MODEL AIRCRAFT

IN THIS ISSUE

MARCH, 1953

1'6

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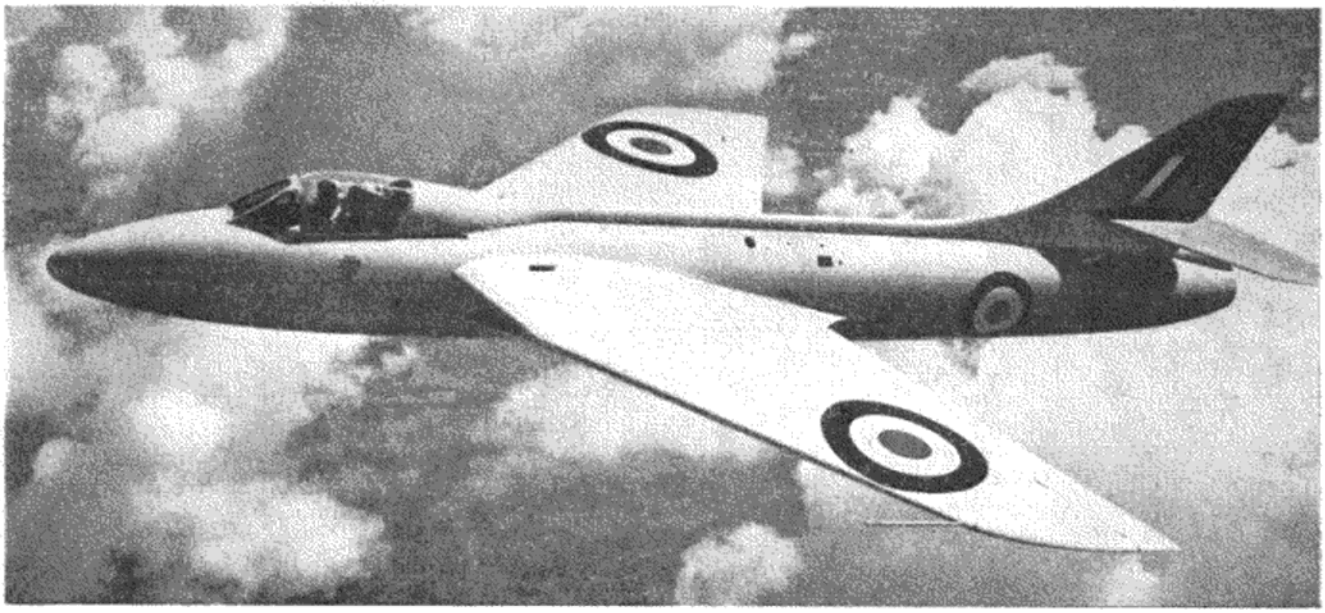

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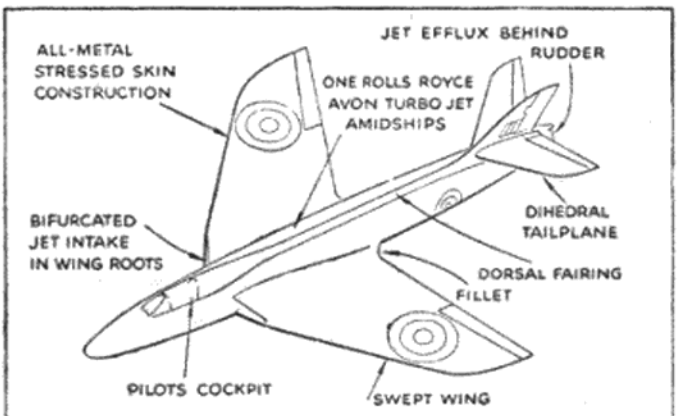

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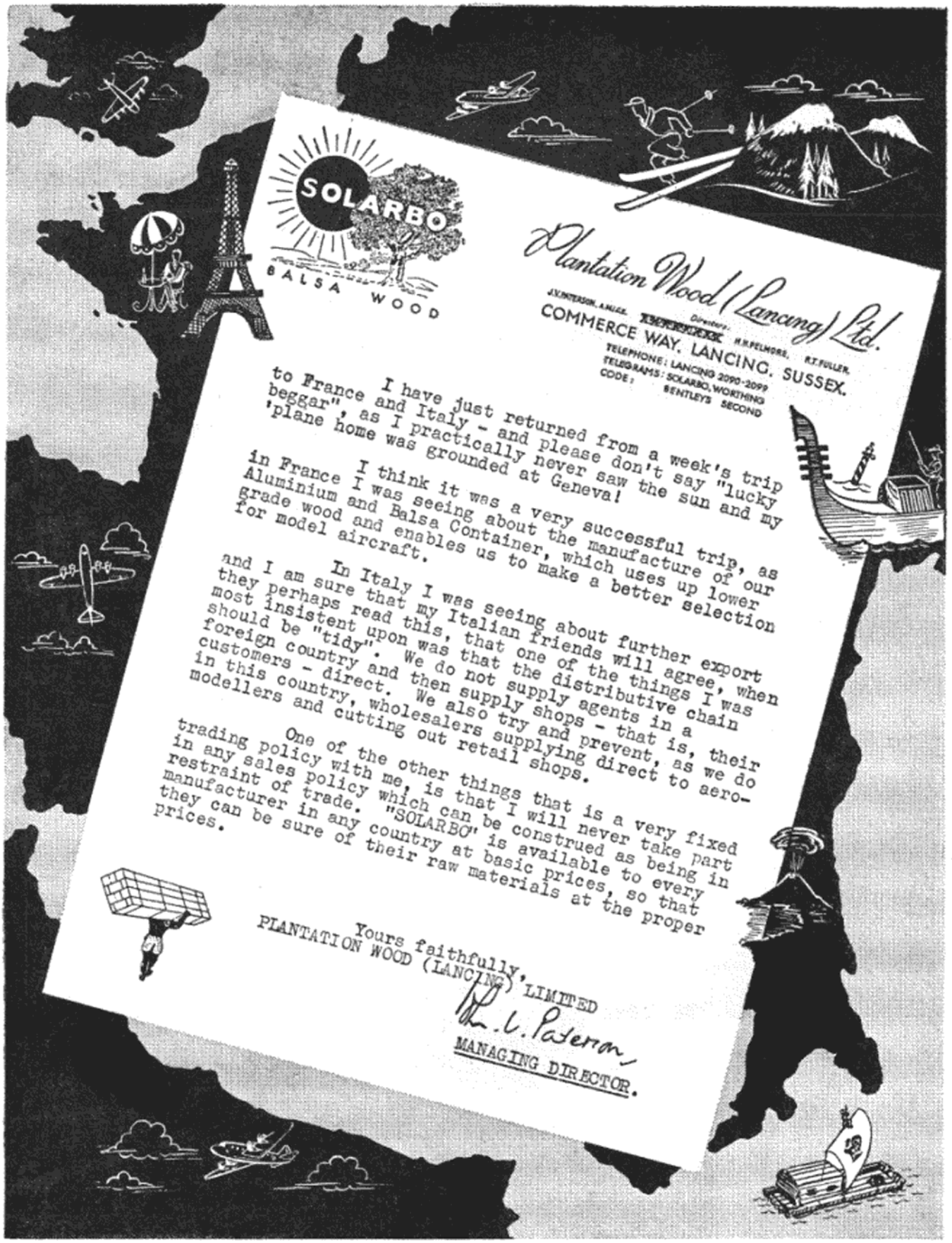

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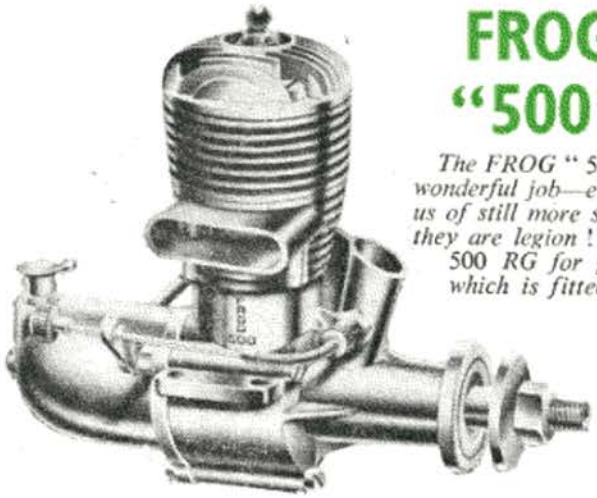

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6 in. × 4 in. ,,	9d.	1/6

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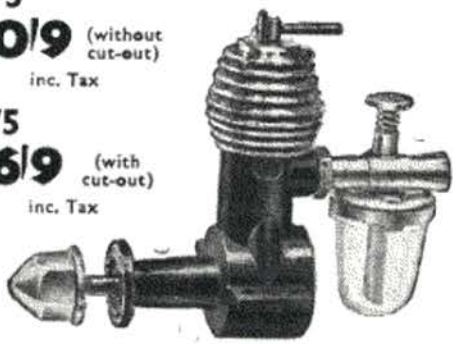

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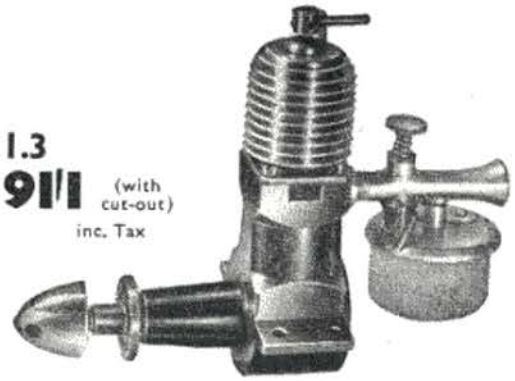

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MARCH 1953 Vol. 12. No. 3.

Contents

EDITORIAL

It seems that the Society of Model Aeronautical Engineers may be soon faced with a crisis as a result of the decision taken at the A.G.M. in November to increase the affiliation fees to 8s. 8d. per annum for seniors and 4s. 4d. for juniors.

Whilst it might have been expected that there would be some repercussions from those clubs that objected to the new fees, it was not apparently anticipated that some clubs would endeavour to evade the issue and affiliate a part only of their membership. We understand, however, that this is what is taking place in some instances, as certain clubs—admittedly only a small number at present—are dividing into a contest flier's section and another "social" section.

If a large number of clubs follow this example the situation will become very serious for the Society, as its income might be even less than it was before the fees were increased.

There is little likelihood that the Council will accept the applications for re-affiliation from the "reconstituted" clubs; to do so would be unfair to those clubs that have accepted in a democratic manner the decision taken at the A.G.M. and have paid the new affiliation fees—even though they do not entirely approve of them. In addition every member of a "contest fliers only club" would have to be issued by the S.M.A.E. with some form of evidence of membership, otherwise there would be no means by which contest organisers would know which *were* affiliated members!

Our personal opinion is that the A.G.M. decision was a most unfortunate one, but the time to express disapproval was at the A.G.M., and those clubs who took no steps to make their views known either by correspondence, proxy vote or attendance at the meeting have now only themselves to blame. All clubs should support the S.M.A.E. and see that the A.G.M. to be held on November 22nd, when the fees will be reconsidered, is a better attended and more representative meeting than the last.

Cover Story

M. Shepherd, of the Epsom M. A. C., specialises in building semi-scale models based on current trends in full-size aircraft. However he was one jump ahead with this one, for he had this four-jet delta completed before the news of the Avro *Vulcan* was released. The model is powered by an E.D. 2.46, is 4 ft. 6 in. long and weighs 3 lb. 12 oz.

THE JOURNAL OF THE SOCIETY OF MODEL AERONAUTICAL ENGINEERS

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Here and There

COMMENTS ON CURRENT TOPICS

INTER-NATIONAL CONTEST PROGRAMME

For a variety of reasons, announcement of the 1953 contest programme has been delayed. In order to give our readers some idea of the main national and international events, and the full impact of certain new rules passed by the F.A.I. Model Committee, at Paris, in December last, we are giving this short, factual summary of what the 1953 contest flier has to prepare for.

First, the world championship events. The power (2.5 c.c. max.) championship is, of course, being run in this country. With the F.N.A. (team Wakefield) also won by us in 1952, the Wakefield itself will also be flown in Britain this year—all three (Wakefield, Power and F.N.A. Cup) being run off at Cranfield on August Bank Holiday week-end (August 1st, 2nd and 3rd). These will be run as normal "daytime" contests—no middle-of-the-night flying this time.

One eliminator only will be held in each of these classes this year and the final teams will be selected from the hundred qualifying for the final trials. To bring the Wakefield into line with other internationals, the 1953 Wakefield team will comprise only *four* members.

Date for Area Eliminators: Wakefield and Power—April 19th.

Date for Trials (probably at Cranfield): Wakefield and Power, June 7th.

The A2 Glider International will be held at Bled, in Yugoslavia, on August 21st-22nd-23rd. The British eliminator for qualification for the final "100" is on March 22nd, and the final *Trials* will be held on May 3rd.

World C/L Championships are to be held at Milan, Italy, at the end of April or beginning of May. *Trials* to select the British team will be held on March 15th. The championship, however, will be based on *speed* only. The F.A.I. Committee have ruled that *one* F.A.I. class only should be adopted each year, in turn. For 1953 this is for 5-10 c.c. motors.

The British Nationals this year will revert to the Whitsun week-end (May 23rd-24th-25th), to be held at an aerodrome in the London area. The rest of the S.M.A.E. contest programme is then to be fitted in around these major dates.

Other international events scheduled for 1953 may be summarised briefly, as under.

C/L.—An international stunt event held at Milan in conjunction with the C/L World Championships. 5 c.c. speed, stunt and team racing at Knokke, Belgium, on July 3rd-6th. Team Racing (2.5 and 5 c.c.) in Holland, September 20th.

R/C.—Power and glider: Brussels, Belgium, September 6th. Southend, England, July 26th (provisional).

Gliders.—Tailless gliders, Bremen, Germany, July 19th. Slope soaring, Trento, Italy, August 15th-16th.

Gliders, 2.5 c.c. Power and C/L.—Madrid, Spain, October 17th-20th.

The "non-championship" internationals will not be supported by teams sponsored by the S.M.A.E. In other words, if British teams do take part, they will be on a "private venture" basis, team members being approved by the S.M.A.E. as of sufficient standard to warrant the title of a "British team" and then paying their own way, like the F.N.A. Cup team of 1952.

There is one more final, and very important point to be digested from the F.A.I. decisions. For 1954 (next year) Wakefields *will be limited to a maximum amount of rubber* equivalent to 80 grammes (2.82 oz.), lubricated. The minimum total weight of the model remains as before at 230 grammes (8.114 oz.).

Now, under the new S.M.A.E. proposals for running the Wakefield Trials, one eliminator is to be run at the end of the previous season (in September) and a second eliminator early in the following year. From the results of these two eliminators the "100" will be selected for the 1954 Trials.

This means, in effect, that, although the new Wakefield rules restricting rubber weight do not come into force until 1954, they are virtually operative from June, 1953, as far as this country is concerned. The Wakefield eliminator run in September of this year will be for Wakefields to the new (restricted rubber) formula. Those 1954 Wakefields, in other words, have got to be in flying trim by September of this year, or the present Wakefields used in this year's trials modified in accordance with the new rules for the September eliminators.

The complete S.M.A.E. programme for 1953 is listed on page 109.

THERE'S NOTHING NEW . . .

Flipping through the pages of some issues of *The Aero* for the year 1910, we recently came across two statements which might well have been made today, and, in fact, *have* recently been made by various authorities. Forty years ago modelling matters occupied a considerable proportion of the "full size" Press and in reports on some of the first meetings of the then current

model aircraft society, we find that :—

One leading modeller of the time (watchmaker, incidentally) stated that gears were beneficial for use with rubber motors, losses in the gears being negligible.

Another expert flier also said that one of the difficulties associated with rubber motors was that during unwinding the centre of gravity of the motor shifted and might cause troubles. This anticipates, by nearly half a century, Ron Warring's theory that the longer the rubber motor, relative to the hook distance between which it is supported, the greater the chance of *the centre of gravity of the rubber motor shifting during flight* and so upsetting the trim of the model.

ON THE MOVE

The Committee appointed to make the arrangements for the Wakefield and International Power World Championships Contest are getting on with the job energetically. A visit has already been made to the Royal Aeronautical College at Cranfield to discuss the questions of accommodation, feeding, etc., of the competitors and officials, and the negotiations are proceeding very satisfactorily—thanks largely to the very co-operative and helpful attitude of the College authorities.

In recent years many of the foreign competitors who came to Cranfield for the 1949 Wakefield contest have told us that it was the best and most enjoyable "Wakefield" held so far. This year's meeting should be even more popular and a large foreign entry for both events is anticipated.

