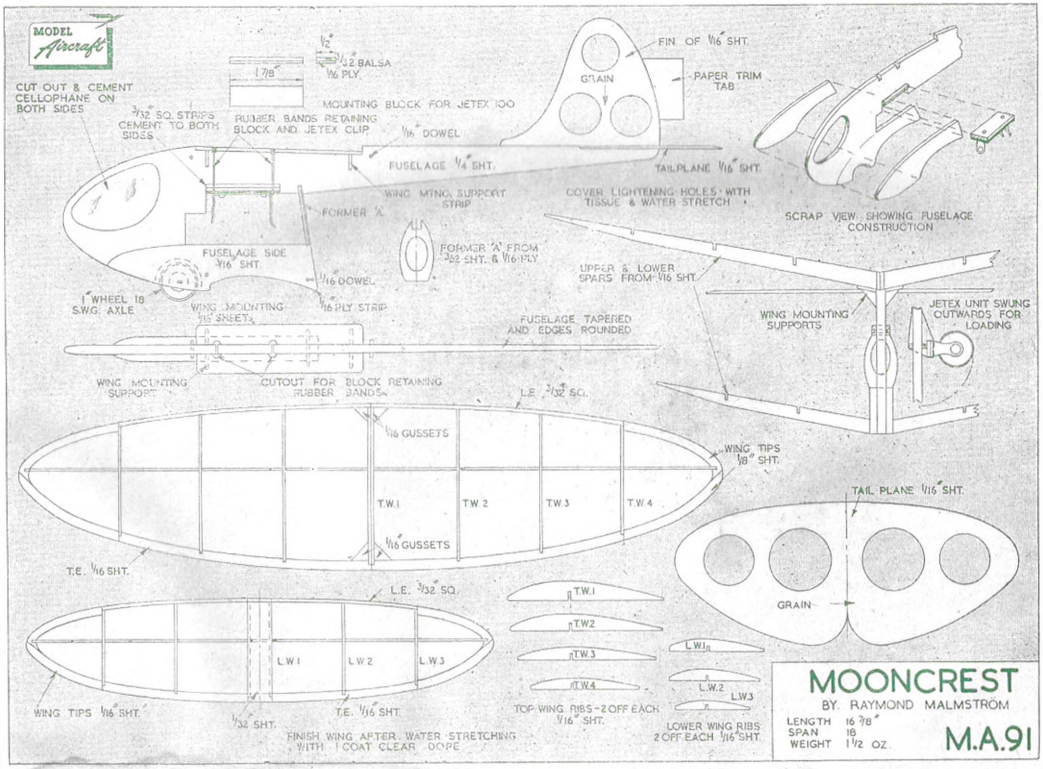
Fin and Tailplane

These are cut from $\frac{1}{16}$-in. sheet suitable lightened. Do *not* dope tail assembly. Cement in place on fuselage and add trim tab. The total all-up weight of the model should be approximtely 1½ oz.

Flying

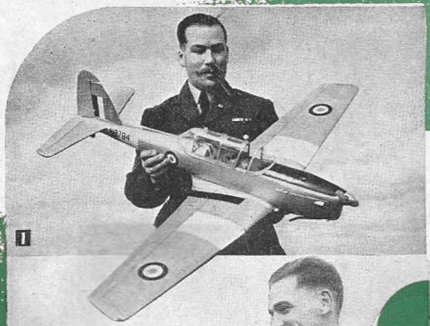
Test as usual over long grass. Alter the incidence angles if necessary to obtain a flat glide. Test glide with the unit *unloaded*. Half charges should be used for the initial tests. If the model stalls slightly under power, insert a *small* amount of downthrust between the fuselage and the mounting block. When the model flies steadily under power and glides into flat landings, pop in a full charge and let it really get upstairs ! The original model climbs in circles to the left.

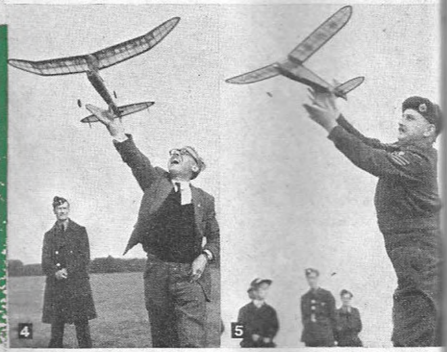
Lastly, the lighter you can build the job the more numerous the number of seconds that will tick off before your model returns to Mother Earth, so sand all parts well before assembly, and go easy with the dope.

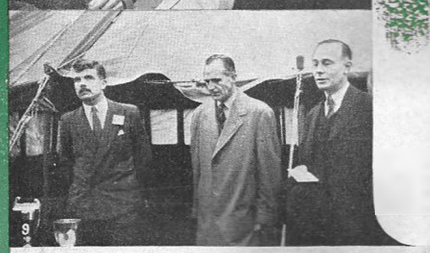

MODEL Aircraft
CUT OUT & CEMENT CELLOPHANE ON BOTH SIDES
3/32 SQ. STRIPS CEMENT TO BOTH SIDES
1 7/8"
1/2"
1/16 PLY.
1/2" SQ. BALSA
MOUNTING BLOCK FOR JETEX 100
RUBBER BANDS RETAINING BLOCK AND JETEX CLIP
1/16" DOWEL
FUSELAGE 1/4" SHT.
WING MTNG. SUPPORT STRIP
FORMER 'A'
FUSELAGE SIDE 1/16" SHT.
1/16" DOWEL
1/16 PLY STRIP
1" WHEEL IB S.W.G. AXLE
WING MOUNTING 1/16" SHEET
FORMER 'A' FROM 3/32 SHT. & 1/16 PLY
WING MOUNTING SUPPORT
CUTOUT FOR BLOCK RETAINING RUBBER BANDS
FUSELAGE TAPERED AND EDGES ROUNDED
L.E. 3/32" SQ.
1/16 GUSSETS
T.W.1
T.W.2
T.W.3
T.W.4
1/16 GUSSETS
T.E. 1/16 SHT.
WING TIPS 1/8" SHT.
L.E. 3/32 SQ.
L.W.1
L.W.2
L.W.3
WING TIPS 1/16 SHT.
1/32 SHT.
T.E. 1/16 SHT.
FINISH WING AFTER WATER STRETCHING WITH 1 COAT CLEAR DOPE
FIN OF 1/16 SHT.
GRAIN
PAPER TRIM TAB
TAILPLANE 1/16 SHT.
COVER LIGHTENING HOLES WITH TISSUE & WATER STRETCH
SCRAP VIEW SHOWING FUSELAGE CONSTRUCTION
UPPER & LOWER SPARS FROM 1/16 SHT.
WING MOUNTING SUPPORTS
JETEX UNIT SWUNG OUTWARDS FOR LOADING
TAIL PLANE 1/16" SHT.
GRAIN
T.W.1
T.W.2
T.W.3
T.W.4
TOP WING RIBS - 2 OFF EACH 1/16" SHT.
L.W.1
L.W.2
L.W.3
LOWER WING RIBS 2 OFF EACH 1/16" SHT.
MOONCREST
BY. RAYMOND MALMSTROM
LENGTH 16 7/8"
SPAN 16
WEIGHT 1 1/2 OZ.
M.A.91

R.A.F. CHAN

The Royal Air Force Model Aircraft Association held its first championship meeting at Halton Aerodrome, Bucks, on Saturday, September 23rd, 1950 and Air Marshal Sir R. Victor Goddard, K.C.B., C.B.E., Air Member for Technical Services, flew from Biggin Hill Aerodrome, Kent, in an Anson aircraft to watch the proceedings and present the prizes. He was received by the Commandant, Air Commodore N. Carter, C.B., D.F.C., and other senior officers, including the president of the association, Air Marshal Sir Hugh P. Lloyd, K.B.E., C.B., M.C.







1. Cpl. N. Barker of R.A.F. Cardington won the Flying Scale class in t
Concours d' Elegance with his fine Chipmunk.
2. A. C. Ross (Maintenance Command) is assisted by F. Lt. Robson befo
placing second in the C/L Stunt event.
3. Two well-known modellers, now in the R.A.F., stop for a chat (le
R. A. Twomey, (right) M. A. King.
4. F/Sgt. Hiorns (Maintenance Command) flying his Power Contest ent
5. F/Sgt. W. Brown (Uxbridge) launching his E.D. " Bee " powered can
model.
6. F Lt. E. T. Ware (Transport Command), winner of the " Model A
craft " Cup with his Mercury " Mallard ".
7. N. Green of Bomber Command (rank unknown) flying in the Pow
Contest.
8. Winner of the C/L Handicap Speed event, F Lt. J. L. Bowmer (Fly
Training Command) receives his prize from Air Marshall Sir Vi
Goddard.

...PIONSHIPS

Each of the Home Commands had previously held eliminating contests and sent the winners and runners up in these to compete in the Championships.

The weather was not too kind—a strong wind making flying rather difficult—but nevertheless, some excellent flights were made and competition was keen for the fine trophies which had been donated. The complete list of results was published in our last issue.

The meeting was well organised, and gave a good send off to what we feel sure will become established as a very popular annual event.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9. W/Cdr. C. F. Pearce, chairman of the R.A.F. Model Aircraft Association, introduces Air Marshal Sir Victor Goddard, K.C.B., C.B.E.

10. Cpl. C. Edwards (R.A.F. Binbrook) with his Mills 1.3 powered Nieuport.

11. F/Lt. J. L. Bowmer, D.F.C., D.F.M., chats with the Air Member for Technical Services, Air Marshal Sir Victor Goddard.

12. Pilot II H. Horsfield (Flying Training Command) flying his own-designed E. D. Comp. Special powered model.

13. F/Lt. N. W. Verney (Fighter Command), member of the Cardiff and Swansea Clubs, with the Victor Ludorum Cup.

14. A Flying Training Command entry—P. W. Read, gets his model away.

15. F/Lt. N. W. Verney of R.A.F. Llandow, S. Wales, launching his "Slicker 50."

16. A. C. Barker (Maintenance Command) winner of the C/L Stunt contest.


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16

THE NEW WAKEFIELD RULES

THE BASIC RULES

- Combined area of the wing and tailplane to be between 263½ and 294½ sq. in. (Wing-tail area defined as per F.A.I. rules, i.e., gross wing-tail area.)
- Minimum value of the maximum fuselage cross section to be 10 sq. in., irrespective of the overall length of the fuselage.
- Minimum total weight to be 8.113 ounces.
- One substitute model shall be allowed, the parts o which may be interchanged with the original model.

POSSIBLE EFFECTS ON DESIGN DISCUSSED

THE main point about the new Wakefield rules is that all existing Wakefields still conform to the specification, with possibly one or two exceptions. Thus your existing model is not necessarily obsolescent. Whether it is at a disadvantage with regard to a new model designed to take full advantage of the new rules is a matter we shall deal with later.

First let us make quite sure that we clearly understand the new wing area dfinition—gross area measurement instead of net area measurement, as under the old rules. Net area includes only the actual area of wing surface. Gross area includes that continuation, or imaginary part, of the wing which may be included in the fuselage—Fig. 1. The same applies to tailplane area definition.

A parasol or normal high wing model is unaffected. The gross wing area is the same as the net wing area—simply the area of the whole wing. But models where the wings plug into the side of the fuselage now have that centre section area included in measuring wing area.

This will eliminate that controversial point as to when the centre section is part of the wing, and when it is not—a feature which disqualified one modeller from the 1950 British Wakefield team. The judges ruled that on the model in question—a high wing cabin monoplane—the centre section fairing he had used constituted wing area and not a definite fairing.

Thus from the point of view of clarity of definition, the new wing (and tail) area rule is to be welcomed. But it would appear immediately to put the plug-in wing model at a disadvantage. One of the main advantages claimed for such "semi-streamliners" is that this centre section is effective as a lifting area. That is, airflow over the fuselage of a well designed

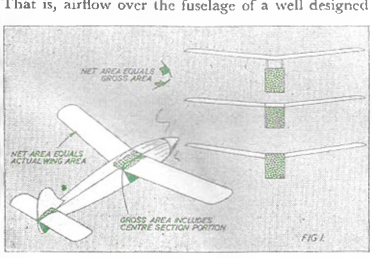


FIG 1

shoulder wing model should be such that the spanwise lift distribution of the wings is continued across this centre section, thus adding to the total lift—Fig. 2. It is possible to get almost 100 per cent.

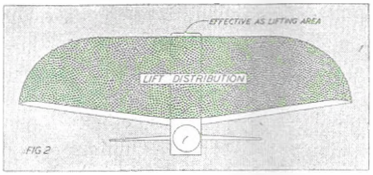


FIG 2

lifting efficiency from this area. Under the new rules, of course, this area counts in any case. Thus the wider the fuselage the more actual or net wing area the plug-in wing model loses. This means, in effect, that the true streamliner with a circular fuselage and mid-wing position loses more net wing area (i.e., has a greater gross wing area under the new definition) than the semi-streamliner with a basic rectangular fuselage. Typical figures are 20 and 25 sq. in., respectively—Fig. 3.

The point is now, is the plug-in wing still a worthwhile proposition? Under the old rules where the net areas were the same, the wings themselves could be built to the same structural weight—or possibly slightly less in the case of tapered plug-in wings. Difference in overall weight was the difference between the shoulder wing fixing and the centre joint(s) in the one-piece high- or parasol-wing (and the parasol mounting in the latter case), the plug-in wing invariably being heavier. This extra weight was compensated for by the increase in actual lifting area.

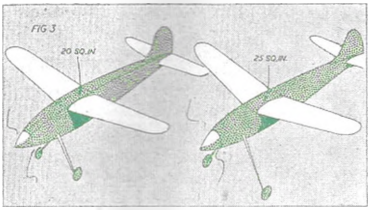
Under the new rules where both wings have to have the same gross area the same conditions hold true. The plug-in type of wing will be heavier, and therefore at a disadvantage. But how much heavier?

Some interesting figures can be quoted as an example of how wing weight tends to increase alarmingly with increasing area. Due to a drafting error, wing planform of Ron Warring's 1949 *Zombie* was laid out to have a bare 202 sq. in. wing area. Wings off this plan weighed a fraction over 1 oz. When the error was found and area boosted to 209.5 sq. in. for 1950, employing identical structure

and, as far as possible, similar materials, wing weight went up to 1¼ oz. A ¼ oz. seems a high price to pay for less than 10 sq. in. of wing area !

It seems fairly safe to assume, however, that every additional 10 sq. in. of wing area added will increase the weight of the wings by about ¼ oz. and so the comparison between the one-piece high- or parasol-wing and the plug-in wing under the new rules is not so flattering to the former as might at first be imagined. We have to bear in mind, too, that the centre section of the plug-in wing is still an effective lifting area under *either* rules !