Full details of the contest arrangements will be published as soon as they are available—in the meantime we would mention that accommodation in the College is limited and it is unlikely that there will be any available for British visitors who will not therefore have any access to the College buildings. Special enclosure arrangements are being made for spectators to be admitted on each day by programme, which will be on sale at the gates.

IN TOWN TONIGHT

Going ahead well in advance is the organisation of another important S.M.A.E. event—the annual dinner and prizegiving. It was originally intended to hold it this year out of London, but last year's function was such a success (packed to capacity, in fact) and so many people made a point of writing to the Society saying how much they had enjoyed it, that the Council has changed its mind and decided to hold it again, as before, at the Horse Shoe Hotel, in London. Make a note of the date—Saturday, December 5th.

However, the annual general meeting *will* be held out of London, on November 22nd, possibly at Birmingham. Last year's annual general meeting had such poor support from provincial clubs that it is felt that the change of venue will result in a livelier meeting, more representative of the Society as a national body.

SHAMROCK CORNER

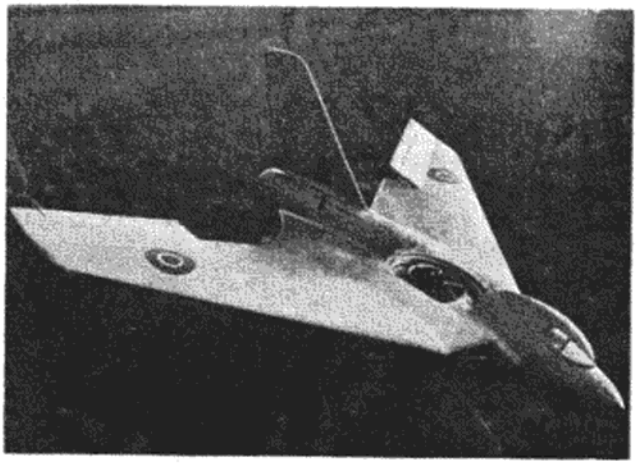
We have recently received copies of a new model aviation publication—*Flying Times*, the journal of the Model Aeronautics Council of Ireland. This is a very well-produced little four-page magazine, printed by the Rotaprint process in two colours. Initially it will be published quarterly at 1s. per year, but if demand warrants it, more frequent issues will be produced. We congratulate the instigators on a fine job, and wish them success in the future.

DUCTED FANS ARE POPULAR

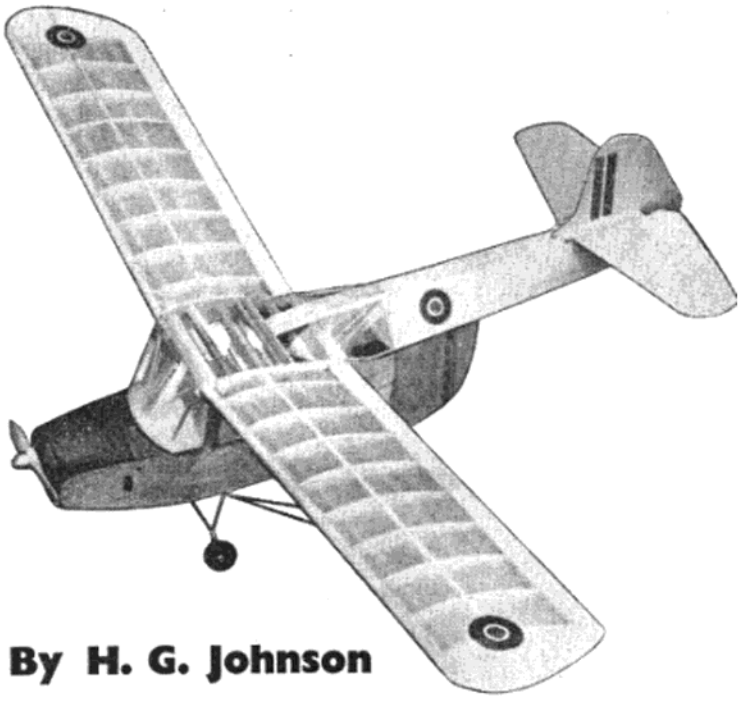
Ever since Phil Smith and Model Aircraft (Bournemouth), Ltd., with the Veron Lavochkin, showed that the ducted fan was a practical method of propulsion, free-lance modellers in various parts of the country have produced successful ducted fan flying scale jet models of an amazing variety of prototypes, including such interesting prototypes as the Gloster Javelin and Boulton Paul delta wing research aircraft.

One of the main problems has been in producing a fan or rotor strong enough to stand up to the extremely high operating r.p.m. necessary with this method of propulsion. Blades cut from dural blanks and twisted to pitch tend to crystallise and break off. Gradually, however, these troubles are being overcome and small diameter rotors for 2.5 c.c. engines are becoming a practical possibility.

A very interesting development of the original "straight through" ducted fan arrangement is where the motor and fan is used in the form of a true centrifugal "blower," with the motor axis mounted at right angles to the axis of the aircraft, rather than in line with it. In other words, the "draught" is produced "vacuum cleaner" style, blowing instead of "sucking." One successful experimenter with this system is J. Coatsworth, of Croydon, and the photograph below shows his prototype design. The blower can be clearly seen, and, driven by an Allbon Dart, produces at least as much thrust as the older layout. A cowling originally covered in the fan, but it was found that this cut down the air intake too much ; however, this will no doubt be sorted out in time



AUSTER AMBULANCE



An interesting scale model of an unusual aircraft— designed for the E.D. "Bee" and particularly adaptable for lightweight radio control

By H. G. Johnson

CUT out formers *A*, *B*, *C*, *D*, *E*, *L* & *X*. Build up formers *N*, *O*, *P*, *Q*, as shown on plan. Cut out base of boom from $\frac{1}{16}$-sheet balsa and top from $\frac{1}{8}$-in. sheet. Note that top extends from former *X* to *E* and is 1 in. wide.

Fuselage

Cut out two sides from $\frac{1}{16}$-sheet over plan, extending from nose former to former *Q* in length and from engine bearer top line across base of windows to former *P*, and then up to top window line. Pin formers *L*, *N*, *O*, *P*, *Q* to building board at correct angle. Cement sides to formers. Instal engine bearers. Make up u/c boxes and instal. Assemble rear u/c fixing and wing brace attachment to $\frac{1}{2}$-in. sq. hard balsa and instal. Cut out top sides *AA* and cement in place to formers, being careful to get correct and equal incidence on each side. Insert two birch dowels across top of fuselage for wing support. Build up top front of cabin with scrap balsa. Insert cross pieces of balsa to strengthen top of cabin where wing fits. Cut out sides of rear cabin from $\frac{1}{16}$-in. sheet and cement to sides at *Q*. Bend round to make smooth curve at rear and cement 1 in. wide strip of balsa at top. Pin base of boom ($\frac{1}{16}$-sheet) to board and mount formers *A* to *E*. When set, cement $\frac{1}{16}$-sheet to form sides of boom and again when set add top piece $\frac{1}{8}$-in. sheet. Sand down smooth and fit small birch pegs for rear fixings. Add small piece of scrap to top of boom for tailplane to butt up to. Cement boom to rest of fuselage, being careful to get correct alignment. Add former *X* and taper boom down to former *O* with a piece of 1 in. wide balsa.

Cut out window side frames from $\frac{1}{16}$-balsa and fit. Cut out small pieces of balsa to wing root shape and attach to fuselage to get tight fit between curved fuselage and wing. Make up top of engine nacelle from scrap laminated $\frac{1}{8}$-in. sheet, sand smooth and fit. Fit $\frac{1}{8}$ in. sq. front pieces to cabin front and top of engine nacelle (see sketch.) Cut out of stiff paper templates for top, sides and front of cabin. Get correct shape by trial and error and when correct cut thin celluloid to same shape and fit to cabin. Drill bearers for engine used and fit, add former *M* made of $\frac{1}{8}$-in. ply. Position depends on engine and type of tank used. Cut top of engine nacelle, fitting to make detachable for engine fitting, refuelling, etc., and drill for engine fuel control. Fuel-proof engine nacelle inside thoroughly and build up nose former with scrap to give streamlined shape. Fit and cement $\frac{1}{8}$-in. sheet hard base to fuselage as far as former *M*. (From here to nose is left open for adjustment to engine.) Make up plug-in type front and rear u/c from 16-gauge wire. Cover fuselage with doped-on white modelspan and colour dope. Fuel-proof fuselage.

Wings

Straightforward. See plan and sketches. Make up wing braces as shown. They are attached to the wings by putting ends through projections on $\frac{1}{16}$-in. ply false ribs cemented to rib No. 7 and retained by soldering small washers. Add 22-gauge hooks numbered on ply as shown and cover with modelspan and dope.

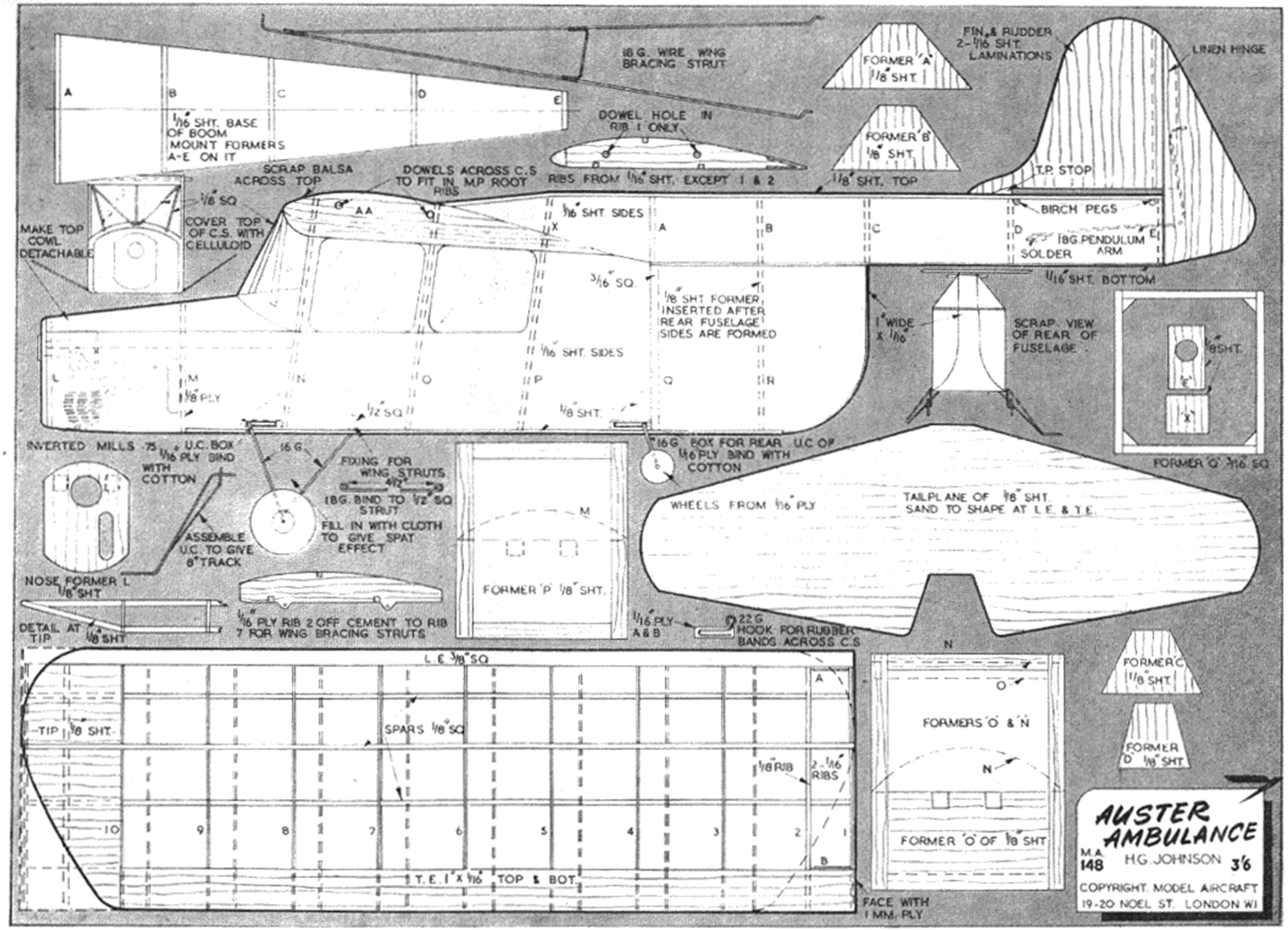
Tail

Cut out as shown and make up ; cover with modelspan and dope. Add solder to pendulum arm so that it is just sufficient to move rudder over. Fin and rudder are cemented to tailplane.

Flying

Model should balance 30 per cent. to 40 per cent. back from L.E. of wing. Try gliding over long grass from low height at first, adjusting tailplane to give correct glide. Note : do not over-elevate. Better to have *slight* dive than stall.

Engine is E.D. Bee with 2 deg. right and 2 deg. downthrust. Start on low power experiment with various props to give scale-like climb and flight.



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F.A.I. REPORT

on the interim meeting of the Model Committee held at Paris, on the 6th and 7th December, 1952

THIS meeting was the best attended of the series so far, representations from the following countries being present:—France, Great Britain, Switzerland, Belgium, Holland, Denmark, Sweden, Spain, Jugo-Slavia.

The director general of the F.A.I., Mr. H. R. Gillman, and the secretary of the committee, M. Guillemard, were also present.

The first business of the meeting was to discuss the international calendar for 1953, and decide on the contests to be sanctioned.

The World and International Championships decided upon have been included in the contest calendar on the facing page.

A discussion on the proposition of Great Britain to limit the teams in all international contests to four and one team manager followed and when put to the vote this was carried unanimously and will apply from January 1st, 1953.

The following items which had been placed on the agenda by various countries were then discussed:

Alterations to the Code Sportif :

(a) The limitation of the weight of rubber (lubricated) on models to the World Championship (Wakefield) formula to a maximum 80 grammes (2.82 oz.). This was proposed by Belgium and carried, and will become applicable on January 1st, 1954. The minimum weight of the complete model will be 230 grammes (8.11 oz.). The weighing will be done in two stages : the first will be the airframe alone, the second will be at the take-off point with the model in full flying order.

(b) The limitation of the length of the launching cable for gliders to " World Championship " formula to a maximum of 50 metres proposed by Belgium was carried for application from January 1st, 1954.
A discussion on the question of cable material resulted in passing of a resolution that cables must not possess an extension exceeding 15 per cent.

(c) A proposition by Belgium that all flights of less than 20 seconds should be considered as attempts was approved by a majority and comes into force on January 1st, 1953.

(d) A proposition tabled by Belgium to limit the power run of the engine on power-driven models to 5-10 sec. instead of the present 10-20 sec. was rejected when put to the vote on the grounds that timers of sufficient accuracy were not at present available.

(e) The proposition by Belgium that it should be stipulated that in the case of a tie the fly-off must take place within one hour of the advertised closing time and that there must not be more than three minutes between the starting times of the models was approved and will come into force from January 1st, 1953.

(f) Belgium also proposed that the R/C rules should be regularised. As a result of the discussion it was agreed that Belgium should prepare a draft set of rules for consideration at the next meeting.

(g) In view of the difficulty of judging the square loop manoeuvres in aerobatic contests Belgium proposed that this figure should be eliminated from the Schedule. This was carried.

The following items were tabled by the secretariat.

(1) Limitation of cylinder capacity to 5 c.c. for Championships in circular flight. The Belgian delegate reminded the meeting of the reasons which gave raise to this proposal in Madrid.
The Committee decided to retain the three categories but in order to ease the situation when deciding the World Championship in circular flight, agreed that one category of cylinder capacity be adopted each year thus in 1953 the Championships will be for Class 3, in 1954 for Class 2, and in 1955 for Class 1, in 1956 Class 3 again and so on.

(2) The question of the allocation of individual and team trophies for the world championship events was raised. A list of allocations was prepared and it was agreed that the secretariat should write to the donors of the trophies for their permission to re-allocation.
Samples of the standard F.A.I. Diploma to be awarded were circulated at the meeting.

(3) The Bureau proposed that the list of world records be reviewed in view of their large number. The director general's proposals were accepted in principle and a new list is to be prepared by the Bureau for circulation to the national aero clubs in good time for the next meeting in May.

(4) The question of rules for team racing contests was raised and it was agreed that a set of rules should be drafted as a result of the experience which will be gained at the Dutch and Belgian contests this year.

(5) The Aero Club of Germany proposed that the maximum time of flight should be reduced to three minutes and the number of flights increased to five. This proposal was agreed by the Committee who decided that the articles in question be amended accordingly and be applied from January 1st, 1954.

(6) The Academy of Model Aeronautics of U.S.A. submitted several propositions concerning C/L speed contests as follows:—
(a) that the diameter of the cables for C/L models should be specified.
This was rejected on the grounds that it does not take into account the specification of the material. It was the-opinion of the

meeting that a test load of 20 times the weight of the model applied to the lines was the only safe method.

(b) that the maximum cross section rule be eliminated. This was rejected.

(c) that the minimum and maximum loadings at present specified should be deleted. The Committee considered the rules satisfactory as they stand and no change is contemplated.

(d) to modify the rule that the model must always remain above the horizontal plane and substitute a maximum flying height of 15 ft. (4.672 m.) for Class 1 and 20 ft. (6.096 m.) for Classes 2 and 3 was defeated.

(e) for timekeeping the Academy proposed the use of three timekeepers with 1/10th second watches and that timing should commence after the model has completed three laps. It also proposed a maximum variation of 2/10th sec. This was considered less satisfactory than the existing rules.

(f) the Academy expressed the opinion that second class watches are an imposition and unnecessary. This was considered together with their proposition that the watches should be given a check over a three hour period before and after the contest with a maximum error of 6 sec., but the committee felt that the Academy was confusing record rules with contest rules and that the two conditions are adequately covered in the present regulations.

(7) Belgium proposed that F.A.I. diplomas should be awarded to all merit certificate classes. This was defeated and only "C" class certificates will qualify for the diploma, as before.

CONTEST CALENDAR

Mar.	8th	**GAMAGE CUP.** Unr. Rubber. Decentralised.
		PILCHER CUP. Unr. Glider. Decentralised.
,,	15th	**INT. C/L SPEED TRIALS.** Centralised.
,,	22nd	Area.
		S.M.A.E. CUP. Int. A2 Eliminator.
		***FARROW SHIELD.** Team Rubber.
		WOMANS CUP. Unr. Rubber and Glider.
April	5th	**"FLIGHT" CUP.** Unr. Rubber. Decentralised.
		HAMLEY TROPHY. Unr. Power. Decentralised.
,,	19th	Area.
		***WESTON CUP.** Wakefield Eliminator.
		***ASTRAL TROPHY.** Int. Power Eliminator.
May	3rd	Centralised.
		INT. A2 TRIALS.
		"AEROMODELLER" R/C TROPHY.
,,	10th	Decentralised.
		LADY SHELLEY CUP. Tailless Models.
		JETEX CUP.
,,	24th-	BRITISH NATIONALS. Centralised.
,,	25th	**THURSTON CUP.** Glider.
		"MODEL AIRCRAFT" TROPHY. Unr. Rubber.
		"GOLD" TROPHY. C/L Stunt.
		SPEED TROPHY. C/L Speed.
		S.M.A.E. TROPHY. Radio Control.
		SIR JOHN SHELLEY CUP. Unr. Power.
		TEAM RACE TROPHY. Class A and B.
		PAA-LOAD TROPHY.
June	7th	Centralised.
		WAKEFIELD TRIALS.
		POWER TRIALS.
,,	21st	Decentralised.
		KEIL TROPHY. Unr. Power.
		FROG JUNIOR CUP. Unr. Rubber/Glider.
July	3rd-6th	**Int. C/L Stunt and Speed.** Knokke, Belgium.
,,	5th	Centralised.
		SUPER SCALE TROPHY. Scale Power.
		BOWDEN TROPHY. Precision Power.
,,	12th	**Northern Heights Gala Day.** Langley.
,,	19th	Decentralised.
		C.M.A. CUP. Unr. Glider.
		FROG SENIOR CUP. 1.5 c.c. Power
		Int. Tailless Glider Contest. Bremen, Germany.
,,	26th	**Int. Radio Control Contest.** Southend.
Aug.	2nd-	WORLD CHAMPIONSHIPS. Cranfield, Beds.
,,	3rd	**WAKEFIELD CUP.**
		F.N.A. CUP.
		POWER CHAMPIONSHIPS.
,,	15th	**WORLD C/L CHAMPIONSHIPS.** Speed/Stunt. Trento, Italy.
,,	21st-23rd	**WORLD A2 GLIDER CHAMPS.** Yugoslavia.
,,	23rd	Radlett, Herts.
		All Britain Rally.
		Int. Jetex Contest.
,,	30th	Centralised.
		AREA CHAMPIONSHIPS. Rubber/Glider/Power.
		TAPLIN TROPHY. Radio Control.
Sept.	6th	*YORKSHIRE EVENING NEWS* **Rally.** Sherburn.
		Int. R/C Contest. Glider/Power. Brussels.
,,	13th	Area.
		GUTTERIDGE TROPHY. 1954 Wakefield Eliminator.
		***"MODEL ENGINEER" CUP.** Team Glider.
,,	20th	**International Team Race.** Holland.
,,	27th	Area.
		***K. & M.A.A. CUP.** 1954 A2 Eliminator.
		HALFAX TROPHY. 1954 Power Eliminator.
Oct.	11th	Ireland.
		U.K. CHALLENGE MATCH. Rubber/Power/Glider.
,,	17th-	Madrid, Spain.
,,	20th	**International Meeting.** Glider, Power, C/L.
,,	18th	Centralised.
		DAVIES TROPHIES. Team Race A and B.
		RIPMAX TROPHY. Radio Control.
		C/L SPEED.

S.M.A.E. CONTESTS IN CAPITALS
*Indicates Plugge Cup Events.

THE "MODEL AIRCRAFT" CONTEST CALENDAR will again be featured in our Club News section during the coming season. Now that the S.M.A.E. Contest Programme has been announced we strongly advise clubs who intend to organise rallies to decide upon the dates of these without delay. Early publication of the dates of these events in the Contest Callendar wil avoid them clashing with other fixtures.

TRENDS in Wakefield design

The 1954 Wakefield will be held under the new rules detailed elsewhere in this issue, so in this article RON WARRING reviews the design aspects prevailing at this year's contest — the last before the Wakefield model begins to look quite a little different.

FOLLOWING new ideas and new trends introduced during the past two or three years, the design of Wakefield models has now more or less standardised itself once more into three basic types or layouts, with the emphasis on functional design rather than improved aerodynamic efficiency. By and large the present day Wakefield is a considerably better duration model than its counterpart of a few years ago. In other words, with possibly a few exceptions, the Wakefield of, say, 1948 would be definitely inferior in performance to the 1952-3 machine—a design advance, incidentally, not reflected by such a marked difference in other types of models over the same period.

Taut or slack?

Broadly speaking, the differences may be summed thus : The main trend has been to get more and more rubber into a Wakefield model in the form of longer motor lengths rather than a greater number of strands. For consistent performance from long motors, greater hook distances, and therefore longer fuselages have been favoured, or the alternative of the return gear system adopted. Many designers, in fact, firmly believe that motors taut between hooks, rather than corded or tensioned by mechanical means, give a superior performance to "slack" motors which need some form of tensioning to maintain a good and consistent glide trim.

The question of whether a motor does give more power when stretched taut between hooks, as compared with a "slack" motor, has been fully investigated. All tests confirm that the useful power developed by a rubber motor is largely unaffected by the relationship between motor length and hook distance. In other words, from a given amount of rubber you can expect only a certain amount of useful work, irrespective of how that rubber is arranged. At the same time, however, taut motors do show a benefit in one respect. The power run of a motor where the hook distance is equal to the motor length is smoother than that of a slack motor. There is less tendency to bunch and possibly upset trim.

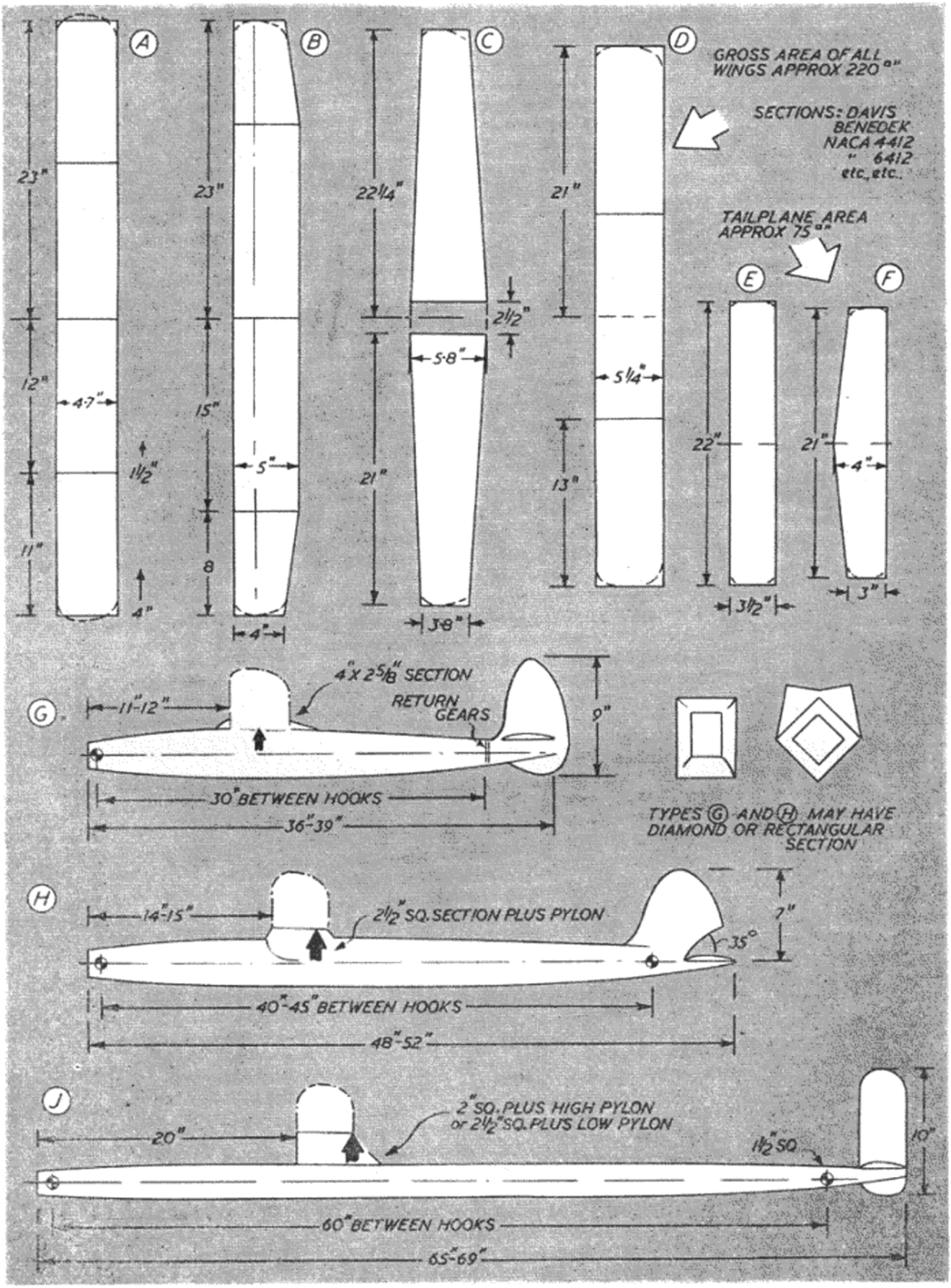
The modern Wakefield carries between 4½ oz. and 5½ oz. of rubber. This, on average, means a motor length of about 60 in. (with a cross section equivalent to between 14 and 16 strands of ¼ strip). To carry this motor taut between hooks in a single skein motor means a fuselage length approaching 6 ft.—a seemingly impracticable layout but one which, in actual practice, has proved most successful. This leads to the "long fuselage" Wakefield which, strictly speaking, originated in Italy in 1950 and appeared in the international field for the first time in Paris that year. However, these early Italian designs were not particularly successful. It was left to Hank Cole and other Americans in the following year to make full use of the possibilities of the long fuselage model and produce from the layout an outstanding contest design.

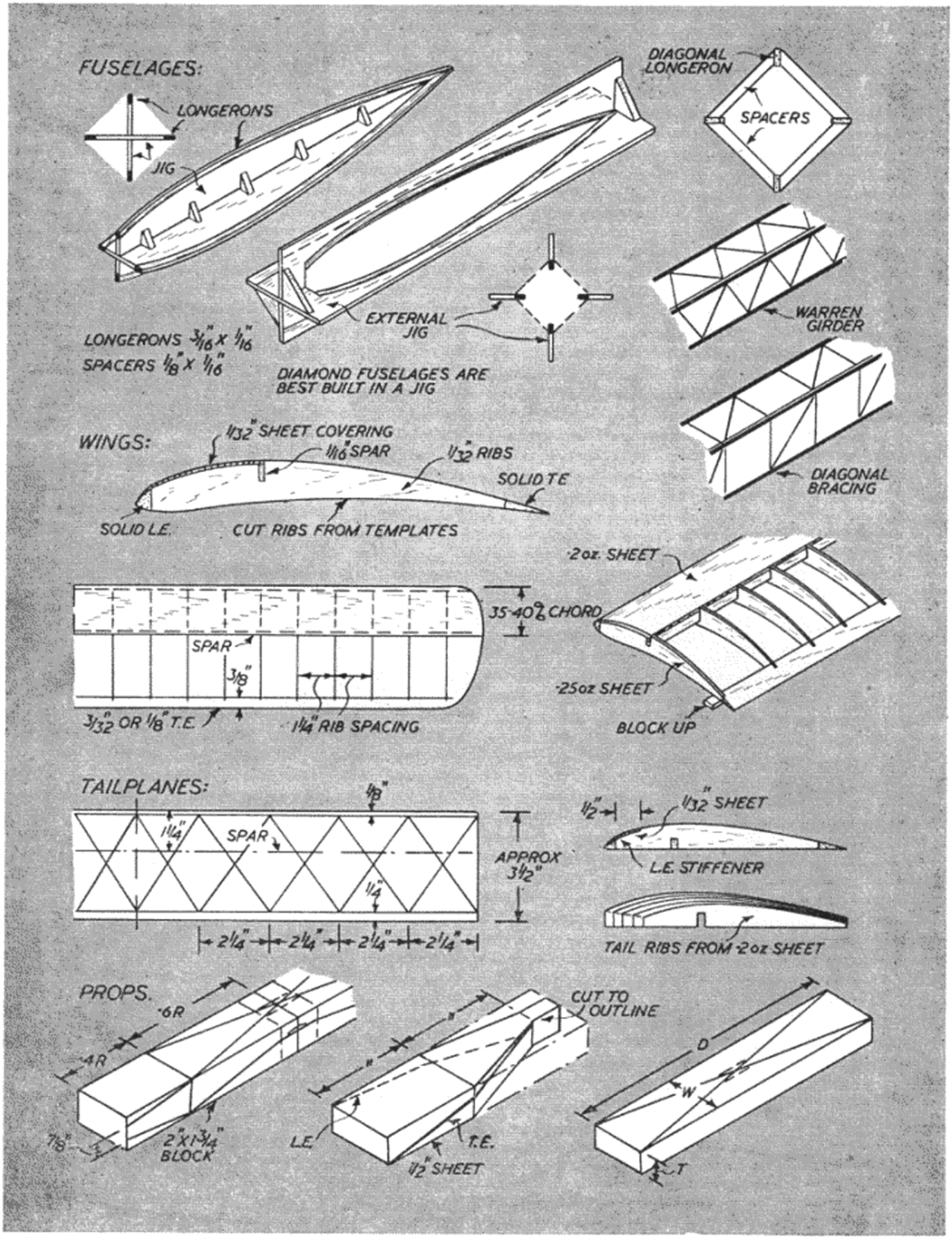
The alternative scheme for taut motors is, of course, to split the 60 in. motor into two separate skeins and employ return gears. This results in a fuselage of moderate length with all the virtues of a taut motor and a lighter, less vulnerable structure. The use of return gears also modifies the actual power output of the rubber somewhat, tending to reduce the initial torque and give a slightly higher torque over the following part of the run. The *total* energy delivered by the rubber is substantially the same.

For those designers who have preferred to stick to the single skein motor, used slack between hooks and tensioned by cording or mechanical means, the trend has been to increase the fuselage length over previous standards giving, in general, a smoother power output than might be expected from the same length of rubber in a shorter fuselage and also improving the stability of the model. The change in the Wakefield specification, when fuselage cross section was fixed at a definite minimum figure irrespective of fuselage length in 1951, was one of the main factors encouraging designers to try longer fuselages.