To get a complete picture, however, we must take the whole of the new rules into account. This puts no limit on tail area proportions, but simply fixes maximum and minimum limits for the *combined*



wing and tailplane areas. We must therefore consider carefully whether the 33 per cent. tailplane area limit fixed under the old rules is still a desirable figure.

The one-third wing area rule for determining tailplane size is only a convenient approximation. Its adoption has largely been due to the fact that rules fixed this size as the *maximum* allowable tailplane area and it is generally accepted that rubber models need a reasonably large tailplane area.

Most rubber model designers, in fact, will tell you that they would prefer to use a tailplane area larger than one-third of the wing area. Where there are no rules limiting tail area this trend has become apparent. Open duration machines generally have tail area boosted to 40 per cent. of the wing, or more.

Optimum tailplane area does, in fact, depend to a very large extent on the design layout of any particular model. If a general rule can apply it would be that the farther aft the centre of gravity position the larger the tailplane area desirable. The smaller the tailplane area the more critical becomes adjustment, and the more likely are slight warps to produce an unwanted change in trim. It would always seem better to err on the side of too large, rather than too small a tailplane.

An attempt to co-relate tailplane area and c.g. position is given in Fig. 4, where a 25 per cent. c.g. position is taken as the absolute forward position where the model is flying with a slight downward lift from the tailplane (and therefore entering the region of inefficient trim, however stable it may be) ; and a 100 per cent. aft c.g. position as the limiting rearward position. This latter is seldom approached for it tends to make adjustment difficult with a variable power output (i.e., counterbalancing the varying torque output of the rubber motor efficiently). These figures may be taken as *minimum* values.

First let us take the case of a typical shoulder-wing semi-streamliner—Fig. 5. Built to the limit of the old rules, net wing area is 210 sq. in. ; tailplane area 70 sq. in. Centre section area is 20 sq. in., so that the actual *gross* area of the wings is 230 sq. in. and the total area 300 sq. in. In other words, the design is already proportioned beyond the limit of the new rules.

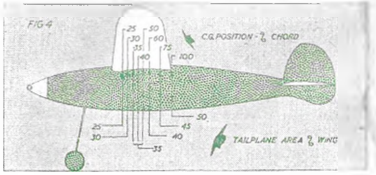
Now the tailplane area is one third of the *net* wing area, but only a fraction over 30 per cent. of the actual lifting area or *gross* area. Aerodynamics takes no notice of competition rules ! For any c.g. position aft of 30 per cent., therefore, we could well afford to increase tailplane area still more, which can now only be done at the expense of reducing the wing area as the total area has still to be on greater than 294.5 sq. in.

Shoulder wing models appear to perform best with a c.g. position of from 35 to 40 per cent. of the chord. Aft c.g. location on such a layout can often lead to trouble, tricky to trim and often very difficult to adjust for a really good, slow glide, with minimum sinking speed. Even so, we see from Fig. 4 that we could well do with a 35 per cent. tail area and re-adjusted figures would be a 198 sq. in. net wing area and a 76.5 sq. in. tailplane.

In other words, the best shoulder-wing semi-streamliner under the new rules may well have a slightly *smaller* wing, but boosted tail area. This should make possible a slight reduction in overall weight—⅛ oz. saved on the wings, but less than this added in boosting the tailplane area, this being inherently a much lighter structure.

The streamlined mid-wing model is in a slightly different category. Here the same c.g. trimming positions apply, but the centre section area is likely to be greater and it may even be that the existing design—to the old rules—exceeds the new limit for total area. In this case an immediate reduction in net wing area to 200 sq. in. would appear to be called for when the original 70 sq. in. tail is still only 30 per cent. of the gross wing area. Reducing the net wing area to 195 sq. in., would allow a 75 sq. in. in tailplane, equivalent to 33 per cent. of the gross wing area and further reduction in wing area would appear inadvisable. Both the shoulder wing types, therefore, work out with under 200 sq. in. net area wing.

However, these comments apply to *existing* designs.



The new rules also permit a reduction in fuselage cross section, when centre section area can also be reduced accordingly. Area "gained" from this reduction in centre section area can be added to the wings, to preserve the same balance as above, or in the case of the full streamliner can be proportioned between the wing and tailplane to achieve the desirable 35 per cent. tailplane area figure.

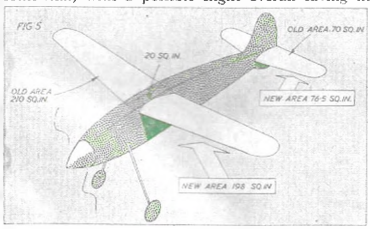
High- and parasol-wing models again represent a different case. Of the two, the parasol wing model is definitely more favoured, whether of the pure parasol type or incorporating a pylon-type fairing on top of the fuselage carrying the wing in the parasol position. Generally, too, these models are rigged with a more aft c.g. position, this being especially true in the case of folding propeller designs.

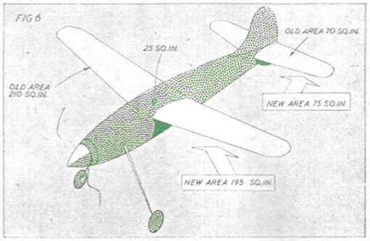
With a folding propeller an aft c.g. position is desirable—if not essential—to achieve a proper balance of trim between power and glide. In fact, almost all successful folding propeller models have two things in common—an aft c.g. position and a parasol wing position.

The biggest difficulty with a folding propeller model is to achieve a good, non-stalling glide. Here a large tailplane is desirable to damp out any tendency to stall which may develop in turbulent air. And to use a large tailplane area efficiently also demands an aft c.g. position so that the tailplane is rigged to carry part of the total load, i.e., contribute towards the total lift generated.

Thus choosing a 60 per cent. c.g. position as typical for this type of model a tailplane area of at least 40 per cent. of the wing is desirable. Within the 294.5 sq. in. total area limit figures then work out to be 212 sq. in. wing area and 82.5 sq. in. tail area. In other words, both wing and tailplane area can be boosted above that typical under the old rules, the tailplane more than the wing. The result should be a definitely improved model. Fig. 7. Of course, using simply a still larger tailplane—90 sq. in. or 45 per cent.—with a normal 200 sq. in. in wing could also be expected to give good results. The main point is that parasol-model designers will undoubtedly take advantage of the new rules to boost tailplane areas, which should be a very desirable feature.

Summarising the probably influence of the new wing-tail area rule. Shoulder wing models may well have slightly *smaller* wings with tailplane area boosted somewhat, with a possible slight overall saving in



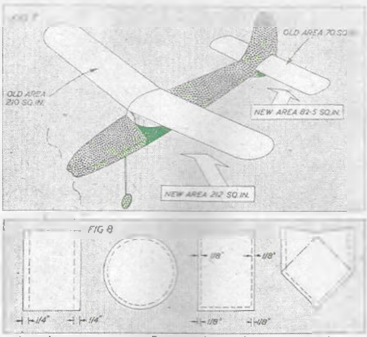


weight. Parasol and high wing models can use larger wings and tailplanes, the latter increase being proportionately greater, with a corresponding slight *increase* in overall weight.

The new fuselage cross section rule does not greatly affect the issue. A good average value for fuselage cross section on orthodox models under the old rules is 12 sq. in. Reduction to 10 sq. in. represents only a small saving, but presumably one which most designers will be keen to take advantage of. Slightly slimmer fuselages, with nose and rear sections remaining the same for adequate rubber clearance. Plug-in wing designers will probably prefer to reduce fuselage *width* proportionately more than depth to reduce centre section area. Other designers will presumably adopt an overall reduction at the maximum cross section station—Fig. 8. A slight overall saving in weight should be possible so that the 1951 semi-streamliner should come out lighter than its 1950 counterpart—the 1951 parasol—or high-wing slabsider very much the same. It should also be noted that the new rules call for a slight *increase* in the minimum weight, 8.113 ounces, as against the previous 8 ounces. One design type on which the new cross-section rule will help is the very long fuselage machine which can now be built without prohibitive weight and drag values.

Thus what at first seemed a rather depressing outlook for the plug-in wing designers does not appear to have turned out so bad after all. Aerodynamically the models should remain very much the same with the slight extra tailplane area that can be used definitely beneficial in trimming out and holding that trim. Other types, however, the parasol- and high-wing models, should show a slight increase in efficiency. There still remains the practical advantage of the plug-in wing machine in that it is generally more robust than a model with a one-piece wing and certainly positive in assembly. However, it is undoubtedly better to stick to one particular layout and go on improving it rather than jump from one type to another in an endeavour to find the best competition model. In the end it is always the way in which you handle the model which counts and experience in knowing what to do—and how that particular design is likely to react—can make all the difference between success and failure.

In laying out your 1951 Wakefield, too, the implications of the 1950 Finals in Finland must be



taken into account. It was there shown possible that a contest could be run in absolutely "dead" air and quite the majority of models taking part were trimmed for normal flying conditions. There is definitely a fine distinction between "dead" air trim and trim for average conditions, also the type of model itself is somewhat different.

For flying in still air conditions one can definitely work down to minimum structural weight and carry the maximum amount of rubber possible. A moderate climb with a very long propeller run, followed by the best possible glide will then give the highest performance. But the same model, with the same trim, flying under rough conditions may not give the same results. Under average British contest conditions a rapid initial climb is always advisable to get the model away quickly and up high, out of the region of ground turbulence. This turbulence may extend up to a height of 200 ft. or more on a day with average wind and the sooner the model is through it, the better. It can often have the effect of turning what may be a perfect still air glide trim into a series of stalls.

Putting all the eggs in one basket, as it were, and producing a high-time still air model and flying it in all conditions may prove disastrous. A 50-50 rubber-airframe weight factor is the minimum necessary, with maximum weight as near as possible down to the 8.113 oz. level. The resulting airframe is generally not as rugged as one would desire for normal contest flying where the eventual landing conditions, often several miles away—are quite unpredictable.

It would seem, therefore, that the approach to serious Wakefield flying—and participation in all the contests—would demand a still-air machine, specially built and flown for those conditions and one, or preferably two, additional machines of somewhat more rugged construction trimmed for their maximum possible performance and use in all contests where weather conditions are less favourable.

The still-air machine would have a 4 oz. airframe and a 4 oz.+ rubber motor. Effective motor run should be in the order of 100 to 120 sec., during which time it should reach at least the equivalent height, and preferably greater height, than the best contemporary Wakefields under still air conditions. Whether this would best be done with a geared drive or a very large diameter propeller is largely a matter of choice.

Drag reduction would be very important, to prolong the glide. Now that Evans has successfully demonstrated a feathering propeller, nothing less than this, or a folder, can be satisfactory for maximum still air performance. This is especially true if propeller size is increased to take care of the larger motor. It would be an individual machine, possibly a full streamliner for the utmost in drag reduction, although if this could only be obtained at the expense of an airframe weight in excess of 4 oz. any possible gain here would be more than offset by the extra weight. Then, finally, it would be trimmed to the absolute limit of performance—a feature lacking in all but Evans's machine of the 1950 British Wakefield team due, probably, in no small part to the lack of opportunities for still air trimming in this country during the past year.

The other two models should then be as near as possible "identical twins" to take full advantage of the third new Wakefield rule which allows you to change various components, if desired. Normally one would fly one machine as the contest model, with the other as reserve. They are bound to work out slightly different in performance however carefully built. But both should be trimmed to their maximum possible performance again and regarded as "expendable," if necessary in order to complete a maximum flight under adverse conditions. Trim would be somewhat different from that of the still air model—tighter power and glide circles so that they would remain in sight for the longest possible period in a strong drift. The still air model would fly more open, even wide, circles.

Thinking it all over, it means a lot of hard work to tackle the 1951 Wakefield competitions thoroughly!

"Well, you try getting an import licence for reindeer!"

JETEX POWERED HELICOPTERS

● Designer, Harold Figgins, prepares the "350" "Jeticopter" for one of its realistic flights at the recent Jetex finals at Fairlop Aerodrome.

MODELLERS who attended the last Northern Heights Gala will remember an interesting twin Jetex 100 powered model which flew in the helicopter event. Duration was only around the half minute mark (Jimmy Tangney won the contest, and also set up a new record with his second flight time of 2 : 43), but in contrast to the average rubber powered model, the Jetex entry featured remarkably steady flying qualities. The Jetex manufacturers have been working on similiar models for some years now, and after much experiment have finally developed a design which is efficient and fool-proof enough to be produced in kit form. First public demonstrations of these new designs were given at the 1950 International Jetex Contest and many impressive flights were made with 50, 100 and 350 powered models.

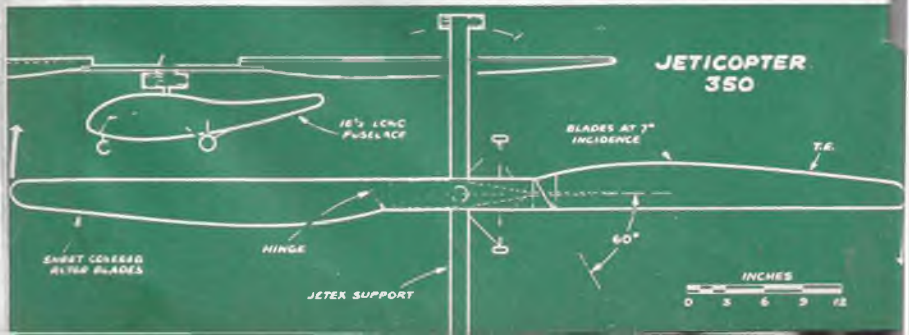
Basically these models consist of two built up rotor blades, with a flat ply support attached at right-angles to the rotor centre section. This support measures about 40 per cent. of the rotor diameter, and the Jetex motors are mounted at each end. A lightweight scale type fuselage is suspended underneath, being free to weathercock into wind. The weight of the fuselage is equally distributed on either side of the pivot point. Rate of climb is quite rapid, and the descent slow and perfectly stable—three point landings resulting every time.

The rotor diameter of the 350 powered model is 70 in., giving a swept area of 3,848 sq. in. The area of each blade is 78 sq. in. Without charges, the weight is 12¾ oz., of which the 350 motors represent 5⅜ oz. The angle of incidence of the rotor blades is 7 deg. and each blade is hinged at 60 deg. (in the top view) to the rotor centre section ; so that when the charges have been expended, the blades are free to take up the correct angle of incidence for the best rate of descent. Under still air conditions, durations of 1¾ min. have been put up. In strong thermal conditions, the model should be capable of maintaining or even increasing height with the rotors windmilling.

It is not intended to produce the 350 design commercially—only the 50 and 100 version. Data on these models are given below :—

JETICOPTERS

	"100" version	"50" version
Rotor diameter	35 in.	23 in.
Blade area (1)	21 sq. in.	9 sq. in.
Swept "	862 sq. in.	415 sq. in.
Weight (less motors)	1½ oz.	9 drams
Average duration	60 sec.	45 sec.



Over the Counter

JUST what classifies a kit as a beginner's model is a purely arbitrary affair. What one manufacturer may list as a "beginner's model" can differ considerably in detail and degree of skill required from a contemporary kit of another manufacturer and in compiling the tables at the end of this article we have been guided by our own opinions as to "beginners' standards." There are no hard and fast rules. An intelligent and reasonably skilful individual might attempt a *Jaguar* for a first-ever model aeroplane, and make a very creditable job of it. On the other hand, a less skilful, and perhaps more impatient youngster could make a mess of even the simplest glider model.

Our own experience is that the simple slabsider is definitely the best type of model for the beginner to tackle. One of the most difficult jobs is then assembling the two sides to complete a reasonably true fuselage structure. If he can build the fuselage then he can almost certainly complete the rest of the airframe. Covering is then the other major problem.

Typical models from the ranges of the leading manufacturers are generally "characteristic." *Frog* models, for example, are the most completely prefabricated of any. Every single sheet part is pre-cut, spar sections are usually shaped and cut to length. Building is mainly a matter of *assembly*. As such they should be ideal for beginners, for the younger members at least usually need considerable practice before they can *accurately* cut out printed sheet parts, but few designs possess the basic simplicity required of a "first" model.

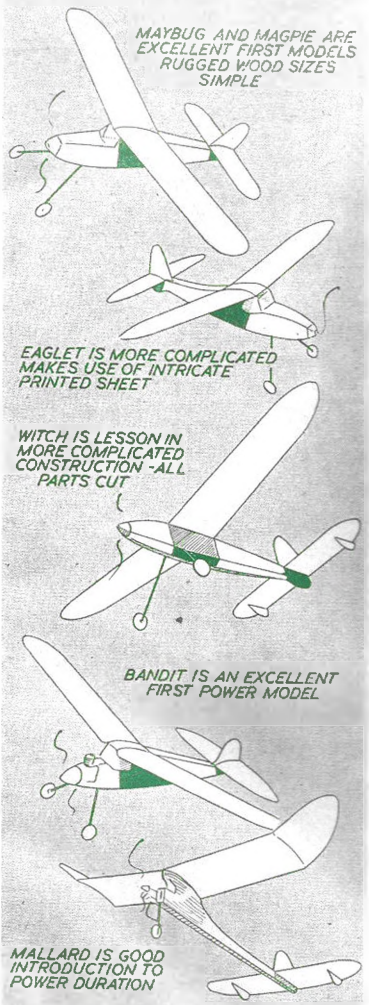
Probably two of the best out-and-out "first" models on the British market are the Mercury *Maybug* and *Magpie*. These have the desirable features of extreme simplicity and rugged wood sizes—the latter an important point where longerons and spacers have to be handled by inexperienced hands for the first time. They also have a particularly comprehensive building instruction leaflet.

Keilkraft models are generally of a more refined design, with attention given to eye-appeal and a good flight performance. They need, possibly, a little more care and attention to construct, but the range is so comprehensive that there is a model to suit everyone's choice. The same remarks apply to Veron kits.

Halfax kit models fall into the intermediate category between the basic types and the models with "appearance," designed primarily as "club" models compromising "duration" ideas with simplicity. The Airyda range tends to simplicity and functional design to produce a "flyable" model, which the beginner can tackle with every hope of success, whilst at the same time the design will also appeal to the more experienced modeller.

All told, then, we are of the opinion that there is no *ideal* absolute basic beginner's model on the market. In fact, it is possibly doubtful that such a kit is desirable at all. It would appeal only to those youngsters of, say, eight to ten years of age tackling their first model. It would have lines similar to the *Maybug* or *Mayfly*, but all parts would be pre-cut. Fuselage assembly would be on a simplified jig, and there would be no sheet-in panels to cut and fit. It would be rugged and have a moderate flying performance. Whether or not this would make it too easy for the youngster is debatable. He will have to get used to cutting out printed sheet parts, so perhaps he might as well start right away with this. There is also some argument in favour of starting with a simple "duration" model—like the Keilkraft *Ajax*, for example, which has a very good flight performance.

The greatest mistake a youngster can make in taking up model-flying is to start in with a com-



plicated and expensive power model. He may complete it successfully, but from then on it will be an expensive way to learn aeromodelling. Even power models have to be trimmed, and learning about trimming more often than not leads to damaged models. The simpler the model the better, at this stage, and we fully endorse the generally accepted opinion that practical experience with the simpler types of model aircraft is the only true foundation for success and enjoyment of the hobby.

A " first " model should be a simple rubber or glider type. Being small and simple it will not be difficult to build.

We do not recommend lingering over the " glider " stage. We regard the small rubber model as the more " flyable," simpler to operate in that it avoids the complexity of towlines, and probably more satisfying to the new enthusiast. Hence a simple " basic " slabsider should be the next step, choosing a kit containing a finished propeller for preference, for this is one item usually well beyond the skill of a beginner.

The rubber model should then be used to acquire a groundwork knowledge of model aircraft, both as regards construction and flying. Still in the small model stage, the next project could be a kit rather more complicated structurally, with sweeping lines and curved wing and tail tip shapes to gain experience in the use of curved (printed) sheet parts and the importance of correct cutting and assembly. One of the more detailed Frog kits would later provide an excellent example of relatively complicated construction, with virtually the whole of the cutting out part already done so that final accuracy depends almost entirely on accuracy of construction. Once capable of dealing successfully with such a machine, and having built up flying experience with the previous models, one of the " duration " types of rubber models could be tackled with confidence.

A step into the free-flight power field is the next obvious move. Here the previous building experience will be a great help, but more especially the practical experience of already having *flown* models. Building experience will lead to accuracy of construction, which is important. Power models are, if anything, easier to build than the smaller models, although they may take more time.

A small model should be first choice. A simple, straightforward cabin design which aims only at a moderate performance, i.e., does not use a large and powerful motor. And here we choose the Keilkraft *Bandit* as an excellent example. There are a number of others.

Finally, if power flying appeals, a duration type is the next step and as an example of how to go about this we have chosen the Mercury *Mallard*. This is a definite duration design which can be powered with a number of different motors. Starting with *the smallest size of motor advised* the developing aeromodeller will have a reasonably " safe " power duration machine. Having learnt to handle this successfully the rest is up to him. If he has worked through such a typical range of models he will be well on the way to becoming an accomplished flier.

SELECTED BEGINNERS' KIT MODELS

Compiled up to August, 1950. Whilst every care has been taken to make these tables as complete and accurate as possible, no responsibility can be accepted for errors or omissions therein

GLIDERS

Span (in.)	Name	Manufacturer	Type	Remarks	Price
20	CUB	E. Keil & Co.	Cabin	—	2/6
24	MAGPIE	Mercury Models	Cabin	Square Tips	3/9
24	JEEP	British Model Aircraft	—	—	11/6
26	CORONETTE	Model Aircraft (Bournemouth)	Cabin	Plastic Canopy	3/3
30	FAIRY	International Model A/C	Cabin	All Parts Cut	7/6
30	CADET	E. Keil & Co.	Cabin	Jetex Conversion	4/-
36	DIANA	International Model A/C	Cabin	All Parts Cut	—
36	SOARER BABY	E. Keil & Co.	Cabin	—	5/-
40	GAMMA	Chingford Model Aerodrome	Diamond	—	12/6
40	VANDA	International Model A/C	Cabin	All Parts Cut	9/6
40	INVADER	E. Keil & Co.	Cabin	—	6/6
42	MERLIN	Model Aircraft (Bournemouth)	Cabin	—	8/3
46	VEROSONIC	Model Aircraft (Bournemouth)	Cabin	Plastic Canopy	9/6
48	SOARER MINOR	E. Keil & Co.	Cabin	—	8/-
60	SOARER MAJOR	E. Keil & Co.	Cabin	—	11/6
60	BUZZARD	Model Aircraft (Bournemouth)	Slab	—	13/6

RUBBER-DRIVEN

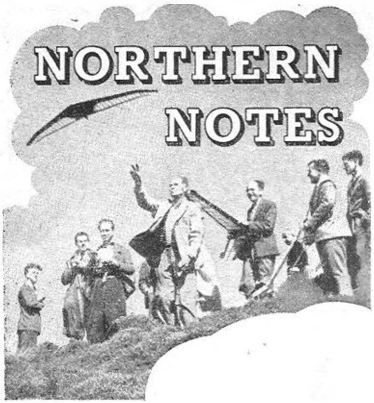
Span (in.)	Name	Manufacturer	Type	Remarks	Price
20	MINOR	Halfax Models	High Wing Slab	Carved Propeller	3/3
20	GNAT I	Model Shop (Newcastle)	Cabin	Plastic Propeller	4/6
20	SNIPE	"	"	Finished Propeller	5/-
20	PLAYBOY	E. Keil & Co.	"	Square Tips	3/3
20	JUNIOR	Modellers Supply	"	Sawcut Propeller	5/-
21	SKYLARK	Model Aircraft (Bournemouth)	High Wing Slab	Sheet Wings tail wcut Propeller	4/6
22	FALCON	British Model Aircraft	—		3/6
24	RASCAL	Model Aircraft (Bournemouth)	Cabin	Square Tips	4/6
24	ACHILLES	E. Keil & Co.	"	Sawcut Propeller	4/-
24	ORION	"	Shoulder	—	3/6
24	EAGLET	"	Cabin	—	4/6
24	SPRITE	International Model A/C	High Wing Slab	All Parts Cut	3/6
—	HAWK	British Model Aircraft	Cabin	Sawcut Propeller	4/6
24	FLEDGELING	Model Aircraft (Bournemouth)	High Wing Slab	Finished Propeller	4/9
24	GOBLIN	International Model A/C	Cabin	All Parts Cut	4/9
26	ALPHA	Chingford Model Aerodrome	Cabin	Finished Propeller	5/6
26	GNAT II	Model Shop (Newcastle)	Cabin	Plastic Propeller	5/6
30	JETEX	E. Keil & Co.	"	Sawcut Propeller	6/-
30	ACE	"	"	—	5/-
30	MAJOR	"	High Wing Slab	Finished Propeller	5/6
30	CAVALIER	British Model Aircraft	—	—	5/6
30	CABIN	Model Shop (Newcastle)	Cabin	Finished Propeller	12/6
31	PYM	Don Models	High Wing Slab	—	6/-
32	MAYBUG	Mercury Models	Cabin	Finished Propeller	7/6
32	SENATOR	E. Keil & Co.	High Wing Slab	Sawcut Propeller	5/6
34	SENTINAL	Model Aircraft (Bournemouth)	Cabin	Finished Propeller	10/-
37	STARDUST	International Model A/C	Parasol	All Parts Cut	10/6
40	GIPSY	E. Keil & Co.	Cabin	Sawcut Propeller	10/6

CONTROL-LINE

Span (in.)	Name	Motor	Manufacturer	Price
16	PHANTOM MITE	Mills .75	E. Keil & Co.	11/6
17	NIPPER	E.D. Bee	Model Aircraft (Bournemouth)	9/6
21	PHANTOM	Mills II	E. Keil & Co.	18/6
22	BEE BUG	E.D. Bee	Model Aircraft (Bournemouth)	11/6
20	COMET	E.D. Bee	British Model Aircraft	11/6
22	RADIUS	Frog 100-160	International Model A/C	17/6
—	RIVAL	Mills II	Don Models	10/6
18	NANCY	"	J's Model Centre	14/6
20	de BOLT BIPE	Frog "500"	Mercury Models	29/6
26	VANDIVER	Frog 100-160	International Model A/C	12/6
27	MAGNETTE	E.D. Comp.	Mercury Models	25/-
28	JUNIOR MUSKETEER	Javelin Mills II	—	14/6
30	MILLS BOMB II	Mills II	Halfax Models	18/6
30	STUNT MASTER	"	E. Keil & Co.	19/6
30	JUNIOR MONITOR	Elfin 2.49	Mercury Models	14/6
30	THUNDERBIRD	E.D. Comp.	British Model Aircraft	17/6

POWER

First Model	Motor	*Intermediate* Model	Motor	*More Advanced* Model	Motor
PIRATE	Mills .75	BANDIT	E.D. Bee	MALLARD	Elfin 2.49
VIXEN	E.D. Bee	OUTLAW	Javelin	HERMES	Mills II
		JUNIOR 60	E.D. Comp.	RAPIER	E.D. Comp.
		SKYSKOOTER	E.D. Bee	SUCKER	Mills II
		VIXEN	Frog 160	STREAKER	Mills II
		MALLARD	1.5-2 c.c.	FOX	Frog 100-160



★ BY THE time the readers of this column (all two of 'em) are perusing these words, it will be very near the time of peace and goodwill and all that, and I had decided for once to fill my pen with the milk of human kindness and not the usual mixture of vinegar and gall. However, I find it once again necessary to start off with a bind (come out the man that said the column is nothing but a bind, anyway) but I will try and make it the only real bind this month. My remarks are addressed to the secretaries of the clubs in the Area, or should I say to some of the secretaries, and I ask them to read, mark, and inwardly digest, one salient fact (perhaps the compositor will be kind enough to put it in large capitals for me)—THE AREA MINUTES AND NEWS SHEETS ARE SENT TO YOU AS THE SECRETARY OF A CLUB, AND IT IS YOUR DUTY TO COMMUNICATE THE CONTENTS TO YOUR FELLOW CLUB MEMBERS. A simple thing, one would think, but apparently we still have with us the odd bod who uses the minutes, etc., for lighting the fire and other such utilitarian purposes. For instance, one club in the Area took the trouble to travel to York in absolutely shocking weather the other week, to attend the Area Championships. That the lack of support for this meeting had caused its cancellation had been communicated to the club sec. in question both in the Area minutes and the News Sheet, but he had seen fit to regard the information as Top Secret, hence the wet, cold, and fruitless journey of his club mates. I bet his ears burned!