The three alternatives

Broadly speaking, the 1953 Wakefield designer has the choice of three alternative layouts capable of producing a machine up to modern contest standards—G, H and J. These are distinguished by fuselage length as the leading criterion, rather than the purely aerodynamic considerations of streamliner, semi-streamliner, etc. Aerodynamic design, in fact, has come to be regarded as of secondary importance to rubber weight. Improvements in performance resulting from refinements in aerodynamic design are, in general, small compared with the potential increase in duration resulting from carrying more rubber. To produce a model with more rubber and still keep the total weight down has led to simplification of outline design, so that a structure of adequate strength can be built down to a very light weight. In other words, a 3 oz. airframe of relatively poor aerodynamic design carrying 5 oz. of rubber is almost certain to have a better potential performance than a 4½ oz. streamlined airframe carrying only 3½ oz. of rubber. Since it is difficult to build a fully streamlined airframe down much below 4 oz. (and still have it strong enough) we can also say that adding 5 oz. of rubber to such a model, to compare directly in rubber weight with the first "slabsided" example,


A
23"
12"
4·7"
1½"
11"
4"
B
23"
15"
5"
8
4"
C
22¼"
2½"
5·8"
21"
3·8"
D
GROSS AREA OF ALL WINGS APPROX 220 □"
SECTIONS: DAVIS
BENEDEK
NACA 4412
" 6412
etc, etc.
21"
5¼"
13"
TAILPLANE AREA APPROX 75 □"
E
F
22"
21"
4"
3½"
3"
G
4"X 2⅝" SECTION
RETURN GEARS
11"-12"
9"
30" BETWEEN HOOKS
36"-39"
TYPES G AND H MAY HAVE DIAMOND OR RECTANGULAR SECTION
H
14"-15"
2½" SQ. SECTION PLUS PYLON
7"
35°
40"-45" BETWEEN HOOKS
48"-52"
J
20"
2" SQ. PLUS HIGH PYLON
or 2½" SQ. PLUS LOW PYLON
1½" SQ.
10"
60" BETWEEN HOOKS
65"-69"


FUSELAGES:
LONGERONS
JIG
DIAGONAL LONGERON
SPACERS
EXTERNAL JIG
LONGERONS 3/16" X 1/16"
SPACERS 1/8" X 1/16"
DIAMOND FUSELAGES ARE BEST BUILT IN A JIG
WARREN GIRDER
DIAGONAL BRACING
WINGS:
1/32" SHEET COVERING
1/16" SPAR
1/32" RIBS
SOLID T.E.
SOLID L.E.
CUT RIBS FROM TEMPLATES
·2 oz. SHEET
35-40% CHORD
SPAR
3/8"
3/32" OR 1/8" T.E.
1 1/4" RIB SPACING
·25 oz SHEET
BLOCK UP
TAILPLANES:
1/8"
1 1/4"
SPAR
1/4"
APPROX 3 1/2"
2 1/4" 2 1/4" 2 1/4" 2 1/4"
1/2"
1/32" SHEET
L.E. STIFFENER
TAIL RIBS FROM ·2 oz SHEET
PROPS.
·6R
·4R
7/8"
2" X 1 3/4" BLOCK
L.E.
T.E.
1/2" SHEET
CUT TO OUTLINE
D
W
T

will still produce an inferior potential performance to that same 3 oz. " slabsider " loaded up to the same total weight, with now, 6 oz. of rubber.

The choice between G, H and J is often a matter of personal preference, or experience. The leading designers tend to adopt one particular layout or type and stick to it, rather than try to develop all three together on a comparative basis. The time factor usually rules out the latter move, however desirable it may be. Thus what comparisons can be drawn must be taken between the three types developed and handled by different individuals. On this basis it can be said that all three layouts have proved successful—the geared models perhaps the more outstanding on account of their recent Wakefield successes. Geared Wakefields, too, have topped the British averages for the past two years.

The long and short of it

On an ideal day the long fuselage models appear to have the edge over their contemporaries, the layout seemingly possessed of outstanding aerodynamic qualities. The glide of a properly trimmed long-fuselage Wakefield fitted with a folding propeller is probably superior to that of the best of the other types. Its main handicap is its vulnerability. The long fuselage must not be too heavy, hence it must be built light. At the same time it must be rigid enough to withstand the torque of the motor. The practice of rigging these models with the centre of gravity on or near the trailing edge of the wing also means that stall recovery in gusty weather may be poor.

On balance, therefore, the long-fuselage Wakefield is still regarded as a " calm weather " model when its full potentialities can be realised without danger of the model being broken up. The geared model with its short fuselage can be a fine all-weather job, although it has not got the initial " zip " for take-off due to the inherent feature of a " split " motor having a lower initial torque than a single skein motor of the same cross section. This can be overcome by using a fine pitch propeller, although this will shorten the motor run and, due to the fact that the model flies faster under the initial power run, may also make the model a little more sensitive to thrust line adjustment. Used with a fairly high pitch propeller, a return gear system does enable useful power runs in excess of two minutes to be obtained from 4 oz. of rubber or more—at the expense of a rapid initial climb, unless the model is wound to the limit of the motors each time. This is not desirable as almost certainly strands will break in the motors during subsequent windings.

The type H model with an " in between " fuselage length and a single skein corded motor is, therefore, probably the best " general purpose " layout. It avoids the complication of a gear assembly and also the vulnerability of an extra long fuselage. Over a season's flying, however, it is not likely to beat the long fuselage model consistently in calm weather, or the geared model in the long run in all conditions.

Wing shapes allied to these different types of fuselage generally follow the simple rectangular outline of *A*, with moderate polyhedral ($1\frac{1}{2}$ in. at the first break and about 4 in. at the tips). A reasonably high aspect ratio is maintained. Aerodynamically a slightly better wing is produced by tapering the tip panels as in *B*. The former wing is generally made with normal two-spar or multi-spar structures. Type *B* wings usually have a single $\frac{1}{8}$ in. × $\frac{1}{16}$ in. or $\frac{3}{16}$ in. × $\frac{1}{8}$ in. spar, tapering, let into the upper surface of the ribs and sheet covered to the leading edge.

One piece wings are widely favoured for moder Wakefields, built quite light (about 1 oz.) and having a reasonably high aspect ratio. The wing of type D represents about the lowest aspect ratio now used on Wakefields and is typical of Scandinavian practice, used with moderate straight dihedral or tip dihedral. Split, tapered wings of type C are not common, although they are still employed on one or two outstanding designs. Their main disadvantage is the complexity of the fuselage fitting which more often than not means added weight.

Tailplanes, too, generally follow simple rectangular forms with squared tips and reasonably high aspect ratios. Chord length seldom exceeds 4 in. as a maximum at the root and span averages 21 to 22 in. Average tailplane area for all three types of models discussed is very much the same—about 75 sq. in., with the gross wing area about 220 sq. in. These proportions appear about the best. It is not considered good practice to reduce the tailplane area on the long fuselage layout with its greater moment arm as the stronger damping action of a 70 to 75 sq. in tailplane is necessary to overcome inertia forces set up if the model pitches.

Keeping the weight down

The most weighty part of the modern Wakefield is the fuselage. It is seldom possible to build this component down to less than 1 oz., covered. With an integral fin, $1\frac{1}{4}$ oz. is the usual minimum—long fuselage models somewhat heavier.

Diagonal arrangement of the longerons affords the possibility of a certain weight saving, but almost invariably means the use of some form of jig to build the fuselage. This may add to constructional time, but is generally worth the extra effort in the long run. A jig-built fuselage is generally more accurate than one built by other methods. If an external jig is employed, too, the jig can be used over and over again for duplicating the fuselage. Internal jigs have to be broken up to remove after the fuselage is completed.

The standard size for longerons, using diagonal construction, is $\frac{3}{16}$ in. × $\frac{1}{16}$ in. with $\frac{1}{8}$ in. × $\frac{1}{16}$ in. spacers. Spacer arrangement is usually designed for maximum rigidity. Warren girder construction is excellent in this respect. Geodetic is the most rigid of all, although slightly heavier. Diagonal bracing, or merely " square " bays with cotton bracing are practical alternatives.

Wing construction has not changed a great deal during the past few years. More designers are using a single, thin spar with a leading edge covering of

(*Continued on page* 122)

MODEL AIRCRAFT

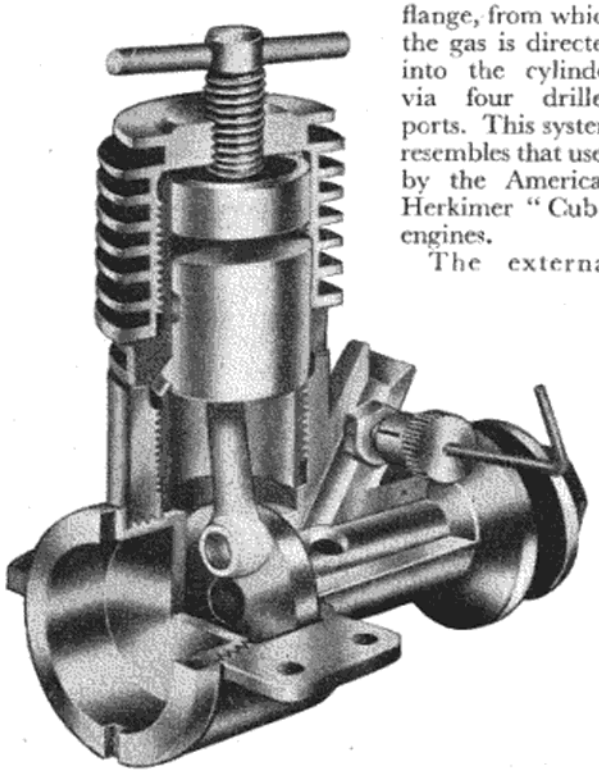
ENGINE TESTS

No. 45. "Typhoon Diesel" 2.47 c.c.

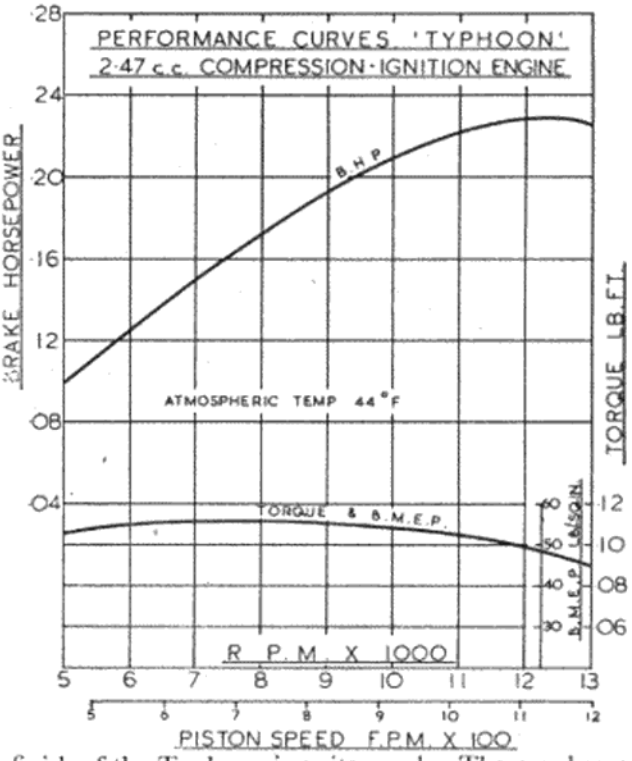
A WORTHY member of the now quite extensive family of "International," or 2.5 c.c. class engines, is Holland's "Typhoon-Diesel" made by Miniatuur-motorenfabriek "Typhoon" of Amsterdam.

This is a compact, light 2.47 c.c. model of the popular shaft-valve, radial-port type, possessing one or two interesting features. Externally, these can be noted in the sensible arrangement of the needle-valve control, which is inclined upwards and backward to keep the fingers well away from the prop. disc. This has been achieved by simply drilling the carburetter spray-bar hole at a suitable angle, an arrangement which is particularly effective and is also used by the E.D. .46, yet is surprisingly seldom employed by manufacturers.

Internally, the motor features a departure from the standard annular porting arrangement. It does not employ a grooved lower cylinder wall section for the transfer of the charge. Instead, there are two transfer channels below the exhaust flange, from which the gas is directed into the cylinder via four drilled ports. This system resembles that used by the American Herkimer "Cub" engines.



The external finish of the Typhoon is quite good. The crankcase is pressure die-cast and the cylinder barrel and head is machined from light alloy. The quality of the machining and finish of the working parts are to a good standard. A medium-low stroke/bore ratio (0.933 : 1) is used, bore and stroke being 15 mm. × 14 mm., a very popular combination for current 2.5 c.c. designs on the Continent, incidentally. This contributes to the short, stiff, crankshaft, which runs in a bronze main bearing of relatively generous diameter.



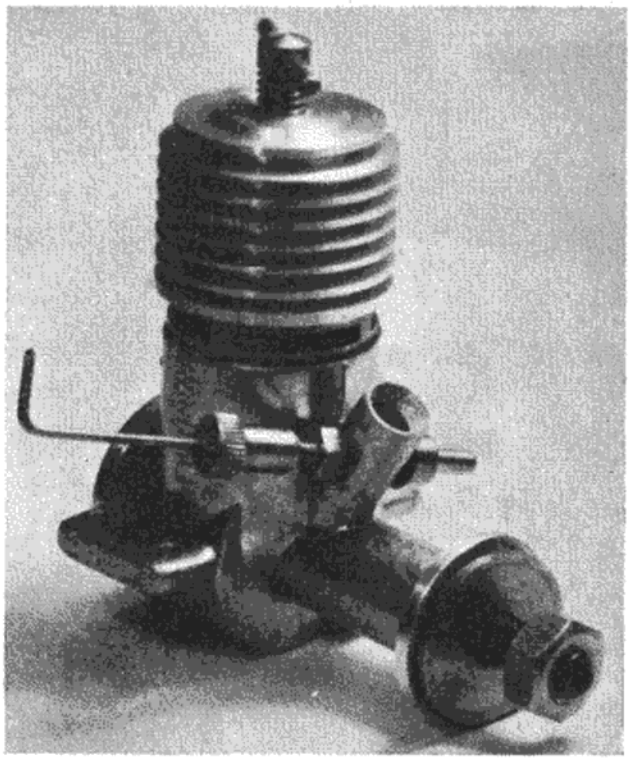
The sum total of these features is a compact, robust, well-handling unit which, as the test will show, possesses a good performance.

Specification

Type : Single-cylinder, air-cooled, two-cycle, compression-ignition. Induction via shaft type rotary valve. Radial exhaust and transfer porting with conical piston crown.

Swept volume : 2.474 c.c. (0.151 cu. in.)

Bore : 15 mm. (0.591 in.) Stroke : 14 mm. (0.551 in.)



Compression ratio : variable.
Stroke/Bore ratio : 0.933 : 1.
Weight : 3.9 oz.

General structural data : Pressure die-cast light alloy crankcase with screw-in rear cover and integral main bearing housing. Nickel-chrome steel cylinder-liner screwed into crankcase. Lapped cast-iron piston. Machined duralumin connecting rod. Solid steel gudgeon-pin pressed into piston. Nickel-chrome steel crankshaft, case hardened. Machined finned alloy cylinder barrel, threaded on to liner. Spray-bar type needle-valve assembly in brass. Beam type mounting lugs.

Test Engine Data

Running time logged prior to test : 1 hour.
Fuel used : Mercury No. 8.

Performance

General handling characteristics of the Typhoon are very good. Starting is easy and is performed without the necessity of priming through the exhaust ports. Once we had found the critical needle-valve setting, the engine was re-started, by hand, by giving four preliminary choked flicks, leaving the needle in its running position.

The approximate needle setting, over a wide range of loads on the test engine was 1⅛ turns open. There was little need to touch the needle at any time, but when it was desired to make fractional adjustments to find the optimum performance setting under any particular load, this was greatly assisted by the convenient location of the needle stem.