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★ CONTRARY TO general expectations the Northern Area Rally did not have the beneficial effect upon the balance sheet this year as has been the case previously. The net profit was only about £4, said profit being so much smaller by virtue of the heavy cost of prizes. The appeal to clubs for donations to the prize list seemed to be a waste of time, only one club subscribing, and, more credit to them, one which rarely figures amongst the prize winners. I think when clubs see the balance sheet this year, they will be in for a bit of a shock; I hear the fluid assets are nothing to be pleased about considering the size of the Area. The proposition, which will by now have gone to the A.G.M., that all clubs should pay a small subscription, according to their membership, sounds a wise one, particularly in view of the fact that one not inconsiderable source of income, namely the fiddle, will dry up next year, unless another fiddler is found. I know our first violin is more than a bit fed up with it, and after hearing some of the cracks made to him about fiddles, I cannot say I really blame him. It seems to be the old story of the more you do the less appreciation you get. So think on, you N.A. lads.

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★ THOSE OF you who can read, and who do not buy this magnificent journal (or pinch the club's free copy) to look at the pretty pictures only, will now know about the new Wakefield rules. We shall now see a flock of pencil bombers with tails as big as wings, full of gears, bursting with rubber, and with all manner of weird and wonderful folding, feathering, tapering, square cut, and pitch varying propellers stuck out in front. Long, loud and terrible will be the arguments between the parasollers and the midwingers and life-long friends will part over the vexed question whether to gear or not to gear, and if turbulators make good mothers. If I might poke my nose in (what does he know, anyway?) I would point out that although the new rules will allow nice long slim fuselages, rubber still needs plenty of room to thresh around in, even more so if you are using twin motors, and strange as it may seem, knots have been known to pile up in the less wider parts of the fuselage, even under the old rules. One serious word if I may. The addition of gears, etc., plus the unlimited fuselage length allowed, is going to cause a bit of trouble when fixing the c.g. in the right place. C. H. Grant laid down some years ago, that for maximum efficiency, the distance between the leading edge and the back of the propeller should *not* exceed two wing chords: a piece of information I have found to be very, very true.

To my mind, the only accessory on the model that has not decidedly improved in the past ten years is the propeller. We still, with one notable exception, cling to our old ideas regarding shape, size and blade areas; can it be that we have reached the ultimate in propeller performance, or would experiment and improvement therein solve our problem? Finally, an illuminating remark from one of our leading fliers, "It looks as if it will be necessary to build two models next year, one of the short and sharp motor run type to qualify for the team under English conditions, and a special type for the comp. proper."

★ WE SHALL know by now, of course, the first winners of the Area Knock-out Trophy, who will have waded through a spate of misunderstandings and arguments on their way to the final round. I would suggest that next year the committee overhaul the rules and make every possible effort to avoid further contretemps. There was a time this year when I thought a special meeting would have to be called to decide the minimum weight of boxing gloves permitted !

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★ FOLLOWING ON my notes of last month. I was quite pleased to hear that the matter of glider tow lines had been brought up at Area Committee level. The attempted use of over-length lines is a *deliberate* attempt to gain an unfair advantage : yet time after time an offender has been caught out and merely told to cut the line to the proper length : the said offender quietly laughing up his sleeve and trying out the same trick at the next meeting and what is more to the point, getting away with it four times out of five. You know, come to think of it, the average acromod is a simple soul : he will stand and look at a glider up on the line, feeling absolutely certain that the line is well over length, and yet, surprisingly enough do nothing about it. Yet if he caught a pal with a couple of spare aces up his sleeve in a friendly game of pontoon, he would probably hand out a thick ear without further ado.

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★ I WISH I could look back down the year and say what a wonderful year the Northern Area had had, how many cups we had won and how well our lads had fared on the International teams. The true picture, unfortunately, is nothing like as rosy, in fact, it seems to have been the worst year ever. Never mind, chaps, there's another year ahead, let's all get together and make a resolution, next year we *will* win some cups and we *will* send some of our boys to Finland.

★ TURNING TO the lighter side of life, I present herewith an explanation of the disappearance from the modelling world of our old friend Len Stott. He has not, as many supposed, given up the art, but has been in secret seclusion working out the details of his latest model, *Flying Fish*. It might be "Frying Fish," since there was an awful lot of crackling on the line when my informant telephoned me, but, however, what is in a name. It is easy to see that this latest model is well up to Len's usual standard and you will note that he still clings to the streamlined fuselage. The wing span is rather small, and it looks as if the tail area is well outside the limits, but nevertheless, I am told that its first and only flight lasted a little over twenty minutes. The stick, or pole, in his left hand is not used for flying the model around, but is, so he informs me, an extremely useful accessory for poking little boys in the ear when they get too close when he is putting on those last few turns. Good luck, Len, the next one you build, send us a slice !

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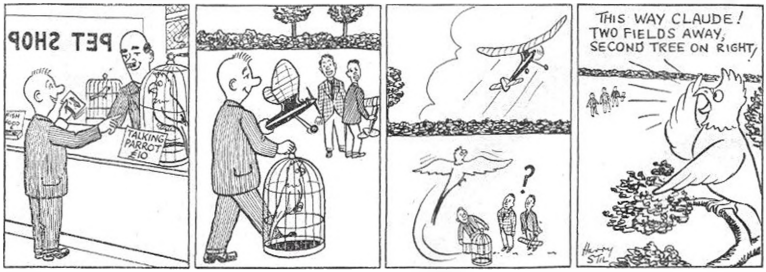
★ FINALLY BEFORE digging out my beard and reindeer, may I wish every one the very best, long flights, no lost mods or broken motors, and bags of beer. I can only hope that I have made a lot of you smile, some of you think, and that the offended ones are in a small minority.

CLUELESS GETS THE BIRD **By Harry Stil**



MODEL *Aircraft*

photonews

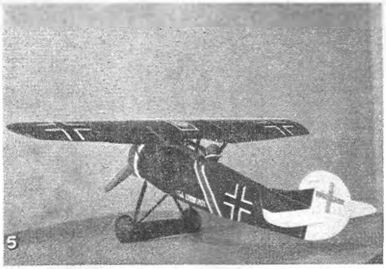
Epsom Downs is a favourite week-end spot with London fliers, and our first picture, which was taken there by K. J. Miller, shows well-known Croydon Club member, Jack North, launching his Arden .199 powered model.

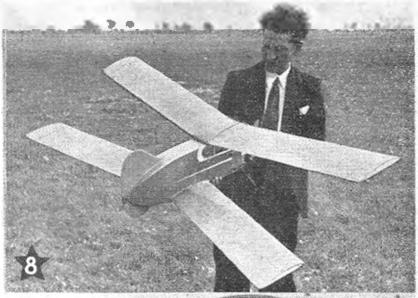
Introducing a little glamour into "Photonews," No. 2 shows Mrs. D. P. Gunter, at the All-Herts Rally, with one of husband Gussie's latest "Clubman" models, this version being powered by an Amco 3.5.

Fliers from fourteen clubs attended this year's North West Rally, organised by the Lancaster and Morecambe M.A.C. Photograph No. 3, which was sent by reader R. F. Garnett, shows a happy group of the prizewinners and officials after an enjoyable meeting which was favoured by one of this year's few good flying days.

The fine model of the *Dornier* 24, which is shown in No. 4, with its owner, J. Bridgewood, of Doncaster, won the scale power event at this year's *Daily Dispatch* Rally, at Woodford. Built to 1/18 in. scale, it is powered by *one* E.D. Bee, weighs 23 oz., and is a most stable performer.

No. 5 shows a 1/12 in. scale *Fokker DV*III free-flight model, by P. L. Gray, of Luton. It is fitted with a 0.87 c.c. Kalper, and has pendulum operated rudder.





D. Salloway, of Rochdale, sent us the next photograph which shows Ernie Currington, of the Prestwich M.A.C., winding up prior to flying in the N.W. Area Wakefield Trials, at Bury, whilst Barry Haisman lights the d/t fuse.

No. 7 was taken by R. A. Adams, of New Eltham, London, at the West Essex Gala, at Fairlop. The speed fan is Alan Indge, of the Zombies Club, and the model is powered by a Hornet Special.

"Photonews" star model of the month is shown in No. 8, with its owner, Gus Payne, who, so the photographer, Ed. Stoffel tells us, has been experimenting with tandem wing models for some time. This latest model has a particularly fast climb and is a reliable performer.

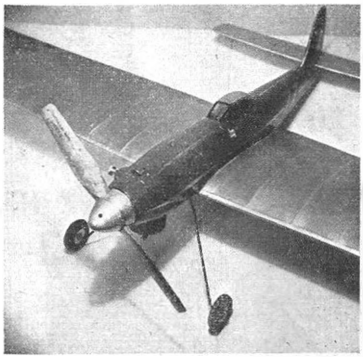
The two lads in summery dress in No. 9 are A. Piacenti (left) and K. Knowles. The former won the C/L stunt event at the Northern Heights Gala Day, with the Amco 3.5 powered *Mercury Monitor*, shown in the photograph, which was taken by J. B. Stewart, of Salisbury.

At this year's Irish Nationals, at Baldonnel Airport, Dublin, the lads from the Belfast Club turned up as usual in strength and photograph No. 10 shows them with some of their models.

Cheerio until next month.

Accent on Power

by **P. G. F. Chinn**



WITH the adoption, at the beginning of the 1950 season, of the S.M.A.E. C/L sub-committee's very sensible "appearance points" rule, the days of rough-looking box-like stunters for serious contest work definitely appeared to be numbered. This has been confirmed by the results of many of the more important stunt contests this season, and all being well, next season should see the virtual elimination of the shoddy contraptions which, in the past, have often been tolerated under the much-abused description of "functional models."

Undoubtedly, British stunt model design has come a long way in quite a short time. Our progress has been far quicker than the Continental countries, and it is probably no exaggeration to suggest that we are, if anything, now slightly in advance of the U.S., particularly in the case of under-5 c.c. engined models. In general, American stunt models have remained unaltered in design over the past two or three years and tend to heavier and bulkier construction than the latest British designs. Of course, from the commencement of C/L flying, the Americans showed a good deal more interest in speed than stunt, hence their great prowess at the former, probably to the detriment of the latter. A similar situation has developed in Continental Europe, where average 5 and 10 c.c. class speeds are higher than those normally reached by British speed models.

Another feature of the 1950 stunt season, has been the wide increase in the popularity of 5 c.c. class models. This, undoubtedly, has been largely due to the good, low-priced 5 c.c. glow-plug engines now available, as well as kits to suit them. Medium and large size models have much to commend them, being smoother in flight and more spectacular and several newcomers to stunt flying have told the writer that they find the larger machines easier to fly than the small jobs. Views probably differ on this point, however, and, since larger models, in general, are bound to be more vulnerable than smaller types, the latter are still the obvious choice for the raw beginner.

For contest work, a powerful 5 c.c. engine, permitting, as it does, a model of around 300 sq. in. wing area, seems to be a suitable choice. Among kit models of this group conforming to the modern stunt formula of a fast, streamlined, semi-scale layout are Henry Nicholls's *Monitor* and *Musketeer*, Bill Dean's *Skystreak-40* and Brian Hewitt's *Stunt Queen* now being kitted by Keil-Kraft.

The latter model is particularly interesting inasmuch as it won the most important British aerobatics competition of 1950 : the Gold Trophy at the Nationals, and represents an interpretation of modern stunt requirements by a designer who, hitherto, has favoured the better type of functional model ; Hewitt, of course, having previously built up an impressive stunt record, including last year's Gold Trophy, with his earlier *Stunt King*. The writer found the model especially interesting also in view of a general similarity to his own 5 c.c. stunt model *Yulupa*, designed late in 1949. Neither of us knew of the existence of each other's models until after the Gold event, but it appears that thinking was along similar lines in regard to what was required of the model and of its general layout, the precise manner in which this would be obtained, however, differing by detailed design. Some general design data for the two models, which shows this, is given in Table 1. The aerodynamic layout of the *Stunt Queen* is shown in the accompanying 3-view drawing and a 3-view of *Yulupa* was given in the July issue of MODEL AIRCRAFT.

Both models, it will be noted, were designed around the Yulon 5 c.c. engine, an early 1949 "30" type

Heading.—Clean lines of "Yulupa's" fuselage are evident in this photograph. Note small air intake on top of the close fitting cowl to ensure adequate air reaching the engine.

(actually one of the first five of these engines built) in the case of *Yulupa* and a 1950 "29" model in the case of the *Stunt Queen*.

Table I. General Data

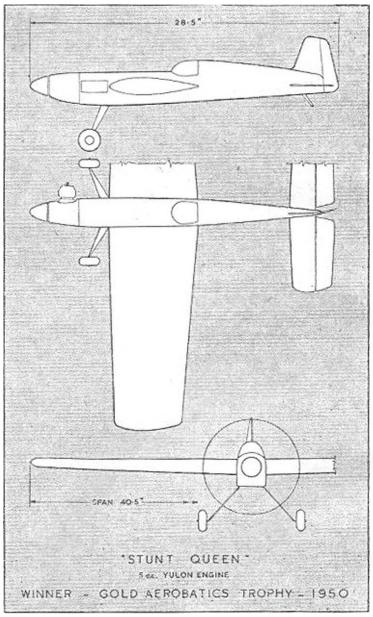
	Stunt Queen	*Yulupa*
DESIGNED BY	B. G. Hewitt	P. G. F. Chinn
BUILT BY	B. G. Hewitt	J. I. Chinn
TYPE	Mid-wing monoplane	Low-wing Monoplane
MAINPLANE		
Area	276 sq. in. (gross: 295 sq. in. approx.)	275 sq. in. (gross)
Span	40.5 in.	40.00 in.
Planform	Tapered L.E. & T.E.	Tapered L.E. & T.E
Chord, root	8.375 in.	8.00 in.
tip	6.375 in.	6.00 in.
Aspect ratio	5.73	5.82
Section	N.A.C.A. 0016 (16%)	Symmetrical 12%
Dihedral	2 degrees	3 degrees
TAILPLANE		
Total area	60 sq. in.	68 sq. in.
= % wing area	20.3%	24.7%
Elevator area	22 sq. in.	30 sq. in.
= % tail area	36.7%	44.1%
Moment arm (C.G. to elevator hinge = X mean chord	18.25 in. 2.47 x mean chord	14 in. 2 x mean chord
Maximum (emergency) elevator movement	25 deg. up and down	40 deg. up and down
UNDERCARRIAGE	Fixed, faired, 2 in. wheels	Fixed, 1½ in. wheels
ENGINE	Yulon 29. (4.87 c.c.)	Yulon 30 (4.95 c.c.)
Installation	Beam. Side mounting	Beam. Inverted
Fuel tank	Balloon	Vented balloon
Airscrew	9 x 6 Truflo or Stant	Own 9 x 6 or Stant
Spinner	Keil 1¾ in. plastic	Keil 1¾ in. alum. screw-on
Fuel	Record-Powerplus	Record-Powerplus
Glow-Plug	Champion V.G.3	K.L.G. Miniglow
RIGGING DATA		
C.G. (relative to mean chord)	15% chord	25% chord
Pivot point (to mean chord)	40% chord	40% chord
Line rake	Nil	2 deg. back
Engine offset	2 deg.	Nil
Fin offset	2 deg. plus 10 deg. rudder	5 deg.
Outer wing weight	¾ ounce	1 ounce
LOADINGS		
Wing	10 oz./sq. ft.	10.7 oz./sq. ft.
Power (approx.)	3.5 lb./h.p.	3.5 lb./h.p.
OVERALL LENGTH	28.5 in.	25 in.
TOTAL WEIGHT	20.5 oz.	20.5 oz.
LINES USED	60-70 ft. (Russell 0.0096 in. 4-strand)	60-70 ft. (P.D.Q. or Light Laystrate).
NORMAL LEVEL FLIGHT SPEED	65 m.p.h.	68-70 m.p.h.
AEROBATIC CAPABILITIES	Full stunt schedule	Full stunt schedule

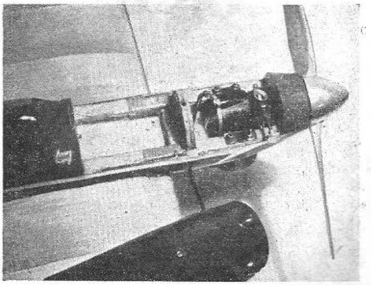
The "30" had previously given a good account of itself in an earlier stunt model, and there was little doubt that Yulons were remarkably well suited to stunt work: their ability to function evenly through C/L manoeuvres being a quality shared by few other motors of similar capacity, and no reason, therefore, was apparent for adopting another type. The engine had, of course, the added attraction of easy starting and light weight which would allow the greatest possible scope in design. At the same time the available power output was quite adequate. No doubt similar arguments influenced Brian Hewitt's choice of a Yulon for the *Stunt Queen*.

With the capabilities of the "30" already known, wing area and weight were quickly decided. A speed of 65 m.p.h. on 60 ft. lines was being aimed at, with a permissible fair weather increase to 70 ft. lines. Since a fixed undercarriage was desired, together with slight line rake and rudder offset, both features which would increase drag and decrease speed, an area of about 275 sq. in. was decided upon. This was also dictated by the requirements of structural strength. Allowing 70-75 per cent. total weight for the finished airframe, an all-up weight of 20-22 oz. was indicated for a finished airframe weight of about 15-oz., a reasonable figure for adequate strength in a model of this size.

For a gross area of 275 sq. in. and an aspect ratio not exceeding 6 (a fair upper limit figure for stunt models) the span and root- and tip-chord conveniently worked out to round figures of 40 in., 8 in. and 6 in. The slight dihedral was incorporated mainly from the point of view of appearance. The tail moment it was decided to keep reasonably short without being excessively so.

A practice which has grown up with stunt models is that of measuring the tail moment from the trailing-edge of the wing, at the root, to the leading-edge of the tailplane at the root, but with the great variation in planform shapes of wings and tails—some tapering sharply on wing trailing-edges and tailplane leading-edges, this method of measurement affords no accurate standard on which to base comparative dimen-





Removable cowling on "Yulupa" gives easy access to engine needle-valve and tank. Balloon type stunt tank is housed in compartment behind engine. Glow-plug is wired to socket between u/c legs.

sions. A better, yet equally simple, system is, in the writer's opinion, to measure the moment arm from the c.g. (from which all moments should in any case be calculated) to the hinge-line of the tailplane. For the moderate to short tail moments currently favoured for stunt models, the figure will then come out at between 1.5 and 2.5 times mean wing chord. For *Yulupa*, 2 × mean chord was chosen, i.e., 14 in.

A tailplane of planform shape to match the mainplane was laid out, area being 68 sq. in., or a fraction under 25 per cent. of the wing area. The elevator area is 44 per cent. of the total tailplane area, or 30 sq. in. No attempt was made to dispose the surfaces symmetrically, the wing being 1 in. below the thrustline, while the tailplane is placed $\frac{3}{4}$ in. above it.

Inevitably, some modifications to the original design were carried out during construction. Principal among these was the elimination of the manoeuvring flaps which, at one stage, it had been decided to try. Another alteration which the builder saw fit to make was the designer's fin shape, for which a nice "Bill-Deanish" outline (albeit somewhat spoilt by an offset rudder) was apparently deemed preferable.

No rush job, the paper work was started on at the end of last season and the model itself finally emerged in May this year.

Brian Hewitt, on the other hand, wasted no time over the design and construction of the *Stunt Queen* Having been persuaded, a bare three weeks before the event was due to take place, to have another crack at the Gold Trophy this year, Brian took three days to get his design on the drawing-board and scheduled his construction over a fortnight. Thus it was that he had only one or two test hops before taking the model to York, while the engine had not been run-in at all.

On the morning of G-Day, while attempting to become better acquainted with the new machine, he had the unenviable experience of the "up" control lead-out tearing out of the paxolin bell-crank he was then using. It says a good deal both for Hewitt's flying skill and for the handling qualities of his model that he was able to bring it down, in a succession of outside loops, with no damage other than to the propeller, and then, despite such a discouraging start, to go on and win the trophy—and by quite a useful margin—although he, himself, dismisses his performance as a "terrible flight"!

Table II. Structural Data

	Stunt Queen	*Yulupa*
Fuselage	Sheet sides. Upper decking planked $\frac{3}{8}$ in. x $\frac{1}{2}$ in. Two plywood nose formers. Whole cowl draws off forward when prop is removed. Retained by two bicycle spoke ends and nipples.	Semi "crutch" basic structure. Plywood nose formers. 1/16 in. balsa planking. Sheet bottom aft of wing. Detachable upper cowling over engine and tank compartment.
Engine bearers ...	Ash, $4\frac{1}{2}$ in. long, into both ply formers. Formers and bearers plastic wood filleted to each other and to fuselage sides.	Ash, 8 in. long, extending well back above wing to strengthen fuselage.
Mainplane ...	Fixed. 1/16 in. sheet leading-edge covering Ribs every 1.8 in. Bellcrank in centre-section.	Fixed. Two tapered spars. Ribs every 1.75 in. Bell-crank in centre section. Silk covering.
Tail Unit ...	Solid $\frac{1}{2}$ in. hard sheet balsa. Split elevators with control horn enclosed within fuselage. Nylon hinges.	Solid $\frac{1}{2}$ in. hard sheet balsa. One-piece elevator with external control horn on lower surface. Nylon hinges. Tissue covered.
Undercarriage ...	12 s.w.g. steel wire. Bound to second ply. bulkhead. Faired with $\frac{1}{2}$ in. sheet balsa attached with cellulose tape. Celluloid wheels.	12 s.w.g. steel wire. Bound to engine bearers. Rubber tyred aluminium hub wheels.
Control system	Enclosed. Flexible lead outs on original with paxolin bell-crank. 14 s.w.g. push rod in two parts. Piano wire elevator horn.	Enclosed. 20 s.w.g. lead outs in wing. 14 s.w.g. push rod. Duralumin bell-crank and elevator-horn.

The general similarity in appearance of the *Stunt Queen* and *Yulupa* are obvious from the photographs. The *Stunt Queen*, however, with its longer tail moment, smaller tail surfaces and bigger fuselage does suggest better scale proportions. It is, of course, a slightly bigger aeroplane all round, although Brian Hewitt succeeded in keeping the weight of the original model remarkably low—only 20.5 oz.—precisely the same as that of *Yulupa*. The layout of the two machines differ in that the *Stunt Queen's* horizontal surfaces are located on the centre-line of the fuselage, for

Team-racer like lines of the "Stunt Queen" Both wing and tail surfaces are positioned on the thrust line.

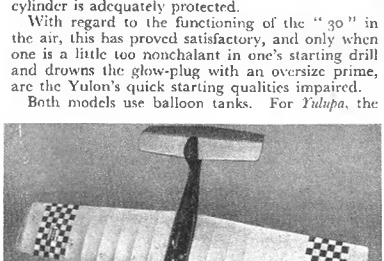
similar flight characteristics upright or inverted, whereas, on *Yulupa*, the wing and tail are located below and above the centre-line respectively. This latter arrangement has no noticeable effect on the inverted flight performance, however ; the model handles equally well through manoeuvres from the inverted and will maintain an absolutely level course in either attitude.

The popular side-mounted engine installation is used for the *Stunt Queen*. The " sidewinder " has become almost universal in Britain, but although originating in the United States, this type of mounting is less popular both in America and Continental Europe, upright installations being more common. Almost unheard of, however, are stunt models with *inverted* engines, and it was not without some protest from the pilot that the designer determined to use the Yulon " 30 " inverted in *Yulupa*. The original intention had been to entirely enclose the engine within a " beard " cowling but with such a short fuselage, this would have given a rather bulky appearance to the nose and so a compromise was eventually reached and the cylinder-head left exposed.

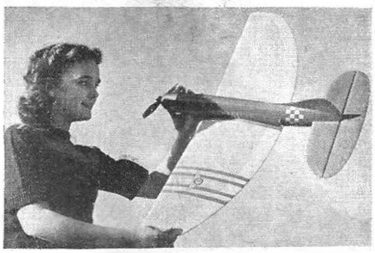
Apart from better appearance, the inverted layout did offer certain practical advantages with this particular design. Firstly, the engine bearers could be extended well back over the top of the wing to strengthen the fuselage at this point and thus permit the whole nose cowling above the centre-line to be made detachable. This completely solved the balloon tank location problem as the balloon would then lie in the ideal position, immediately behind the engine and properly lined up with the jet. Accessibility to both tank and needle-valve was then excellent, while the control stem of the latter was not in the usual vulnerable position on top of the fuselage. The objection to the vertical engine on grounds of vulnerability did not arise as, with the fixed u/c (conveniently anchored to the engine bearers) the cylinder is adequately protected.

With regard to the functioning of the " 30 " in the air, this has proved satisfactory, and only when one is a little too nonchalant in one's starting drill and drowns the glow-plug with an oversize prime, are the Yulon's quick starting qualities impaired.

Both models use balloon tanks. For *Yulupa*, the



Like the " Stunt Queen " " Yulupa " features a fixed undercarriage. Model is finished in red and silver.



The Mercury " Musketeer," designed by Henry J. Nicholls, is a typically modern streamlined, semi-scale stunt model.

" vented " type is used to simplify re-filling. This was first tried out on an earlier model, and was later described in the June issue of MODEL AIRCRAFT.

Of the machines, the *Stunt Queen* appears to be the slightly more robust. Actually, with the more complex structure, and higher flying speed, of the modern streamlined semi-scale stunt model, as opposed to earlier box-car and profile types, more serious damage in crashes is bound to result if wing loadings are kept at similar desirable levels. The modern contest stunter, therefore, is not necessarily the model on which one learns to do vertical eights and then goes on to win a national contest. Better to knock up a fully aerobatic " trainer " and then to build the semi-scale job for the Gold . . . . or, if you prefer to have decent appearance to start with, to resign yourself to building a duplicate for serious contest work. It is not entirely a matter of the semi-scale job being the weaker, as of the scars acquired by any model used for training which may reduce its chances of high " appearance " points in any important stunt contest.

The *Stunt Queen* wing uses a thick section (N.A.C.A. 0016), with the leading-edge sheeted top and bottom, which must obviously provide a stiff structure. *Yulupa* has a section of moderate thickness (12½ per cent.) with two spars running through the ribs and a certain amount of reliance is placed in the doped silk covering to provide adequate rigidity. Both models have lead-out wires running through the ribs and bellcranks are mounted in the centre-sections.

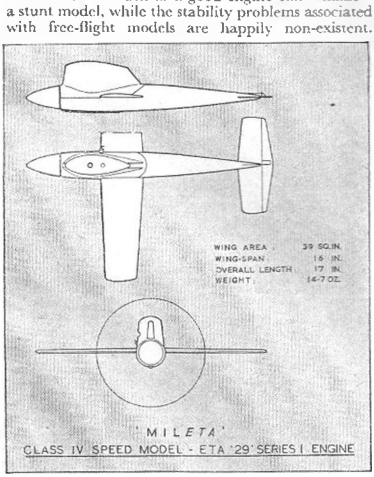
Both fuselages feature balsa planked and sheeted covering over ply and balsa formers. In the *Stunt Queen*, two ply formers are used in the nose section immediately in front of the wing leading-edge and these support the engine bearers and undercarriage. A short one-piece cowl carved from block balsa is fitted ahead of this around the engine crankcase. Plastic wood fillers are used to strengthen the various ply to balsa joints ; ⅛ in. planking is used. *Yulupa's* fuselage features lengthened engine bearers extending well back over the wing, as already mentioned, with two plywood nose formers and the remaining formers assembled on two shaped balsa longitudinals extending to the tail which comprise the fuselage sides

below the centre-line. Above the centre-line the fuselage is planked with $\frac{1}{16}$ in. hard balsa.

Respective rigging is interesting. Both models have a 40 per cent. pivot location, although c.g. locations are different, *Yulupa* balancing closer to the pivot at 25 per cent. Fin offsets are used and are approximately equal, but while the *Stunt Queen* has a 2 deg. engine offset, *Yulupa* uses 2 deg. line rake. Outer wing balance weights are, of course, used. Sum total of these features suggests that the *Stunt Queen* will pull outwards a little more under power, and, also, being the very slightly larger machine, will be slightly slower, assuming the power output of the two engines to be similar. This appears to be the case. Brian Hewitt quotes the speed of his model as 65 m.p.h., while *Yulupa* has returned figures ranging from 64 to 70 m.p.h. on various occasions using Truflo, Truflex and Stant 9 × 8. Stant 9 × 6. 9 × 5, and a homemade 9 × 8. The finer pitch propellers are definitely the best for stunting—the note of the engine hardly changes from that in level flight—and, with these, the Yulon must be approaching very near to its peak output in the air.

The *Stunt Queen* is an undoubted advance in the pursuit of more scalish stunt models in that it closely approaches scale proportions in tail moment length and tail surface areas, while remaining fully capable of all stunt manoeuvres.

In a later article, it is hoped to publish some impressions of precisely how the handling characteristics of the two models differ in the air. It has often been said that "anything" will fly on lines and that almost anything will stunt given enough power and elevator movement. There is a grain of truth here inasmuch as a good engine can "make" a stunt model, while the stability problems associated with free-flight models are happily non-existent.