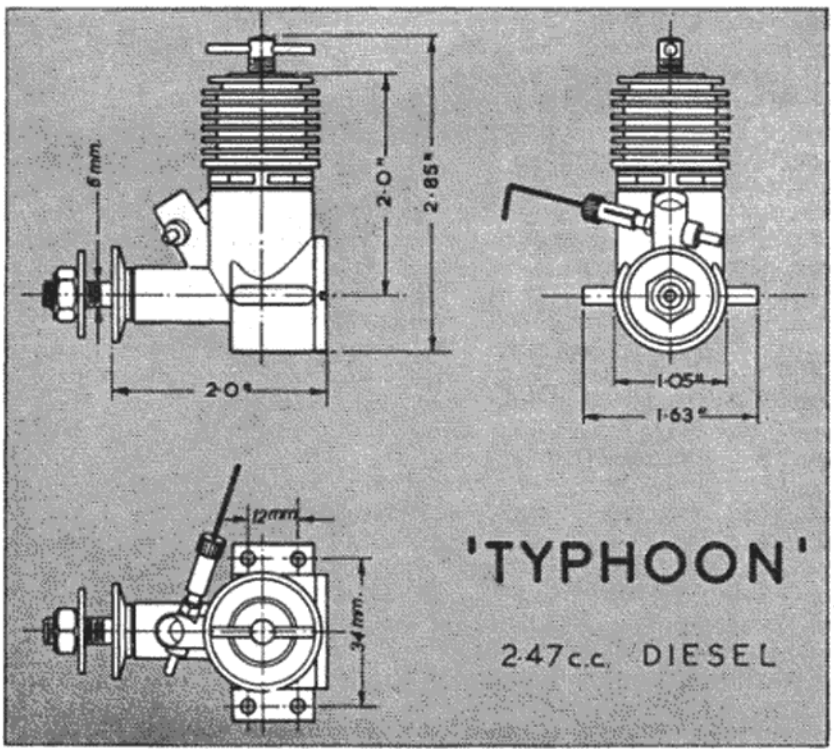
At moderate speeds the Typhoon would re-start leaving both needle-valve and compression settings in the running positions. Under light loads, however, the usual practice of starting on a compression adjustment lower than the running setting was followed. Both controls are responsive without being excessively critical and there is a useful measure of speed control by use of the compression lever. The needle-valve holds given settings firmly, unaffected by normal vibration at high speeds.

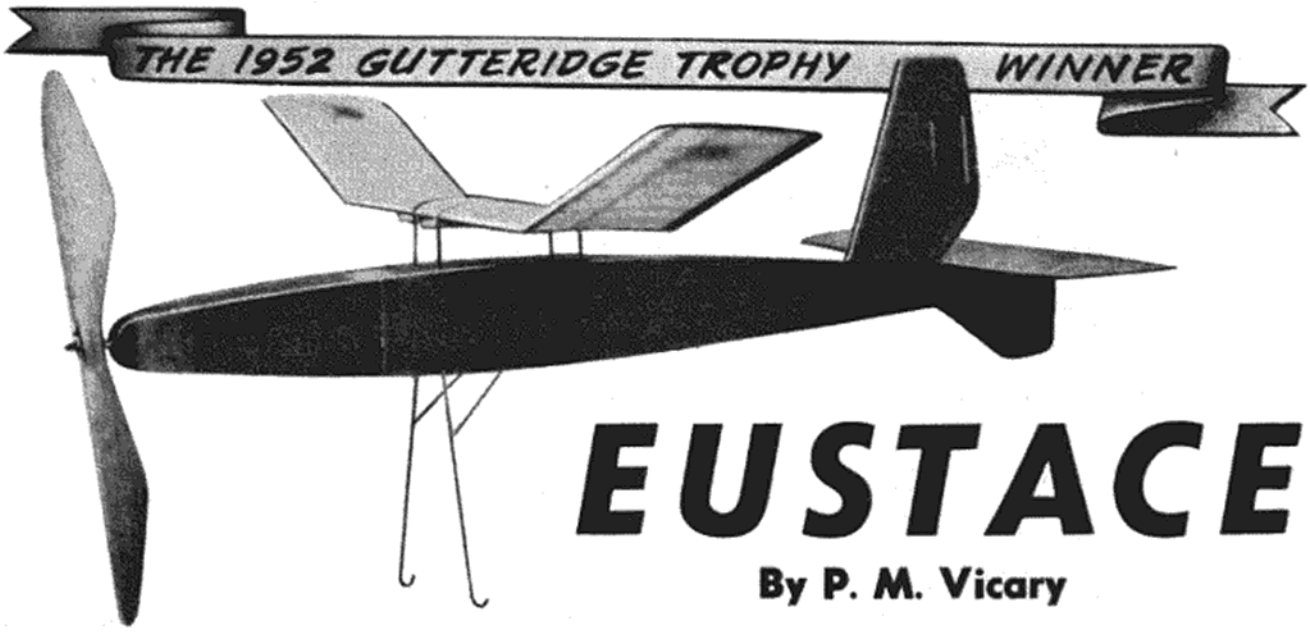
The loss of power which occurs with most diesels between the first few seconds' running and the engine reaching its normal operating temperature, is virtually of negligible proportions with the Typhoon. Over the 8,000 r.p.m. range of speeds tested, too, there was little fluctuation in output and the engine would hold even readings for prolonged periods.

The torque delivered at between 7,000 and 10,000 r.p.m. was notably good and the decline was smooth and gradual. As a result, an output of approximately .23 b.h.p. is realised at between 12,000 and 12,500 r.p.m. while 1/5th h.p. is available at less than 10,000 r.p.m., a very good performance indeed for a light-weight 2.5 c.c. diesel. The power/weight ratio thus achieved, it will be noted, is among the highest for the " International " class.

No troubles of any kind were encountered with the Typhoon, which came through its test in perfect condition. Some liberty was detected in the main

(*Continued on page* 147)





EUSTACE

By P. M. Vicary

The Mk. III version of this model was placed 6th in the 1951 "Weston Cup"

SINCE the writer flies his models where it is seldom blowing less than gale force, he set out to design a model that would be easy to build and above all simple and foolproof to fly under all conditions. This is an ideal model for those having a limited amount of spare time and wanting a model that can be quickly constructed, yet performs well.

Fuselage

Build the two sides together over the plan in the usual way. When thoroughly dry, remove sides and separate. Cement lightly at rear then fit spacers top and bottom at widest point. Allow to set, then cut and fit other spacers working from widest point, front and rear alternately. Use rubber bands around fuselage to hold spacers in position while drying. When complete bind and cement undercarriage tubes in position with jap tissue. Then make wing mounts and do likewise. Finally add gussets, etc.

Wing

Begin by making the paper tubes. Wrap brown gummed paper around $\frac{1}{8}$ in. diameter hardwood dowel; cut out the wing ribs. Commence construction on the flat section of the wing. Pin down the $\frac{1}{2}$ in. $\times$ $\frac{1}{8}$ in. trailing edge, packing up the front of it 1/32 in. Position the four ribs *C* and cement to the trailing edge. Next put the end ribs in position, cement the $\frac{3}{16}$ in. square leading edge into position. Slide the paper tubes through the holes in the ribs *C* and cement firmly. Add the remaining ribs and 3/32 in. square spars. Cover the two centre panels with one piece of 1/64 in. sheet balsa. Cut the two $\frac{1}{16}$-in. plywood dihedral braces. Slide each brace through the end ribs *B* and cement firmly to top and bottom spars. Next build the two outer wing sections leaving out the two spars. Pin down the flat section of the wing on a board long enough to take the whole wing. Cement the outer section bottom spars to the underside of the protruding dihedral braces. Cement outer sections in position on top of the bottom spars, at the same time supporting the wing tips so that there is 4 in. dihedral. When dry remove whole wing from board and cement the outer section top spars and gussets, etc. in position. Break a double edged razor blade until you have a long point. Slide it between the two 3/32-in. sheet centre ribs, *C* and cut through the bottom spar, paper tubes, top spar, 1/64-in. sheeting, leading edge and trailing edge. Slide the two $\frac{1}{8}$ in. diameter dowels (do not cement) in position. Now when the two wing halves are brought together, you should have a perfect join.

Tailplane

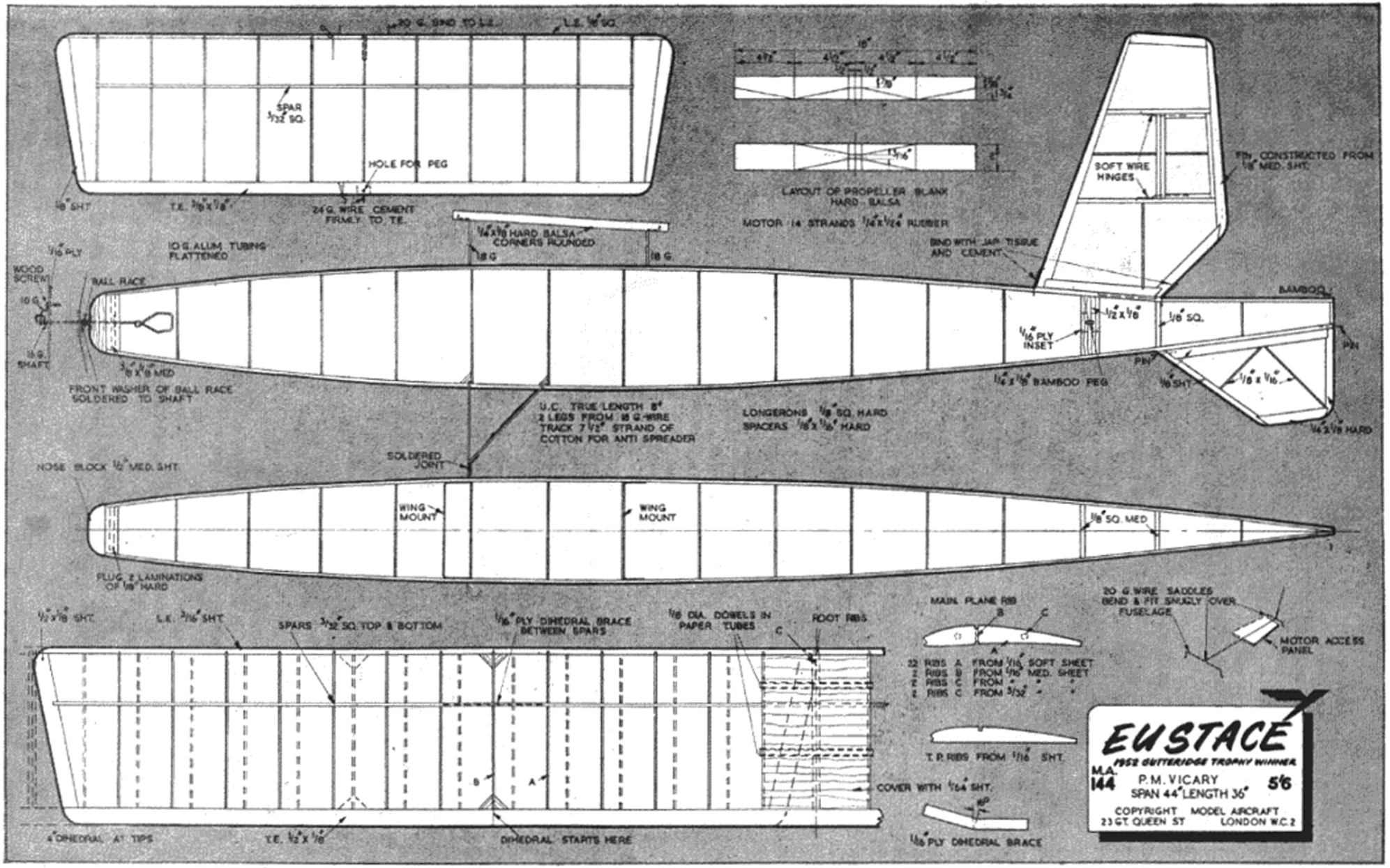
This is of conventional construction being built flat over the plan. Take care to bend the wire fittings accurately and bind and cement firmly in position.

Fin

This is built flat on the plan. Make sure the front and rear wire saddles fit snugly over the fuselage. Laminate two pieces of 1/32 in. medium sheet and cut to shape for rear motor dowel access panel. Push panel into fuselage. Place fin in position, and cement firmly to the panel. This method of fin fixing ensures the exact position for the fin every time. The underfin is self explanatory. It is important that the trailing edge be made from very hard balsa, as it takes quite a bump when the model D/T's.

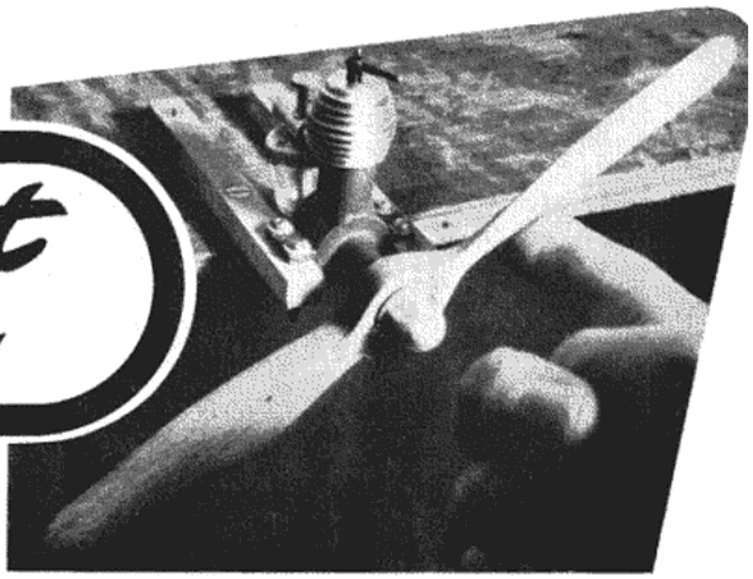
The undercarriage is bent entirely from 18-s.w.g. wire. A single length of strong cotton tied to each U/C leg stops the weight of the model collapsing them. Cover the wing and tail with Jap tissue and the fuselage and fin with lightweight Modelspan. Give the fuselage two coats and the wing and tail unit one coat of dope.

The weight of the model less rubber should not exceed $4\frac{1}{4}$ oz. (it will probably turn out below 4 oz.) Use 14 strands of $\frac{1}{4}$-in. $\times$ 1/24-in. rubber of sufficient length to bring total weight up to $8\frac{1}{4}$ oz. Trimming is by orthodox method. Always use the D/T.



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

Your First Engine



The MA Beginners Course Part 8

THIS month we turn our attention to power modelling. A few years ago this would have been an unusual step. Power models, it was then considered, were quite beyond the scope of beginners' interests. Nowadays, this is not the case at all, for power modelling has become so greatly simplified and extended that the smaller models can be tackled after only a very brief apprenticeship in more elementary types. In fact, not a few people have, of recent years, actually begun their modelling careers by building and flying power-driven models —particularly C/L. types.

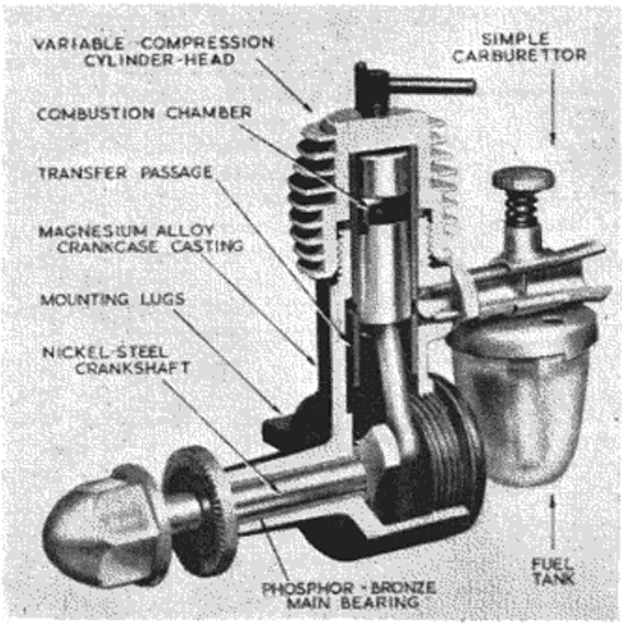
A good deal of this is due of course, to the excellent small power units, now available, which have enabled much smaller, cheaper and more easily constructed models to be built and which, in themselves, have done much to simplify the operation of a powered model aeroplane by great improvements in starting qualities and reliability.

It should not be assumed from this that every modern model engine is suitable for the beginner. This is far from the case. The requirements of modern contests have led to the introduction of some very high-performance model engines which are often either too big and powerful, or too tricky, for the inexperienced to handle.

The requirements of a beginner's engine are easy starting, reliability, moderate price and a size and performance suited to the types of models he will be building.

Fortunately, there are engines available in Britain which conform admirably to these requirements. We have in mind, especially, the Mills .75 c.c. and 1.3c.c. models. The former is a particularly delightful little engine (actually the current model is 0.73 c.c. capacity) being exceptionally easy to start and operate, light in weight, economical and inexpensive. It possesses a fine performance and, given reasonably careful treatment, will last almost indefinitely. If C/L flying is likely to be your main interest, then the purchase of the 1.3 c.c. model may be preferred, as its greater power will be useful. This model, too, is very easy to handle, but costs rather more. In between these two sizes is the 1 c.c. E.D. Bee, which is very popular indeed with beginners and can also be recommended.