But that is not to say that stunt model design presents no problems of its own, or that study of these problems cannot be repaid in superior models. The difference between a good and poor stunter can be likened to that between a thoroughbred sports car and a family saloon. Both model and car can be lively yet a pleasure to handle, willing to go where they are directed with precise accuracy, yet safe and manageable in an emergency. And while it is probable that no more than 5 per cent. of those who take up stunt flying can ever hope to achieve national contest standard, the pleasure to be had from handling a thoroughly good model is undoubtedly well worth the effort put into its design and construction.

Boob Department

New type Allbon-Javelin bearing astonishing resemblance to Eta "29" (see heading photograph August "Accent on Power") definitely confirmed as figment of (printer's ? caption-writer's ?) imagination. Model is writer's Eta "29" "MilETA" speed job. Caption referred to Javelin job overleaf.

"MilETA"

"MilETA" was designed and built last winter around the excellent British Eta "29" 5 c.c. racing engine, hence its name. General proportions of the model are shown in the accompanying photograph and 3-view drawing.

The model follows a similar layout to that used in two earlier speed models, and, it will be seen, employs a mid-wing long moment-arm arrangement with circular-section fuselage and a moderate area, lifting-section wing. The structure is mainly of balsa, the fuselage being turned from a hard 2 × 2 block and the wing built on a hardwood spar and covered with $\frac{1}{16}$ in. sheet. Only the front upper portion of the fuselage, with cowling, is detachable. A self-locking drop-out undercart, as used earlier and described in the September article, is employed. (There being nothing new under the sun, N. G. Taylor, British Class 6 record holder, appears to have used the same idea at about the same time.) Sockets for this consist of two screwed bushes locked to the engine mount, the upper ends of these being utilised also to locate spigots on the detachable cowling which then needs only one 6 B.A. screw behind the engine to lock it securely in place.

The bellcrank is unusual in that it is made in two parts and is pivoted above and below the main spar, giving a stronger assembly with no tendency to rock due to line pull. An L-section, or "piano" tank, is used and is positioned immediately behind the spar. Propeller shown in the photograph is $7\frac{1}{2}$ × 10, this being cropped and thinned from an American 8 × 10 "Flo-Torque."

Two design faults have come to light in this model. Firstly, it is almost impossible to utilise the mid-wing layout with a $7\frac{1}{2}$-oz. engine and a light model (under 14-oz.) without resulting in the c.g. being placed too far forward of the pivot point, resulting, in turn, in excessive crabbing and loss of speed. Secondly, in order to obtain the finest possible lines to the cowling, this was built too closely around the cylinder-head and has resulted in blistering of the finish.

SOME INTERESTING FACTS ON

Power Model Propellers

BY J. A. MAXWELL

AS a preliminary to some tests on propellers, which we hope to carry out fairly soon, we have been delving into the reports of previous experimenters in this field, and have dug up some interesting facts. The reports were, of course, intended for use on full size aircraft, but the actual tests had been made with propellers of about 2 ft. diameter, running at very modest speeds (by model engine standards). Thus, from the point of view of Reynolds' Number, the test results are probably more closely

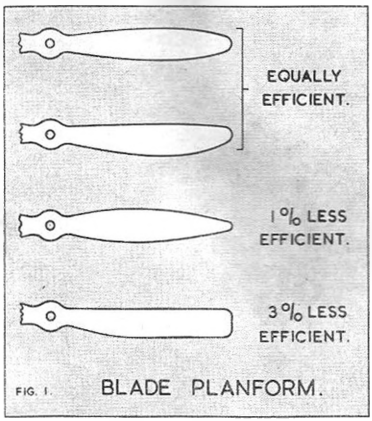


FIG. 1. BLADE PLANFORM.

related to model propellers than to full size. All the reports emanated from such responsible bodies as the R.A.E. and N.A.C.A., and there is therefore no doubt about their being reliable.

The reader will find that nearly all the main facts quoted in this article are completely contradictory to the teachings of Mr. P. R. Payne, in his "Modernised Airscrew Design" series. We mention this as a matter of interest, but make no comment on it, except to say that, personally, we are inclined to be rather old-fashioned as regards propeller design.

Planform

The planform of the blades has only a slight effect on the performance of a propeller. All the

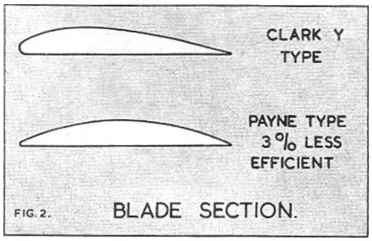


FIG. 2. BLADE SECTION.

conventional curved planforms are about equal in efficiency, but propellers with constant chord blades were found to be 3 per cent. less efficient. Also propellers with unusually sharp tips are slightly less efficient than the more orthodox shapes. (See Fig. 1.)

Blade Width

Narrow blades tend to be more efficient than wide blades. Tests on a family of propellers, all having the same diameter and pitch, showed that the efficiency gradually increased as the blade width decreased. For instance, the efficiency with blade width equal to 1/10 of the diameter was 69 per cent; while with blade width equal to 1/20 of the diameter it was 76 per cent.; or an increase of approximately 10 per cent. The tests also showed that the power coefficients of similar propellers are nearly proportional to their blade widths.

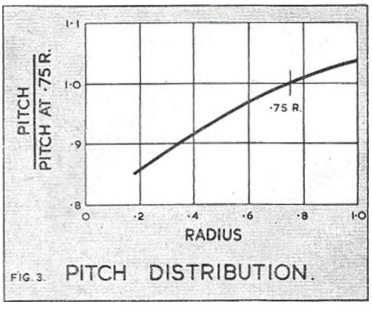


FIG. 3. PITCH DISTRIBUTION.

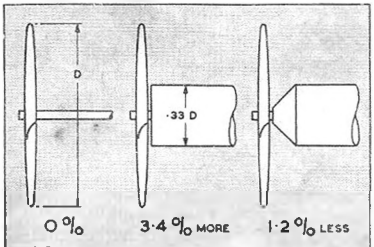


FIG. 4. BODY INTERFERENCE

Taking these two facts together, one finds that narrow blades should normally be associated with high revs. and forward speed. This, no doubt, explains the success of "toothpick" propellers on speed models.

Blade Section

Most of the propellers tested employed blade sections having a flat undersurface and maximum camber at about 30 per cent. of the chord. It was found that any reasonable section of this type was practically as good as, say, an accurate Clark Y.

One propeller had a section with the maximum camber at 50 per cent. of the chord—a section very similar to those recommended by Mr. Payne. This propeller proved to be 3 per cent. less efficient than those with orthodox sections.

The thickness of the section, within reason, has little effect on the characteristics of a propeller, though thin sections are slightly more efficient. A thickness/chord ratio of about $\frac{1}{8}$ appears to be the best compromise between strength and efficiency.

Pitch Distribution

It has sometimes been suggested that the performance of a model propeller might be improved by having a higher pitch at the tip than at the root; that is, washing-in the blades.

Tests prove that there is some justification for this, and Fig. 3 shows approximately how the pitch should be varied for best results. The pitch at 0.75 of the radius is taken as unity. (In fairness to Mr. Payne, we must point out that this is one aspect in which the tests agree with his theory.)

However, the improvement to be gained by deviating from a uniform pitch is not large (roughly 2 to 3 per cent.). The important thing is to have the average pitch right.

Body Interference

The presence of a body or nacelle behind, or in front of a propeller (contrary to what one might expect) increases the efficiency of the propeller. Indeed, it is possible to obtain apparent efficiencies of over 100 per cent. for propellers operating near certain bodies.

This apparent efficiency is, however, misleading because although the body does increase the efficiency of the propeller, the propeller, due to its slipstream, increases the drag of the body. If this increase in drag is deducted from the thrust, one obtains what is known as the "propulsive efficiency," and this is the best criterion for judging propellers in practice.

With bodies of poor aerodynamic shape, the propulsive efficiency may be greater than the efficiency of the propeller alone, but with most reasonably streamlined bodies it is less. Fig. 4 illustrates this point.

Spinners

Spinners are usually fitted with the object of covering up the inefficient part of the propeller near the hub, but this apparently sensible idea is not borne out by the test results.

Fig. 5 shows the effect on propulsive efficiency of a variety of spinners. They all reduce the propulsive efficiency by a considerable amount, but the large "needle nose" spinner is the worst offender. One is therefore forced to the conclusion that on most models a spinner is a doubtful blessing.

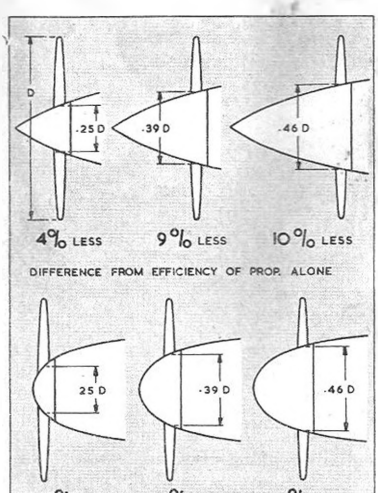


FIG. 5. SPINNERS

French Radio Control Contest

Reported by O. E. HEMSLEY

FOUR members of the Bushy Park Model Flying Club, Messrs. G. Honnest-Redlich, C. F. Earp, R. Goodman and the writer, journeyed to Paris to compete in the Miniwatt International Radio-Control Contest for gliders and power driven models which was held at Cormeilles en Vexin Aerodrome on September 10th.

We left early on Friday the 8th September in our very ancient and heavily laden car in time to embark on the 8.0 a.m. boat from Folkestone to Calais and arrived without incident in Paris at 9.0 p.m.

Saturday morning was spent in endeavouring to arrange for the issue of transmitting licences and trouble was encountered here as the 27.1 m/c band previously allotted for the contest could not apparently be used. However, M. C. Pepin of A.F.A.T. came to our rescue and secured the use of the guard-room on the aerodrome as an impromptu workshop. Honnest-Redlich then got busy and by 10 o'clock in the evening had converted and ironed the bugs out of one transmitter, and three receivers for operation on the 72 m/c band.

After typical continental "discussions" the contest got under way on Sunday morning and a jury of four inspected and checked the equipment in the models, awarding points for design and installation of radio gear, and also for the design and finish of the models themselves. The competition ran very smoothly and the first power model to fly was a very outstanding one by M. Wastable of Moulins. This nicely finished semi-scale model was fitted with very ingeniously designed radio gear, consisting of a four-valve modulated receiver with four spaced delay relays operating rudder and progressive ignition control. The latter was so arranged that in the event of the model flying out of the range of the transmitter, the motor slowly retarded and finally cut off with the rudder in a neutral position.

M. Wastable's take-off technique was quite interesting. First his wife was stationed some distance down the runway with the transmitter, M. Wastable then started the motor and signalled to his wife to operate the advance and retard controls, whilst he adjusted the throttle. When satisfied that the motor was retarded a stick was placed in front of the wheels to act as a chock and then M. Wastable took over the transmitter. On advancing the motor the model over-ran the chocks and took off in a very realistic fashion. Unfortunately after several manoeuvres had been completed the model went out of range, and the safety device mentioned came into action with the result that the model landed undamaged.

G. Honnest-Redlich was the next to fly and despite the fact that he had no left rudder control, managed to put up quite a creditable flight. W. Earp next flew his Forster 29 powered model and although this was his first really controlled flight he completed several spins turns and dives. The model was coming in nicely for a spot landing, when it just failed to clear a car which was parked on the runway. However, the model received less damage than the car and in his best pidgin French he endeavoured to pacify the irate car owner!

In the second round M. Wastable again made a good flight and Honnest-Redlich, who had over-set his rudder trim tab, found that he had very little right turn and could not manage to make the 10 sec. straight flight which would gain him most points. At the close of the second round it was obvious that the winner would be either Wastable or Honnest-Redlich. The latter's last flight was very impressive, and after the model had made a spectacular 15 min. flight ending up with the best spot landing of the day, he received a spontaneous round of cheers from the officials, competitors, and spectators. The final result was: 1st M. Wastable (Moulons) power; 2nd G. Honnest-Redlich (B.P.M.F.C.) power; 3rd M. Poulain (Vichy) glider; 4th C. F. Earp (B.P.M.A.C.) power; 5th O. E. Hemsley (B.P.M.F.C.) power.

The day ended with a dinner at the local inn which was enjoyed by everyone, especially by the one and only French speaking member of our party, (no name no pack drill) whose otherwise near perfect French was reduced to sign language by about midnight!

S.M.A.E News

REPORT OF THE S.M.A.E. COUNCIL MEETING HELD AT LONDONDERRY HOUSE, PARK LANE, LONDON, W.1., ON SATURDAY, OCTOBER 7th, 1950 at 2.30 p.m.

Present: Messrs. A. F. Houlberg (chairman), D. A. Gordon, H. W. Barker, C. S. Rushbrooke, K. J. A. Brookes, H. J. Towner (S. Eastern), S. D. Taylor (London), V. R. Dubery and B. A. Messom (Northern), W. W. Lowery, R. J. Conely, and A. N. Lucas (S. Wales), Flt.-Lt. A. Bradbury (E. Midland), G. S. Bishop (Western), G. Foden (E. Anglia), F. A. Vincent and R. C. F. Day (Southern).

Correspondence

The council were informed that a telegram had been received from the Finnish Aero Club stating that they were prepared to run the 1951 Wakefield Cup Contest, and had advised the F.A.I. to this effect.

The secretary read a letter from Messrs. Percival Marshall and Co. Ltd. (Publishers of MODEL AIRCRAFT), stating that a cheque for £170 12s. 4d. would be forwarded to the society as a donation for its work in connection with the 1950 Model Engineer Exhibition, this sum being the agreed figure of £200, less the cost of cups purchased for the society.

A letter from Messrs. E. Law and Son, Ltd., was read in which they agreed that the trophy, to be known as the Davies Trophy, which they had offered to the society should be allocated for a Team Racing League Championship.

The secretary stated that a good deal of correspondence had been received from clubs concerning action taken by local authorities with regard to model aircraft flying in parks and open spaces. It was decided to again draw the attention of all clubs to the circular sent out by the society some months ago in which it was advised that clubs should approach their local authorities for co-operation without delay and *before* any action was taken by them to restrict or ban model flying.

A letter from the S.E. Area Committee evoked considerable discussion. In it the Area secretary, Mr. H. Rewell stated that the Area had been presented with an account for £200 in respect of the printing of the programmes of the 1950 S.E. Area C/L Championships. As the Area was unable to meet this sum it suggested that the S.M.A.E. or the Kemsley Trust might do so. The matter was deferred until the next council meeting, the chairman undertaking to fully investigate the matter in the meantime. Arising out of the discussion, Mr. B. A. Messom proposed that "No Area Committee shall sponsor any meeting without direct sanction of the council." This proposal was seconded by Mr. F. A. Vincent and carried unanimously.

Area Proposals, etc.

Mr. C. S. Rushbrooke reported the formation of the new West of Scotland Area Committee, and was accorded a vote of thanks for attending the inaugural meeting. The formation of the area was ratified by the council.

Resolution from the Midland Area: "That Rule 7 of the General Competition Rules be modified to read—'Competitors must have constructed the airframe of the machine(s) themselves, except in the case where a model is specifically entered as a club machine, in which case, the air frame must have been constructed by club members only.'" There was no seconder.

Resolution from the Northern Area: "That part of the income from the 1950 Nationals might be passed on to the Northern Area for their efforts in the organisation of the meeting." After it was pointed out that the society had made a loss on the Nationals it was agreed that such action would be impractical.

Resolution from the London Area: "That the engine run in ratio contests be timed to 1/10th sec." There was no seconder to this proposal and it was pointed out that the majority of stop watches only timed to 1/5th sec.

Election of Fellow

The council unanimously decided to recommend to the A.G.M., that Mr. D. A. Gordon be elected a Fellow of the Society.

Finance

The Treasurer presented his report which showed a balance in hand of £1,337 13s. 6d. and was accepted.

The council also decided to consider reducing the prices of badges and transfers.

Date of the Next Council Meeting

It was decided that the next council meeting shall be held on Sunday, November 26th, 1950 at 11.0 a.m.

Wakefield Trophy Model Specifications

The council decided to adopt the alterations to the Wakefield model specifications which had been suggested by the F.A.I. These are as follows: Total area of horizontal surfaces 17-19 sq. d.c.m. Minimum fuselage cross-section area 65 sq. c.m., minimum weight, 230 grams.

Honorary Membership

Mr. Percy E. Chorley (Liaison Officer for the American Academy of Model Aeronautics) was unanimously elected an Honorary Member of the society.

Records

The following records were ratified: A/2 Glider T.L., L. Whittall (Birmingham M.A.C.), 29 min. 51.7 sec.; Rubber-driven Canard, R. Woodhouse (Whitefield M.A.C.), 2 min. 13.1 sec.; Lightweight Rubber-driven, B. J. Williams (Whitefield M.A.C.), 5 min. 15 sec.; Lightweight Glider H.L., J. O'Donnell (Whitefield M.A.C.), 3 min. .01 sec.; Lightweight Tailless Glider H.L., R. A. Faulkner (Whitefield M.A.C.), 1 min. 8.5 sec.; Control-Line Speed, Class IV, F. E. Deudney (West Essex), 107.1 m.p.h. The following record applications were recorded: Tailless Glider T.L., A. R. Lucas (Port Talbot), 22 min. 33.5 sec.; A/2 Glider (H.L., J. R. Done Liverpool), 3 min. 25 sec., 27/8/50; ditto J. G. Joyce (Leeds), 3 min. 40 sec., 10/9/50; Power-driven Tailless, W. Poile (Country member), 2 min. 9.6 sec.; Lightweight Rubber-driven, J. O'Donnell (Whitefield) 7 min. 12 sec. Control-Line Speed, Class I, R. Scott (St. Helens), 80 m.p.h.

Merit Certificates

These were awarded to the following—*Class "B"* No. 208 Exley, C. E. (Sheffield), 213 Walker, F. W. (Sheffield), 250 Johnson, R. J. (Regents Park), 393 Twomey, R. A. (R.A.F. Cottesmore). *Class "A"* No. 420 Greaves, R. H. (South Birmingham), 421 Cole, R. (Ewell), 422 Gilberts, M. H. (Saddlers), 423 Roberts, E. B. (Coventry), 424 Robertson, I. M. (Chorlewood), 425 Bennison, H. (Ipswich), 426 Royle, J. (Littleover), 427 Williams, B. (North Wirrall) 428 Fairgrieve, T. I. (Littleover), 429 Conroy, J. F. (North Wirrall), 430 Ward, S. A. (Ashton), 431 Churcher, C. G. (Streatham) 432 Firth, R. (York).

Applications for Affiliation

Applications from the following clubs were accepted: Broughton & Dist. M.C., Seniors 4, Juniors 4, fee 24s. 6d.; Sheringham & Dist. M.A.C., Seniors 12, Juniors 6, Fee 76s. 6d.; Lewisham Orbit M.A.C., Seniors 6, Juniors 1 ,fee 26s. 6d.

Cranwell Aerodrome

The R.A.F. Association delegate, Flt./Lt. Bradbury, informed the council that the authorities at the R.A.F. College, Cranwell, Lincs., would be pleased to offer facilities for the holding of international and national meetings at that aerodrome. The secretary was instructed to convey to the Commanding Officer the council's thanks for this gesture.

Mr. C. S. Rushbrooke proposed and Mr. B. A. Messom seconded a proposal that "The 1951 Wakefield and A/2 Trials be held at Cranwell Aerodrome." This was carried unanimously.

Contest Results

The proposition from the Southern Area that in future the latest date for the receipt of contest results at Londonderry House should be the first post on the *Saturday* following the contest was passed unanimously.

The meeting terminated at 6.20 p.m. with a vote of thanks to the Chair.

NEWS FROM THE CLUBS

BATH M.A.C.

The club held its Autumn Gala on Sunday September 10th, at Charmy Down, in excellent weather, there was a slight wind, and this resulted in a few lost models in all classes. The club event was won by M. Pocock, second K. Burt, and J. Fry third. The open rubber was won by C. Woods of Bristol West, and two Swindon "bods" Bittles and Greenwood, won the open Power and Glider respectively. In the afternoon a member flew in, in his Auster to give the crowd an added attraction. The Batt brothers produced an R/C *Sun Spot*, which flew very well: Sqd.-Ldr. Ellis pulled a good one too, with a tailless glider powered by a .75 Mills. Tea and refreshments were provided by Mrs Burt and Mrs. Wade. The Red Cross had a collection during the afternoon, and realised over £2. The visitors came from Swindon, Bristol and West, Trowbridge, and Weston-super-Mare. It was a good sight to see the control-liners doing a little bit of free flying.

SOUTHERN CROSS A.C.

Large numbers of large sailplanes were apparent when Southern Cross met Brighton in the second round of an inter-club contest. Strong winds made the flying of rubber and power models hazardous, but good times were put up in the glider section, where F. Boxall of Brighton was first, flying a model of his own design for an aggregate of 511.0 sec. J. M. D. Lane, a junior of Southern Cross, brought out a brand new 9 ft. model to place second, aggregate 480.0 sec. This lad has placed regularly in the first three in all the club's sailplane competitions this year and definitely shows promise.

Almost continuous drizzle and fresh winds did not make the Autumn Area Rally of September 3rd an enjoyable meet. Nevertheless, four "bods" made a flight each to record an aggregate of 736.0 for the "M.E." Contest. By the time these flights were completed visibility was down to 50 yards, and models were going o.o.s., whilst still on the tow-line! However, this performance was sufficient to win for the club the S.E. Area Knock-Out Contest Trophy.

SUNDERLAND AND D.M.A.C.

Ten club members made the 50-mile round trip to Consett to help stage a model display at the Consett Agricultural Show in September. The main event was a C/L stunt contest for the "Baldwin Trophy," premier N.E. Area C/L prize. Our Mr. Revell placed second (to Mr. Wolstenholme of Durham City M.F.C.) in his first entry in an area event. Other members put on a display of streamer-chasing, with a *Vandiver*, *Junior Monitor* and *Bee Bug* in the same circle. Young Gordon Burton made the crowd of some thousands gasp when he converted his biplane into a low-wing monoplane at one fell swoop! Nothing daunted, he flew off again, but found the torque of the Amco 3.5 too great, the model eventually rolling down the lines and chasing him across the field!

The lack of decent weather has thrown attention more on glider and rubber jobs—they don't cost so much when they hit! Two recent incidents show what we are fighting against. First, Les Clark flew his heavyweight *Eros* some ¾ mile downwind and on reaching it, was unable to get back to the launching point in the teeth of the gale. He had to turn the model on its back then go again for it by car! The second—the mystic marking "Enlin" on Geo. Jackson's *Sky Shooter*. We asked him why, and he replied, "It's French for 'At last.' That's because at last, for the first time this summer, I've taken a 'plane home undamaged."

KENTISH NOMADS M.F.C.

With the end of the season now here, the Kentish Nomads would like to place on record how much they have enjoyed the company of other clubs at this year's competitions.

Our first year has brought us a number of successes, among them being J. B. Knight in the Wakefield team, D. Rumley's win of the Junior Championship and Daphne Knight's win of the Ladies Championship.

Our comp. sec., A. G. Russell, was 2nd in the Glider class at Eaton Bray International Week, and J. Howard won the Queen's Cup at Northern Heights' Gala.

We have also won the London Area Keil Trophy for the team of power models. Three of the machines used engines designed and made by our chairman, H. J. Knight. We have also won the Farrow Shield.

SOUTHAMPTON M.A.C.

On September 9th the S.M.A.C. held an engine starting competition. There were nine entries, and the results were: First P. Cock who entered a Weston 3.5 c.c. and managed to start his engine from cold in 18 sec., and when hot, in 7.5 sec. Second was B. Grant who entered a 1.8 c.c. Elfin. He started from cold in 47 sec. and from hot also in 17 sec. B. Leach was third. In obtaining the remarkable time of 7 sec. from hot, Mr. Cock only flicked the propeller over once after filling the tank.

On September 10th, the scale C/L stunt competition was held. There was rather a poor response to this competition as there were only two entries. Results: 1st B. Leach, 104 pts.; 2nd B. Jones 100 pts.

September 24th, the Jetex Duration competition was held. There were nine entries. D. Smith was first, flying a Jetex "100" his time being 135.3 sec. I. Dowsett entered two models, a Jetex "100" and a "50" and these gained second and third places respectively. His time for the "100" was 96.3 sec., and for the "50" 89.0 sec. The low times were due to the extremely bad weather conditions.

Construction and Finish Contest—In this competition, which is open to all, each entrant must bring along his uncovered model for judging on December 8th. All entrants are then required to bring their covered models in January (1951) for the final judging.

LUTON AND DISTRICT M.A.S.

Despite just about the worst and wettest weather we have had for a contest this season, the club made a good all-round showing at the South Midland Area Autumn Rally at Halton.

Dan Baleman obtained a well-deserved first place in the Open Rubber, with Roy Clements running a close second. Trevor Clark proved the value of the large wing area, and lightly loaded power model with a good second place in the free-flight power. If Trev. had had better luck he might have gained a first, his first flight ratio was 20:1 in far from lifting air. Model was a scaled-up *Maillard* with an Amco 3.5 providing the necessary.

Ron Hinks could only manage a fourth in the sailplane, but be at least proved that he had learnt something in Sweden—his fast tow-up was the best of the day—right above his head.

The yo-yo boys got the mill turning in no uncertain manner, and got second and third in a closely fought stunt contest, only five points separating the first three places. We were pleased to see Laurie Glover, who had travelled all the way from Portsmouth, win this event, but this result was reversed a fortnight later when the club stunt maniacs went down to Thorney Island for the Southern Counties Rally, and scooped first place in the stunt in a full gale.

While on the subject of the brick-on-a-string boys, we have noticed that even the most ardent stunt men are building at least one team-racer, although they tell us they will be fully startable as well!

The elbow grease has been flowing freely with the coming of the Luton Ideal Home and Trades Exhibition, where the club made a large entry in the model section. With £50 offered in prizes competition was quite keen, and although we don't yet know the results we should see some awards coming to the club.

Sid Miller was showing his original *Lutonia*, which still displays a finish that looks more like glass than balsa. In the free-flight power section, Geoff. Williams had an interesting looking ETA "29" job to the modern formula, with beautifully cowled engine and laminar flow wing section; Geoff, refused to disclose the exact airfoil.

NORTHERN HEIGHTS M.F.C.

At the invitation of the Bradford club, 11 members of the Northern Heights club set forth on convoy to the North on Saturday, October 7th. Arriving at Bradford we were met by Trevor London. The evening was spent at Silvio Lanfranchi's house and all present will remember his hospitality for many a year. Len Stott's films of the 1948 Wakefield, and the Northern Heights club films were shown and enjoyed. Late that evening the party broke up and we went to our hosts' homes. Sunday morning broke fair and hopes ran high for a good day's flying. We gathered on Baildon Moor, and although the rains came and the winds blew, a single-flight comp. was run off with Ron Mead's 10 ft. glider putting in a flight of 186 sec. to win the contest.

Memories of the past were aroused when one saw Norman Lees and Alec Bell flying Wakefields. Val Turner was flying a *Norseman* and got some good flights off a short line, allowing the wind to do the work of taking the model up. Taking into account the adverse conditions very few models were written off.

Before starting back to town the party sat down to a very welcome hot meal at Ken Race's Cafe and at 5.0 p.m., the convoy set off for London. Thanks Bradford, thanks a lot for a week-end which will long be remembered.

A cheery group of Northern Heights and Bradford club members at the meeting on Baildon Moor which is reported above

NORTHERN AREA COMMITTEE

Model Flying Banned !—But not in Leeds. Why not ? Because Les Mann, Leeds club secretary wrote to the chairman of his local Parks Committee, inviting her to attend a model flying display ; because he made sure he, and his chairman were there, and they prepared their case and talked respectfully, but convincingly, explaining and demonstrating how safe (dangerous) and how quiet (noisy) C/L flying really is. How they recognised that flying must be done *away from private dwellings*, and in an area clearly marked, for safety's sake. Now the Education Committee *and* the Safety Committee *and* the Parks Committee are interested and sympathetic.

What about your club ? The S.M.A.E. are continually getting hard luck letters from clubs asking for help, because the local council has stopped their activities. What is the difference between these and Leeds ? Simply this, Leeds (and Rotherham and a few others, but *only* a few) HAD THEIR SAY FIRST.

Go thou and do likewise, today, for tomorrow may be too late.

Inter-club Knock-out Contest Semi-Finals, Scarborough versus Sheffield.—Nine members of the Sheffield club travelled to Leconfield, and were met after lunch by a coach-load of Scarborough lads, followed shortly afterwards by rain. About 2.30 p.m. the rain stopped and the Sheffield lads rushed out to get some trimming flights in, and see who was likely to do best in the existing conditions before nominating their team. The result was a lot of damage.