Perhaps the most important quality in an engine from the beginner's point of view is easy starting. The three engines we have noted are particularly good in this respect. There are other easy starting engines on the market but, in general, they mostly have some other feature which makes them less



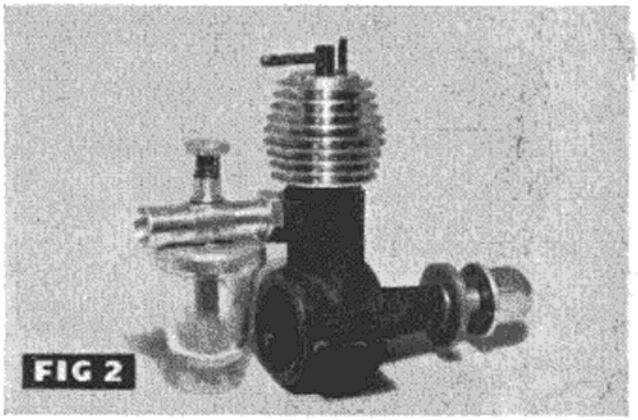
This excellent cut-away drawing of the Mills .75 clearly shows the components of a typical small diesel.

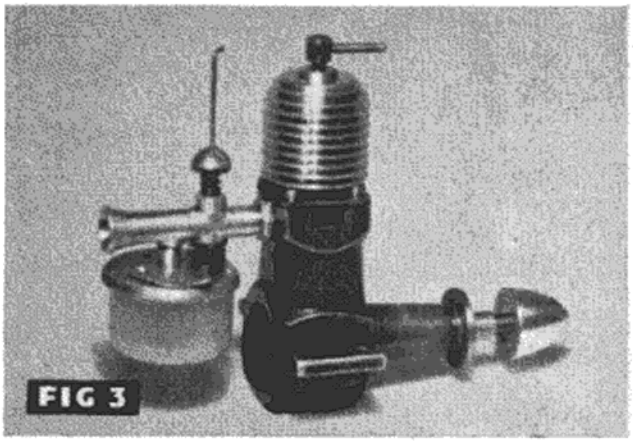
suitable. Some larger engines, for example, are easy to operate, but their size and power make them unsuitable for beginner's type models. Some of the more specialised types of engines, too, may look quite simple to operate when demonstrated by an expert modeller and, in fact, they can be—when one has the "knack" and "engine sense" which naturally comes with experience. But the raw beginner will do well to learn to walk before attempting to run, by starting with a well-known easy handling small engine, such as we have recommended.

The three engines we have mentioned, the E. D. Bee and the Mills .75 and 1.3, are all of the compression-ignition or "diesel" type. We shall not go into the technical aspects of engine operation at this stage. It will suffice to mention, for the benefit of anyone totally unfamiliar with present-day model motors, that the model diesel has not sparking-plug or electrical system. Instead, it has a high-compression cylinder which detonates the fuel charge automatically. The compression ratio, two or three times as high as for a petrol engine, is adjustable by means of a lever on top of the cylinder-head. See Fig. 1.

The purpose of this control is to adjust the timing of the ignition of the fuel charge. This is necessary in order that different propellers (which cause the engine to run at different speeds) can be used, and also so that the natural warming up of the cylinder (which will tend to ignite the fuel vapour sooner) can be compensated by reducing compression. A third use for this control comes in when it is desired to run the engine on a small propeller at high speed. For easy starting, we then adjust to low compression, after which the lever is turned to increase speed once the motor is running.

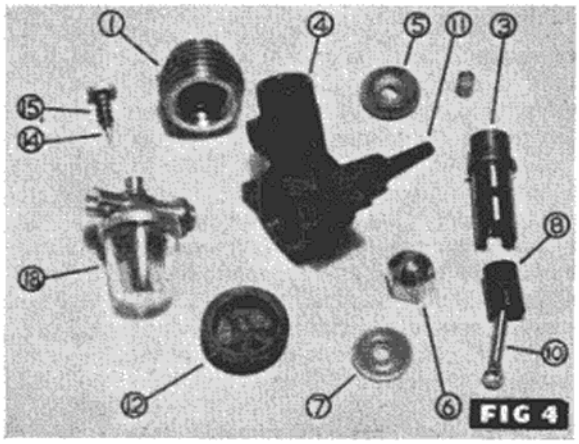
The only other control we have to bother with is the carburettor needle-valve. This simple device controls the amount of fuel admitted and thus the strength of the air/fuel mixture reaching the cylinder. If this mixture is either much too weak or much too strong, the engine will not work. Therefore we adjust the needle-valve to get the correct mixture.

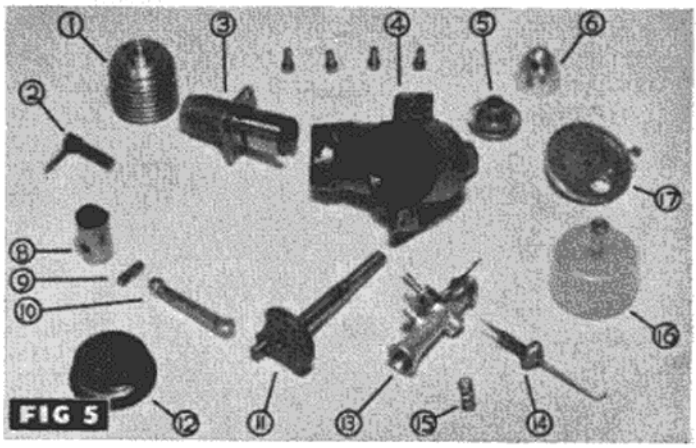




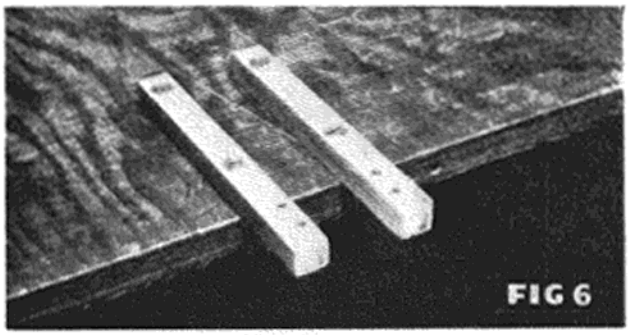
2. *The Mills .75, an admirable choice for the beginner.*
3. *The Mills 1.3, a finely made, easy starting engine of slightly larger capacity.*

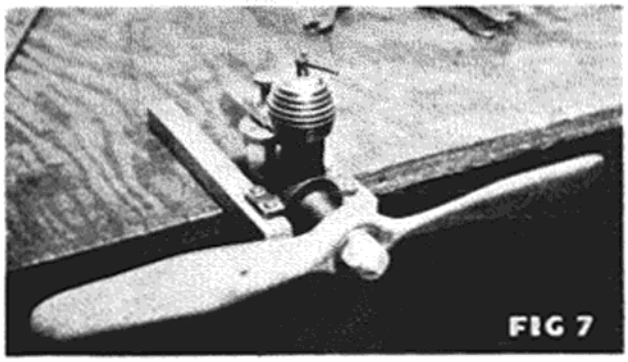
The fuel we use in our diesel is a special blend containing ether, which has a low ignition temperature and ensures easy starting. Many good branded fuels are available, usually costing about 3s. per 8 oz. bottle but if you are some way from a model shop and cannot get a proprietary blend, a good

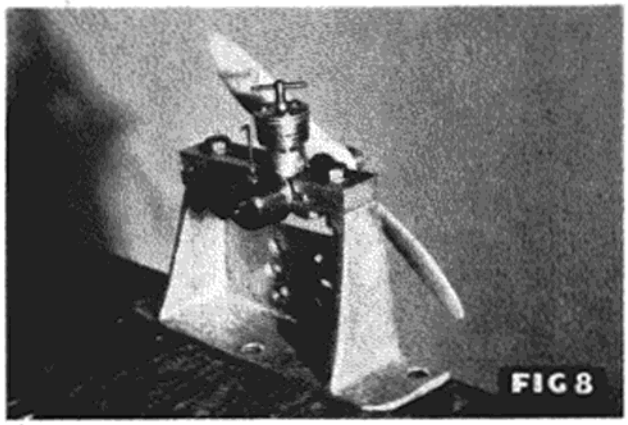


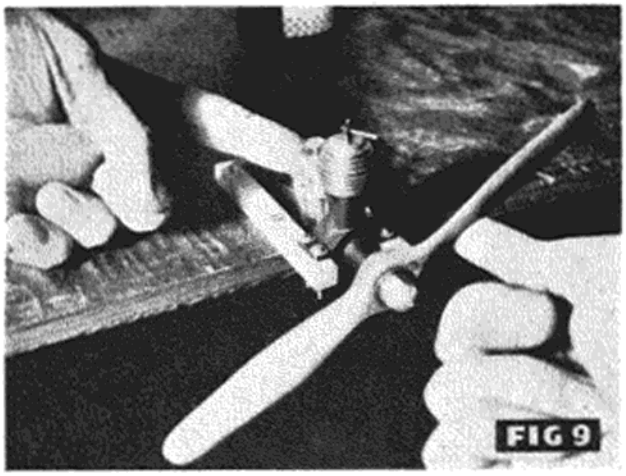


4 *and* 5. *Parts of the Mills .75 and 1.3 engines: 1, cylinder-head; 2, compression-lever; 3, cylinder-liner with contra-piston fitted; 4, crankcase; 5, driving-disc; 6, spinner-nut; 7, prop washer; 8, piston,; 9, gudgeon-pin; 10, connecting-rod; 11, crankshaft; 12, crankshaft-cover; 13, carburettor body complete with jet and cut-out; 14, jet-needle; 15, jet-spring; 16, fuel-tank; 17, fuel-tank cover; 18, carburettor and fuel-tank assembly.*









substitute can be made up, which will operate any model diesel, with equal parts paraffin, ether and castor-oil. The latter two substances you can get from a chemist. There are various kinds of ether, but if you specify either "anaesthetic ether" or "technical ether, BSS 579," you will be using the right grade.

Every modeller finds his first engine an absorbing interest in itself, quite apart from the interest attaching to its future use as a means of propelling models, and it is natural to try out the engine before building a model for it. In fact, this is a good idea in any case, since by first running the engine on a bench, the modeller will soon learn how to handle it.

For bench running, a suitable mounting must be made up. Most model engines are of the beam mount type, with flat lugs on either side of the crankcase, permitting them to be bolted down on to two wooden bearers extending back into the fuselage structure. For bench running, these bearers, which should be of hardwood and not less than $\frac{3}{8}$ in. square in section, may be screwed to a bench, as shown in Fig. 6. Make sure that they are quite flat and parallel, otherwise the crankcase of the engine will tend to be distorted.

Fig. 7 shows the Mills 75 mounted in this manner. 6 B.A. machine screws are used, with flat washers under the heads of the screws and also under the nuts. To ensure that the nuts do not later loosen with vibration, it is a good idea to make a practice of fitting a second nut on each screw in the form of a locknut.

An alternative method of bench mounting is to use a flat piece of wood, say, 5 in. × 3 in. and $\frac{3}{8}$ in. thick, in which a U-shaped cut-out is made in one end to fit the crankcase of the engine. Whatever type you use, make sure that you drill the bearers to line up with the mounting holes accurately. This can best be achieved by drilling one hole only, fitting the engine with a screw through this and then carefully marking the remaining holes through the engine lugs.

Although, perhaps, of less interest to the beginner than to those who already possess more than one engine, there is also available a very useful type of ready-made cast aluminium engine mounting (costing about 10s.) which is adjustable to take many different sizes of engine. This is shown in Fig. 8 with the E.D. Bee engine mounted. Engines are fitted, or can be changed over, in a matter of seconds.

When fitting the propeller, tighten it on the shaft in such a position that when a blade is brought gently up against compression, the airscrew rests in an approximately horizontal attitude. (Fig. 7.) By this means, we ensure that when a model is gliding down after the engine has stopped, the airscrew is in the best position to avoid a blade being broken off on rough ground, or the engine shaft being bent. This is also a good position to aid starting, since it allows a good strong swing, or "flick," to the pro-

6. *A simple bench mounting for practising engine starting and handling.*
7. *The Mills .75 mounted and ready for starting. Note the horizontal position of the airscrew.*
8. *The Hales cast aluminium engine mount shown here with an E.D. "Bee" engine fitted.*
9. *"Sucking-in" prior to starting. The forefinger of the left hand covers the carburettor intake.*

peller, in which the hand " follows through " towards the body.

When flicking the prop, place the forefinger (or forefinger and middle finger if you wish) fairly close up to the boss or hub of the airscrew. (See Fig. 9.) In this position one gets the fastest and most efficient flick for a quick start and the fingers are well out of the way when the engine starts. If we attempt to swing the prop from a point near the tip, it is rotated at a much lower speed which may be insufficient to start the engine or, alternatively, if it does fire, may cause the following blade to strike the hand before it can be withdrawn. Remember that, when running, your engine may be turning at a rate of 150 times per second and these small engines are into such a stride almost immediately upon starting. You need have no fear of getting your fingers rapped if you follow the rules.

As regards the actual size of the prop to be used, let the maker's instructions be your guide. Commercially made props are almost invariably stamped with the diameter and pitch measurement. For learning to start the Mills .75, we would not recommend anything smaller than an 8 in. × 4 in. prop. For the Bee an 8 in: × 6 in. or 9 in. × 4 in. could be used, although the standard E.D. 7¾ in. × 6 in. plastic prop is very suitable. For the Mills 1.5, a 9 in. × 6 in. prop can be used. If smaller airscrews are used, then a somewhat higher compression adjustment will be required and starting may not be so easy. If larger sizes are tried, a lower compression adjustment may be necesssry.

The actual procedure for starting a model diesel varies slightly from one make to another but once you have become practised, you will have no difficulty in starting any other engine of a similar type.

At first you may not be very well encouraged by the results of your efforts, but don't let this worry you. The more you persevere with your engine, the quicker you will acquire that " engine sense " by which you will automatically begin to do the correct thing. By touch and ear alone, you will then be unconsciously guided into making the right movements. This is worth far more than any amount of words and the following instructions are therefore intended only as a guide to setting you on the right course, by which you may learn for yourself the art of correct handling of a model diesel.

First, check that the control settings (needle-valve and compression adjustment) are in accordance with the maker's recommendation. (A test card is usually enclosed, with each new engine, showing these.)

(continued overleaf)

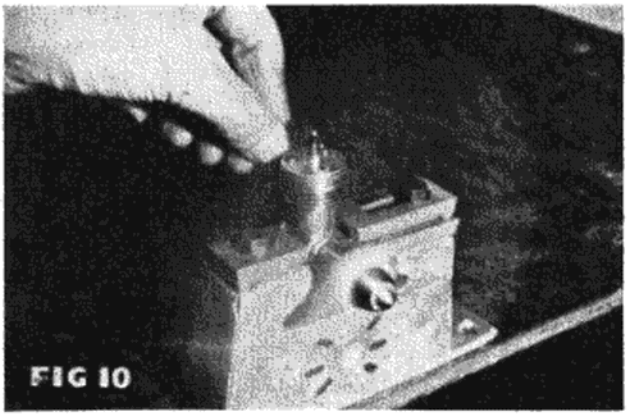


FIG 10

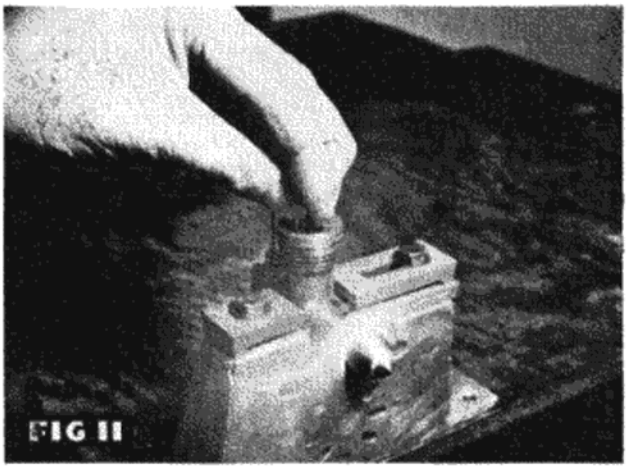


FIG 11

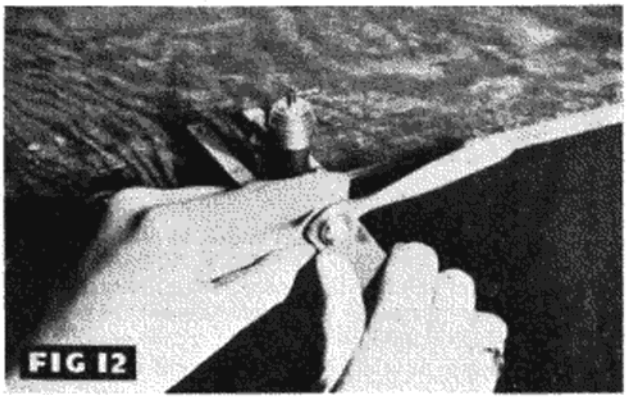


FIG 12

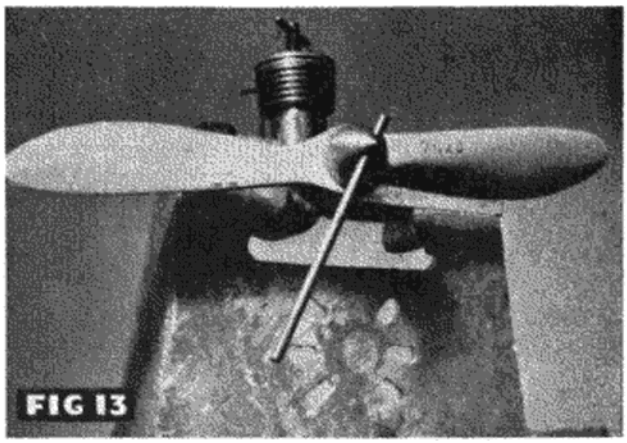


FIG 13

10. *Best performance is obtained with a relatively fine needle-valve opening.*
11. *A degree of speed adjustment is obtainable by turning the compression-lever.*
12. *A short spanner, or special airscrew wrench should be used for tightening hexagonal prop nuts. Never use pliers.*
13. *Where a " tommy-bar " is required for the spinner-nut, this should be short and should fit closely in the spinner hole as shown.*

Flick the engine over several times. Take notice of how the engine feels and sounds while you are doing this.