The Scarborough team consisted of N. Nye, flying the large glider he had at the September 3rd meeting—a slabsider with tapered square-tipped wings and constant chord centre section and a tailplane mounted on top of the fin. K. P. Jefferson had a large glider on *Sunspot* lines. W. Stork entered his hot power job, an original " wedgy " type similar to the *Jersey Javelin* with high constant chord wings and powered by an Elfin 2.49.

The Sheffield team decided to use A2 gliders, and their team was George Wilkin, Terry Poole and Charles Exley.

Scarborough, undaunted by wind, rain, smashes, and their opponent's 2 min. 5 sec. to their 6 sec., produced Jefferson with *Sunspot* just before 7.0 p.m. Sheffield realising that one good flight could still mean a win for Scarborough, sent out Poole to join him. Unfortunately, although Jefferson made a good tow up to 100 ft. the job then swung to one side and began to come down. It was released but hit the deck fast and broke the fuselage. Poole then decided it was not necessary to fly, and thus the day was won by Sheffield (or should I say George Wilkin ?) He certainly deserves credit for flying successfully in such appalling conditions.

Goole versus West Yorks.—When W. Yorks were drawn away against Goole they had visions of miles of open flat country for their match instead of their home ground of slag heaps, and pot-holes. However, Eric Pyrah, W. Yorks secretary says in his report of the contest that they now know how well-off they really are. Apart from the usual shocking weather they had to contend with a few hundred trees and telephone wires

Towlines snapped like rotting cotton with the effects of the rain, and the strain of high winds. Models were caught in trees and telegraph wires. It took them until 7.0 p.m. to get all nine flights in, and everyone was convinced that it was no competition as there was so much scope for bad luck. The result came out very close, however, with a 47 sec. lead by W. Yorks.

Reminder—December 9th. Area Committee and Delegate Meeting. Church Institute, Albion Place, Leeds.

V. R. DUBERY, P.R.O.

S.E. SUB-AREA CHAMPIONSHIPS

These championships comprised 22 contests (five power ratio, five precision, five rubber, five sailplane and two Jetex) held on five days throughout the season. The *average* wind for these days was 22 m.p.h., only one day being blessed with calm. Rain also made itself evident. Points awarded were, 1st 10, 2nd 8, 3rd 6, 4th 4, 5th 2, one point for an unplaced entry, and five for the best flight of the particular contest.

Final club placings were : 1 Pilgrims, 528 ; 2 Ashford, 167 ; 3 Folkestone, 124 ; 4 Thanet, 24 ; 5 Dover, 21.

Average points scored per entrant were : 1 Pilgrims, 18.9 ; 2 Ashford, 11.1 ; 3 Folkestone, 8.9 ; 4 Thanet, 4.8 ; 5 Dover, 2.6. Average of all entrants was 12.3.

Individual Placings

1	V. E. Smeed	Pilgrims	157
2	E. A. Rigden	.. ..	64
3	J. R. Stainer	.. ..	*53
4	J. Holder	Folkestone	42
5	R. Webb	Ashford	39
6	K. Wenborn	.. ..	35

* Unable to enter all contests.

CHANGES OF SECRETARYSHIPS AND ADDRESSES

Bournemouth M.A.S.—H. F. WELLER, 17, Stillmore Road, West Howe, Bournemouth, Hants.

Crewe & Dist. M.F.C.—C. HOLLOWOOD, 71, Audlem Road, Nantwich, Ches.

Halstead & Dist. M.F.C.—P. HEWITT, 57, London Road, Braintree, Essex.

Winchester M.A.S.—P. H. IVORY, 64, Gordon Avenue, Winchester, Hants.

GLEVUM M.C.

The club visited the Area Autumn Rally at Wroughton Aerodrome, near Swindon on September 3rd.

On arrival the weather greeting us was - - ?.x ! that's right, it was ! Still, we didn't have long to wait for fun.

The Bristol South Club were out in force, and a variety of models were seen as they unloaded. It was here that our fun started, as a team-racer *Shadrach* from the American *Flying-Models* magazine, was soon under way. Flooding the Frog " 500 " it short circuit caught it on fire. A real old blaze it was, despite valiant efforts on the part of the owner to put it out by *squirting fuel* on it ! He finished up with the engine on two bearers in his hands ; *that* engines these " 500s "—ain't they ?!

Fisher was the only member to fly in the coniest -the model, a *Mallard* with a 2.49 Elfin.

A *Southerner* powered by the reliable E.D. 3.46, gave the most impressive sport flying seen, and a well finished model, it put up nearly a dozen flights. The best sight spotted, was the guy in rubber-boots *and* shorts ! Mad-keen some of our modeller friends—or just *mad* !

NORTH-WESTERN AREA COMMITTEE

Here is a chance for those who are unable to get along to area meetings, or who only manage it occasionally, to meet and have a good night out in Manchester.

The N.W. Area is holding its first annual dinner and prize-giving in Manchester on Saturday, December 9th. The venue—the Three Shires Restaurant, Spring Gardens, Manchester. Full details of pre-entry to be announced later.

It is hoped to have the film of the 1950 Wakefield showing, so we look to all N.W. clubs to give this their full support.

The Area would like to have the flying seasons extended to cover the whole year, and, in order to try out this idea, there is to be a winter contest. The proposed date is January 14th, 1951, and the events : rubber, power, glider. Aggregate of three flights to count. Full details will be given in later news sheets.

While on the subject of contests, the Area will be having a fast aeromodellers' week-end in the summer. There will be a big indoor rally (remember how successful it was last year in the Corn Exchange?) on the day before the *Daily Dispatch* Rally at Woodford. Make a note of this for next year's competition programme.

The Area will be supporting the 3rd S.M.A.E. Exhibition to be held in March, 1951. We look to all clubs to support this local event with the best models possible, and also for helpers—stewards to man stands, organise the model display, etc. There is a lot more work to be done this year, and the more help we get makes it a lot easier.

The date is March 16th-18th. Entry forms will be available shortly: entry fee for competition models is 2s. 6d. (includes insurance), models loaned for exhibition do not require entry fees. Final details will be announced as soon as possible.

CARDIFF M.A.C.

After many months of silence the club feels that its light should no longer remain hidden under a bushel, so to speak.

To prove we have a few clues, even in Welsh Wales, the boys managed to lose five out of eight gliders entered in a recent contest, fuse and timer operated D.T.'s proving equally unreliable. This occasion proved beyond all doubt the advantages of large gliders. Peter Persen's 3 ft. job, which took second place, going o.o.s. in 4½ min. whilst the 12 ft. *Thunder King* of Dennis Ridler beat the 10 min. mark.

At the Swansea Club's " Battle of Britain " Rally, M. J. Bennett repeated last year's successes by taking first place in Open Glider with one flight of 2 min. 20 sec., the job being hurled out of sight in a gale. He was flying the Nordic Glider which became notorious during the International Week, taking 6th in the Nordic event after eliminating the opposition with a little dive-bombing.

The club entered the " Bartlett Trophy " event, flown at Bristol in shocking weather on September 24th. Although unable to muster a full team of six for the " Bartlett " itself we took 1st and 2nd in Power-Duration, Peter North and Johnnie Woodhouse getting very wet in the process ! Best flight of the day was 3 min. 6 sec. by Phillips in Open Glider, the model flying like a wet sponge on its subsequent attempts.

NORTH WESTERN CHAMPIONSHIPS, 1950

The C/L events were flown off at Leverhulme Park, Bolton, in rain and wind. " Gig " Eiffaender flew beautifully tow in the Stunt event, but was closely followed by clubmate Ridgeway, and newcomer Pumford from Wallasey. The speed flying was disappointing, except for the efforts of Bailey and Pumford in Classes 1 and II respectively.

The following Sunday the free-flight events took place at Hawarden Airfield, Chester. All entrants held Class " A " Merit Certificates, and as an experiment, scoring was made on the lowest flight of the three. The committee insists that a championship class entrant should be capable of making three good flights, and be in possession of his model at the end of the contest. Unfortunately, the gale force winds which swept the field throughout the day made it difficult to assess fairly the merits of the system.

Yet in spite of the 1950 type weather, the interest of competitors and organisers was maintained from the word go, and not until the last third round flights had been made was it possible to give any results. There was a marathon atmosphere to the whole affair, as three flights had to be made to get any score at all. If a competitor failed to make a flight, then his score for that round was 0 sec., which, being his lowest time, was his score for the contest. Consistency and the ability to control the length of the flight were essential.

Although in the first round D. Bennett clocked 246.5 off much less than the 150 ft. of tow-line allowed, he was out of the running as the model was lost. More spectacular were the Amco 3.5 powered *Super Phoenix* models flown by Lord and Hindle of Accrington. Their starting and release drill was faultless—moving from one side of a large pylon type model to the other while the motor is screaming at top revs. and the wind is trying to tear the wings off is no sinecure, as many competitors discovered at the York Nationals. With the engine run maximum at 10 sec., Lord clocked 145 secs.

In the rubber event, an ancient Evans *Rocket* flown by Frank Dodd of Chester flew with rock steadiness in spite of gusts up to 40 knots. Barry Haisman's canard performed steadily for 94.5 sec. in the first round.

Several competitors holding strong positions at the end of the second round failed to keep it up in the third. Success came to those who had flown cautiously and consistently.

A remarkable piece of repair work was done by Fred Clarke of Bolton, who reassembled the three pieces into which his Wakefield's fuselage had been smashed in the first round, and then improved on his first flight in the last two rounds. The day's flying was a severe test of models and competitors, and all those who completed three flights deserve congratulations.

Permanent awards were made, consisting of small cups, and shields on wooden supports, all with small S.M.A.E. lapel badges let into them. Such awards have proved more popular than medals.

Results :

Control Line

Stunt—1. J. G. Eiffaender (Macclesfield), 350 pts. 2. P. Ridgeway (Macclesfield), 345 pts. 3. T. Pumford (Wallasey), 322 pts.

Speed (Class I)—1. A. Bailey (Comet), 70.0 m.p.h. 2. R. Scott (Comet), 51.5 m.p.h.

Class II—1. T. Pumford (Wallasey), 86.2 m.p.h. 2. J. G. Eiffaender (Macclesfield), 83.0 m.p.h. 3. P. Ridgeway (Macclesfield), 72 m.p.h.

Class III—1. J. G. Eiffaender (Macclesfield). 65.5 m.p.h. 2. P. Ridgeway (Macclesfield), 59.0 m.p.h.

Free-Flight

Rubber—1. R. Woodhouse (Whitefield), 98.2 (305.7). 2. F. Clarke (Bolton), 81.5 (321.5). 3. A. D. Bennett (Prestwich), 39.5 (272.0s.

Power—1. A. Molyneux (Wallasey), 61.8 (225.0). 2. E. Lord (Accrington), 46.1 (245.1). 3. F. Dodd (Chester), 33.1 (115.0).

Glider—1. L. Gabriels (Oldham), 41.8 (171.2). 2. A. Molyneux (Wallasey), 34.1 (140.0). 3. S. Hinds (Wallasey), 23.0 (143.8),

1950 Champion : A. Molyneux (Wallasey)

NOTE.—The lowest time, i.e. the contest score, is given first, with the three flight total in brackets.

WHITEFIELD M.A.C.

There have only been two contests in the past month and as the weather has been poor, little real flying has been done.

H. O'Donnell qualified for the Jetex Finals at Fairlop on September 10th, and his model was proxy flown by brother John ; who was successful in winning the junior prize (which was a very generous cash award). The model was a hurriedly built " 200 " job and flights were 5.21 and 4.95 ratio.

The following day saw the Northern Championships at Harwarden Aerodrome, but only one member, R. Woodhouse, was able to be present. He made up for lack of quantity with quality by winning the Rubber contest. The *worst* of three flights counted as the *score* and he made three very consistent flights of 104, 103, and 98 sec. with a " Prefab " Wakefield.

PRESS SECRETARIES PLEASE NOTE

- **Club reports must reach the Editorial Offices by the 15th of the month.**
- **They should not normally exceed 200 words—preferably less.**
- **If possible they should be typed, otherwise they must be *clearly* written. (Ruled foolscap paper is more suitable for this purpose than club letter headings.)**
- **Type or write on *one* side of the paper only.**
- **Club reports are not primarily intended to furnish information to a club's own members, but to propagate news of general interest to other aeromodellers, such as the details of machines which make outstanding flights, forthcoming open events of general interest, the successful overcoming of club problems, co-operation with local authorities—in fact, information which is likely to be of interest and assistance to members of other clubs.**

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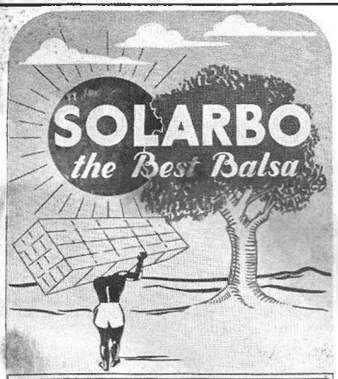

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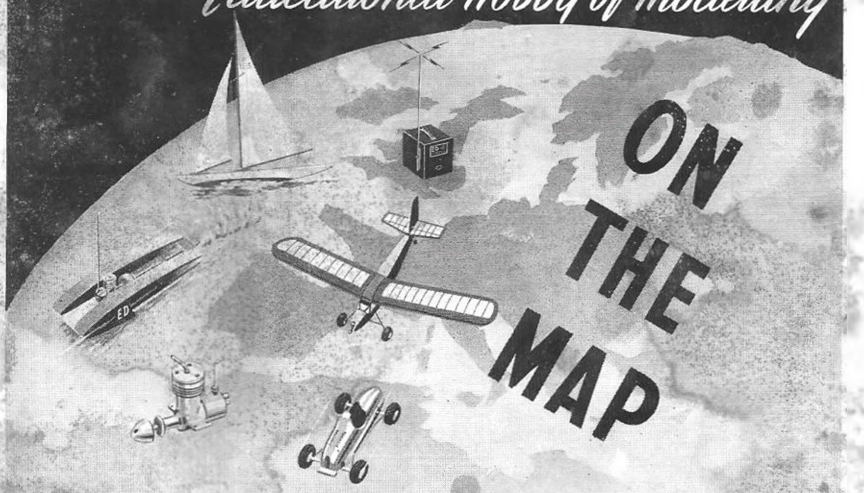

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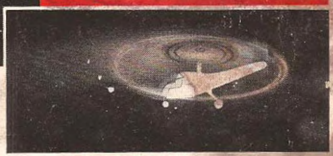

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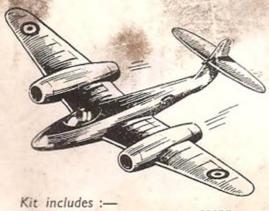

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