Now fill the fuel tank, place a finger over the end of the carburettor air intake to completely choke it and flick the prop about three times. (Fig. 10.) This is to suck the fuel up into the carburettor and to induce a rich charge into the engine for starting.

Uncover the intake and flick the prop again. You will note that it now sounds " wet " and that there is a slight sucking sound in the carburettor. You may, if you are very observant, also notice that the engine now turns very slightly more freely—due to the lubricating action of the fuel which loosens any gummy residual oil.

The engine should now start within a few smart flicks of the prop. If it does not fire within, say, twenty flicks (we are tending to err on the generous side to avoid any risk of flooding), choke the intake for a couple of flicks and try again.

If the engine still does not fire, increase the compression very gradually until it does. If, when the engine fires, it will not now continue to run, reduce the compression slowly. It is possible that, in the process of finding the starting compression, an excess of fuel has been drawn into the crankcase which is now being thrown up into the combustion chamber each time the engine fires. As it is used up, so the lever can be screwed down again until the engine is running fastly and smoothly.

The best performance is obtained with a relatively weak mixture and high compression. Therefore we close the needle-valve gradually to obtain this. (Fig. 11.) It is less likely that an increase in compression will be required because as the engine warms up, so the ignition point becomes automatically advanced for higher speed. It may, in fact, be necessary to slacken off the compression slightly. The necessity for this is indicated when the engine begins to slow up. Reduce the compression until a slight misfire is heard, then increase it again until the miss just disappears. Running the engine with excessive compression should be avoided.

In general it should be remembered that the critical needle setting hardly alters with speed or load (i.e. propeller used) but that the compression adjustment does depend on these factors. Also, to get the engine to run slowly on any prop, all we have to do is to slacken off the compression.

To conclude, here is a brief summary of common starting troubles and the remedies for them :

1. Engine starts but peters out again after a brief run. Cause : mixture too weak. Remedy : open needle-valve about ¼-turn more, choke intake for a couple of flicks and re-start.

2. Engine slows down and oscillates back and forth or stops. Cause : mixture too rich and/or compression too high. Remedy : close needle-valve, reduce compression, flick prop to work off excess fuel, open needle-valve to lower setting and re-start.

3. Engine runs but misfires. Cause : inadequate compression. Remedy : increase compression.

4. Engine runs but with smoky and oily exhaust, irregularly and with reduced power. Cause : mixture too rich. Remedy : close needle-valve slowly until running improves.

Trends in Wakefield Design

(Continued from page 113)

1/32 in. sheet (sheet weighing .2 oz. per sheet) for additional rigidity. The trend towards using thinner aerofoil sections has meant that single deep spars without sheeting are not always practical.

Tailplane construction is now tending more and more to adopt geodetic rib layout, a typical arrangement being shown in the sketches. Using very light sheet for the ribs and a single spar, resulting tailplane weight is very low (about ⅛ oz. to $\frac{3}{16}$ oz., covered).

The one aspect of Wakefield design which is still in a fluid state is that of the propeller. Until a year or so ago, Wakefield prop design had more or less standardised itself around an 18 in. diameter carved from a 2 in. × 1¾ in. block. The layout dimensions given in the diagram produce a 30 in. pitch propeller from an 18 in. dia. block.

However, there has been a trend to make two-bladed propellers with the blades plugging into a wound paper, metal or fibre tube hub—not only for feathering propellers, but for normal free-wheeling propellers as well. Once the blades are carved, the required pitch is obtained by setting the blades at the correct angle. Initially, most of these built-up propellers were carved from block (as a complete two-bladed propeller, then parted in the middle), but it was soon appreciated that individual blades could equally well be carved from ½ in. sheet balsa, with consequent economy in material used. The sheet is cut to propeller plan shape, as shown in the second propeller sketch, the position of the leading and trailing edges marked on the *edges* of the blank and the blade carved to these guide lines.

The most recent trend has been towards the use of large diameter propellers. At present a 24 in. diameter prop is the largest which has proved successful in practice, with a pitch : diameter ratio of 1. So far the best of these large-diameter propellers have been of true constant geometric pitch, carved from large blanks as shown in the third sketch.

The table lists suggested design data, together with recommended block sizes for " diagonal " layout as shown in the sketch.

Dia. in. ...	18	19	20	21	22	23	34
Recommended pitch in. ...	30	30	28	26	25	24	24
P/D	1.66	1.6	1.4	1.25	1.15	1.05	1.0
W in.*	3	3¼	3½	3½	3¾	4	4
T in.*	1.6	1.6	1.5	1.4	1.35	1.3	1¼

* Suggested values.

Topical Twists

Not "Towing" the Line

A special timekeeping problem has arisen from the opportunist tow-line manoeuvres of the more advanced glider enthusiast. Seeking those few seconds duration advantage which can make all the difference to the comp. result, the idea is to stray as far upwind as possible before releasing the model.

And a good idea—son, but one which can, perhaps, be overdone. Or, so it would seem, from an extract taken from a recent club report which refers to a member "... who endeavouring to cure a tow-line wobble went off in a straight line and was out of sight in 3 mins. dead."

Must have placed the timekeepers in quite a dilemma.

● ● ●

Snowmanship

It really has me beat
Why a model meet
Can't just be simple, unadorned and real.
But it seems the modern trend
Is more concerned to lend
An aura of spectacular appeal.

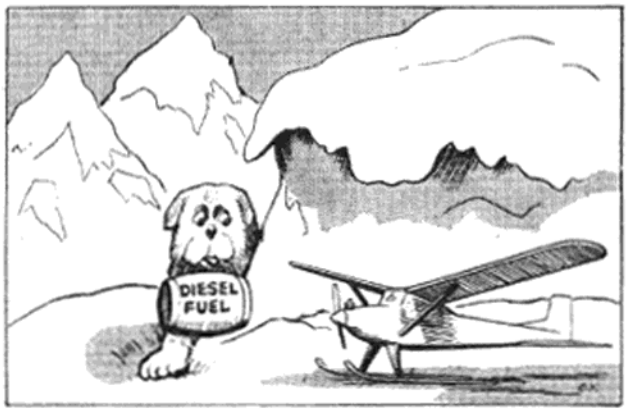
The latest model wheeze
Is a free flight comp. on skis
Or any other rise-off-snow device.
So the time's not far away
When with ballyhoo display
We're presented with "The Wakefield Cup on Ice."

● ● ●

Mere Childplay

Writing on model aircraft in a popular weekly, a certain journalist endeared himself to the hearts of all model builders by indulgently referring to their machines as toys. Presumably such publicity can only be beneficial to our hobby, which, on the commercial side at least, is now mainly devoted to producing prefabricated playthings for the kit-conscious kiddiewinkies of this jet-minded age. But to we few diehards who, in the face of the general public's amused contempt, cling to the fond belief that aeromodelling is both a mature and intelligent pastime, this unwholesome emphasis on "toys" has a most humiliating effect.

I well remember, a few years ago, a screaming headline proclaiming our august Wakefield Event as an "Elastic Band Model Plane Contest." Now, having just about lived that one down my prestige has again been reduced to the toddler level by this latest toy tirade.



And, speaking of toys, I have been toying with the idea of a suitable fate for all journalists who snipe at us from behind the toy counters of their nursery imaginations. I suggest that they be put in front of a firing squad composed of P.R.O.s. After which, of course, the P.R.O.s meet a similar fate for allowing this sort of "toy" publicity to happen, anyway.

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UNDER THE COUNTER
The T.T. Trade Review

Forgotten the rubber bands again? Then you will be interested in the latest product of **Messrs. Stretchplus Ltd.**, a dummy packet of bands specially designed for leaving at home on contest days.

* * *

For the modeller who is trying to economise by giving up smoking, **Messrs. Wackywick** offer a unique type of D/T fuse, which can be readily ignited without using a lighted cigarette.

* * *

After exhaustive research the **Supertool & Supersonic Electronic Co.** are offering to the discriminating modeller the most efficient tool yet devised for the cutting of balsa wood; an old razor blade.

* * *

A novel type of water transfer is available from **Pulchritudinous Products Ltd.** On the outside of the model will be seen a fully clothed version of your favourite pin-up girl, but when you look through the cabin window. . . .

* * *

From **Messrs. Eezi-Bild** comes the *Voodon't*, a completely prefabricated model of Tibet's latest fighter. This kit is so straightforward that it can be speedily assembled by the veriest nitwit. Just the kit *you* have been looking for.

* * *

For your junk box! **Messrs. Diceymolds** have produced yet another plastic fuel tank. And for the contest-minded, a new glow-fuel from **Duffdopes**—definitely does not contain chlorophyll.

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A Lengthy Subject

In defending the present day Wakefield rules a correspondent to this journal states that "we have come a long way from Penaud to Bilgri."

And how true! Why, the distance from prop. to tail must be at least three feet.

Yet another correspondent on the Wakefield issue suggests that the introduction of a "pay-load" would present the world with a competition in keeping with British traditions.

Which is just one swell idea! Guess we Limeys of this li'l ole 49th State sure are suckers for that tradition angle.

● ● ●

Uplift

We are reminded that, when first introduced, D/ts were criticised for the limiting effect they would have on model performance. Nowadays the demand of the duration fiends would seem to be, not for a dethermaliser to bring the model out of a riser, but for a "dedown-draughtiser" to reverse the procedure.

Pylonius

The SH Transmitter

By E. C. Sills

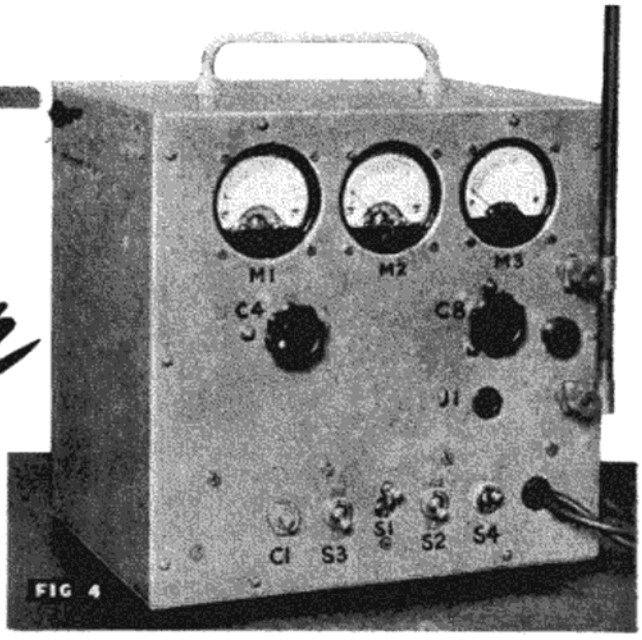


FIG 4

In the October issue of M.A. we published the design of the S.H. Receiver. Now, in response to many requests from readers Mr. Sills has produced the transmitter, completing a first-class R/G outfit.

THE transmitter to be described was designed primarily to have very good frequency stability and to make the best use possible of the maximum input power allowed by the authorities. All other considerations, such as size, weight, number of valves, etc., have been subordinated to these two aims. One or two refinements have been incorporated, but if not required may be omitted as indicated in the text.

The block diagram of Fig. 1 shows in a simplified form the function of each stage, and reference to it will assist in clarifying the description which follows.

Radio Frequency Section

We will first consider the operation of valves V_1, V_2 and V_3, since their circuit configuration determines to a large extent the ultimate quality and performance of the transmitter. In order to meet the criterion of frequency stability laid down in the first paragraph, a quartz crystal is an automatic choice for frequency control. V_1 is a simple crystal oscillator, working at a frequency of 9 mc/s. This choice of frequency means that a robust crystal may be used, with non-critical settings for the anode tuned circuit L_1C_1. In order to change the frequency to 27 mc/s, a " tripler " stage, V_2, is incorporated

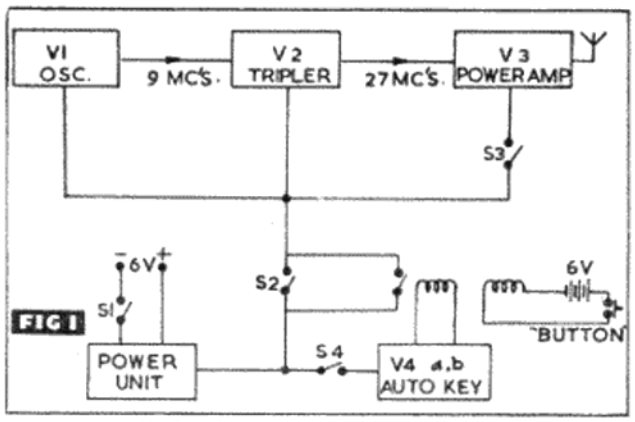


FIG 1

which operates as follows. The signal at 9 mc/s is applied to the grid of V_2 which acts as a distorting amplifier. The anode current contains, in addition to the fundamental at 9 mc/s, a series of harmonics at 18 mc/s, 27 mc/s, 36 mc/s and so on. Any one of these harmonics may be selected for further amplification by suitably tuning L_2C_4. In the present instance, we wish to select the third harmonic, therefore L_2C_4 is tuned to 27 mc/s. The power level at this stage is low, and a power amplifier, V_3, is added to feed the aerial. The aerial coupling link, L_5, can be moved with respect to the anode coil L_3L_4 by means of the simple mechanism shown in detail in Fig. 5.

Method of Switching

It will be appreciated that we could effect control of the transmitter simply by interrupting or " keying " the high tension supply to the valves in the usual way. However, at the expense of a little complication, several valuable features become apparent.

S_1 applies the 6 V supply to the power unit and valve heaters, and therefore is the main on/off switch. For the moment, ignore the auto-keying stage and keying relay, and assume too that all switches other than S_1 are open. If S_2 is closed, H.T. is applied to V_1 and V_2, but not to V_3. A weak signal results, and can be used to simulate long range conditions. If S_3 is closed, the transmitter will operate at full power. It should be obvious from Fig. 1 that if S_3 is left closed, S_2 will key the whole transmitter. In order to guard against the possibility of electric shock, keying is not carried out by connecting the button across S_2, but via a relay. It will be noticed that there are two windings on the relay, one of low resistance in series with the button and the 6 V supply, for normal manual operation, and the other connected to V_4a. By closing S_4, the second winding may be energised by the anode current V_4a which flows in short bursts at intervals of five seconds or so. The transmitter is thus automatically keyed, which enables one to carry out long-

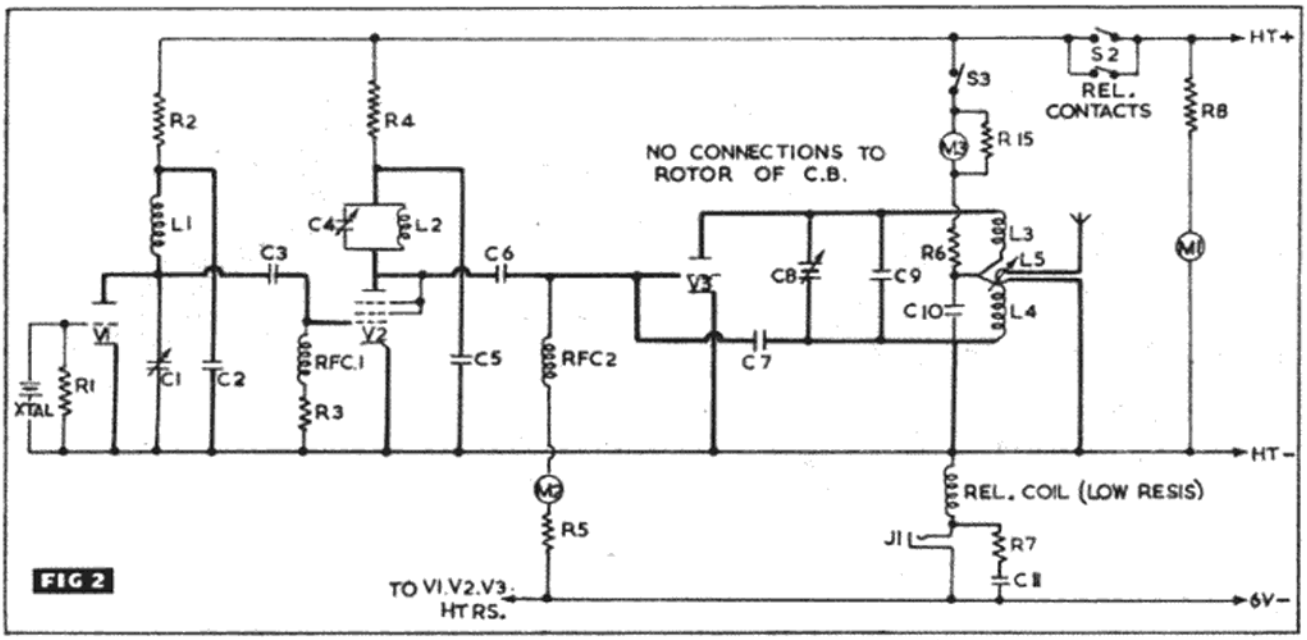


FIG 2

range checks single-handed. It will be apparent that V_4 and its associated components may be omitted in order to simplify the transmitter, and with this in mind, the automatic keying circuit has been drawn separately. S_4 is a double-pole switch, in order to reduce battery current to a minimum when the automatic keying facility is not required. If it is desired to lengthen the interval between pulses when using the automatic key, increase the value of R_{10} (do not exceed 2.2 m) or, if the interval is still insufficient, increase the value of C_{14}. R_{11} and C_{13} similarly control the duration of the emitted pulse.

Power Supply

Although, in the writer's transmitter, all power supply components were taken from an ex-government power unit type 21 (which is still obtainable) any type of power supply capable of delivering some 250 V at 40-50 mA would be in order.

Construction

It is essential, in order to guard against losses, that the panel and chassis should be of non-ferrous metal, i.e. aluminium, duralumin, copper or brass. Figs. 4, 5, 6 and 7 should enable a reasonable layout to be arrived at, the main thing to bear in mind being the necessity for short connections in the R.F. circuits. Try to drill all necessary holes first, as nothing is more annoying than to be diverted when one is concentrating on wiring. The connections which are emphasised in Fig. 2 must be made as short as practicable, and kept clear of the chassis and other connections (unless the emphasised connections themselves are connected to the chassis). C_1 may be mounted directly on to the panel, when the earth connection to the rotor will be made automatically, but C_4 and C_8 are both insulated from the panel. C_{10} should be earthed at a point adjacent to V_3 cathode connection.

The crystal plugs across pins of a standard international octal valve-holder. Two crystals may be seen in Fig. 6, but one is simply carried as a spare. The polarity of connection of the 6 V supply should be carefully noted, since protective bias for V_3 is derived from it. The aerial coupling link is variable as previously explained and enables one to adjust

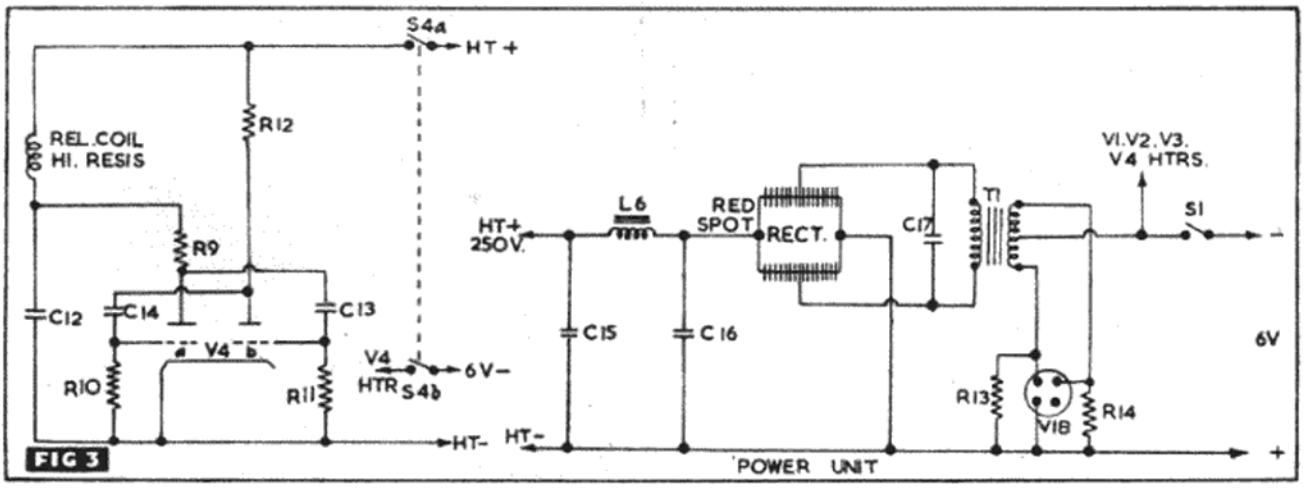


FIG 3

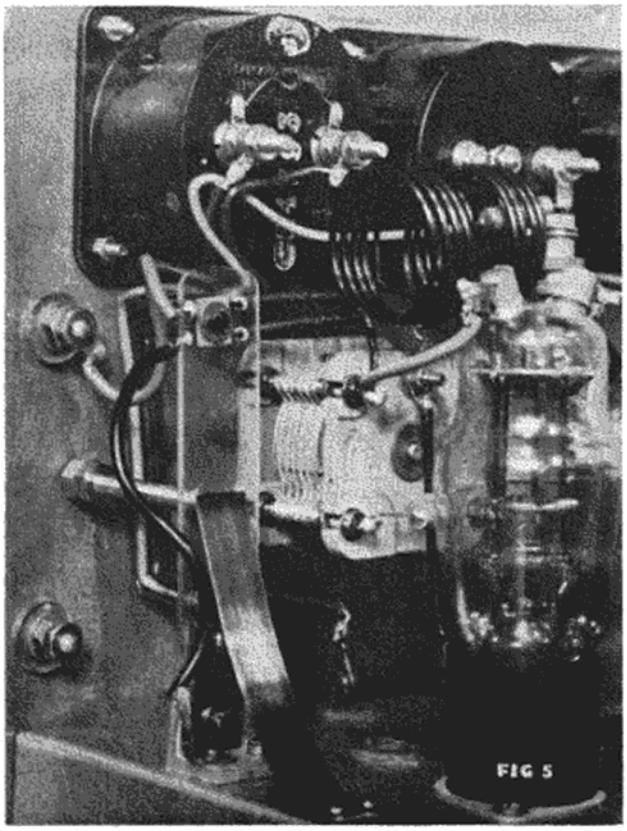


FIG 5

for maximum input under varying soil conditions. The link coil is mounted on a strip of $\frac{1}{8}$ in. thick perspex, which is constrained towards the panel by a flat steel spring. The stop against which the perspex bears is a piece of 2-B.A. brass studding which is threaded into the panel and furnished with a small knob. Rotation of the knob allows the link to move with respect to L_3L_4, thereby varying the coupling. The knob itself acts as a stop to limit motion away from the panel, and two nuts locked on to the studding serve to limit motion towards the panel. Two flexible leads connect the aerial link coil to chassis and aerial terminal. If an external battery is used to supply power to the transmitter, it is worth while to make the battery leads equal in length to the aerial. When they are laid out straight along the ground, radiation from the aerial is considerably increased in all directions.

In the event that it is desired to use only one meter to monitor the operation of the transmitter, it is suggested that the modified circuit of Fig. 8 be adopted. The voltmeter M_1 (useful for computing power input) may be omitted altogether.

S_5 may be a toggle switch rated at 250 V, and serves to put the meter either into the grid circuit of V_3, or the anode circuit of V_3. In order to construct a shunt for the meter, obtain a 750 W electric fire element (obtainable at the chain stores) and proceed as follows. Connect the meter in series with a variable resistor of 2,000 ohms and a 2 V or 6 V accumulator. Ensure before closing the circuit that the zero adjustment of the meter is accurately set. Now adjust the resistor for exact full scale deflection of the meter. Connect a piece of the element wire across the meter terminals and adjust its length until the meter deflection falls to one-tenth of its previous value. The full scale deflection of the meter will now correspond to 50 mA, but final adjustment should be made with the instrument *in situ*.

Setting-up Instructions

(1) *Crystal oscillator stage*

Prior to switching on, carry out the following drill. Open all switches; disconnect R_4; connect a 5 mA meter in series with R_2, the positive terminal being connected to chassis; place V_1, V_2 and V_3 in their respective sockets; set C_1 to zero capacity. Now close S_1 and S_2. Allow the valves time to heat up, and then slowly increase the capacity of C_1 until the meter reading is at a maximum.

Note.—If C_1 is increased much beyond this point the crystal will suddenly cease to oscillate and the meter current will fall to zero. Now reduce the capacity of C_1 until the meter reading is 25 per cent. or so lower than the maximum value reached. The meter should now indicate a current of about 2 mA. Reconnect R_3 and R_4.

(2) *Tripler stage and power amplifier*

With all other adjustments as indicated above, adjust C_4 for maximum grid current to V_3 as indicated by M_2. If V_2 is working properly, this current should be about $2\frac{1}{2}$ mA. With S_3 still open, *slowly* rotate C_8 from maximum to minimum capacity, and watch M_2 very carefully for signs of a "dip" or "flicker." Very carefully adjust C_7 by twisting or untwisting the wires until the dip disappears. When satisfied with the adjustment of C_7 (a technique known as "neutralising"), close S_3 and quickly tune C_8 for minimum anode current to V_3 as indi-

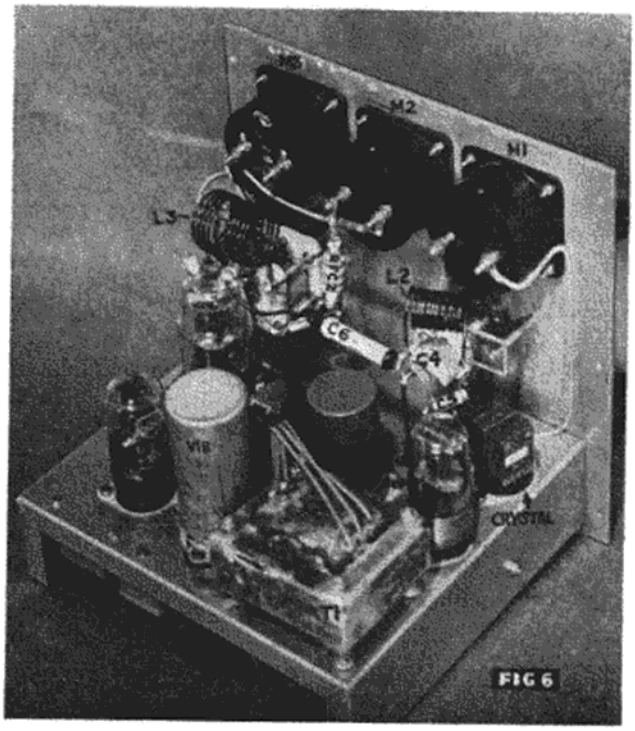
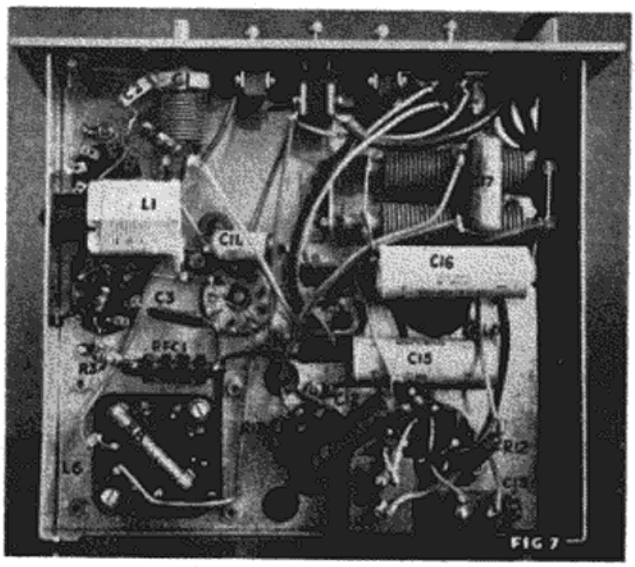


FIG 6



cated by M_3. On connecting the aerial the anode current will rise and it may be advisable, more particularly if the aerial is not an exact quarter wave length long, to retune C_8 slightly for *minimum* feed current to V_3. Under no circumstances should the input power to V_3 exceed 5 W, and a check should be made thus :—take the reading on M_1 (which operates as a 0-500 V meter) and the anode current to V_3 given by M_3, multiply the readings together, and divide their product by 1,000. The answer gives the input power to V_3 in watts.

For example : given M_1 reads 250 V
M_3 reads 18 mA

$$\text{Input power} = \frac{250 \times 18}{1{,}000} = 4.5 \text{ W.}$$

Should the input power be excessive, reduce the aerial coupling and check again. It will be found in service that when the soil is damp, more power is drawn by the aerial than when dry conditions obtain. The variable aerial coupling is thus a valuable feature, since it enables optimum performance to be obtained at all times.

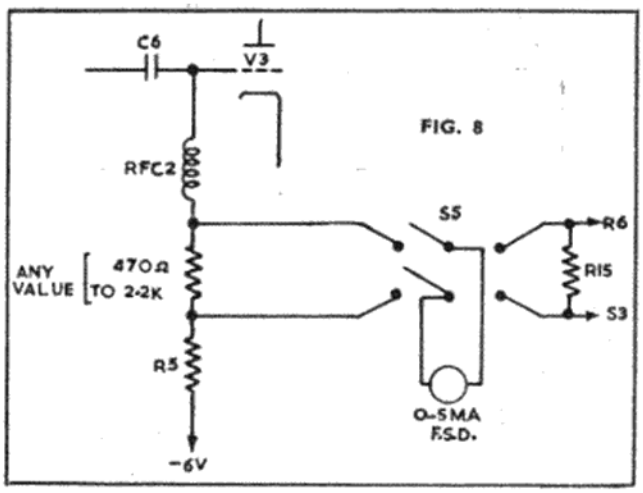


FIG. 8

COMPONENTS TABLE FOR THE S.H. TRANSMITTER

Components Required for Crystal Transmitter.

Coil Table

Identity	Turns	Wire	Inside Dia. in.	Length in.
L_1	16	24 en	1	$\frac{3}{8}$
L_2	10	16 en	$\frac{5}{8}$	1
L_3L_4	4	16 en	$1\frac{1}{8}$	$\frac{1}{2}$
L_5	1	16 en	1	

N.B.—L_3 and L_4 are spaced $\frac{1}{16}$ in. apart to provide clearance for L_5.

Resistors :—$\frac{1}{2}$ watt unless otherwise stated. Tolerance 20 per cent. unless otherwise stated.

R_1	150K	*R_9	8.2K $\frac{1}{2}$W
R_2	8.2K $\frac{1}{2}$W	*R_{10}	1.2 M
R_3	22 K	*R_{11}	470 K
R_4	2.7 K $\frac{1}{2}$W	*R_{12}	68 K $\frac{1}{2}$W
R_5	12 K	†R_{13}	150 $\frac{1}{2}$W
R_6	100 WIRE WOUND	†R_{14}	150 $\frac{1}{2}$W
R_7	39	R_{15}	50 mA shunt (see text)
R_8	100 K 2 per cent. 2W		

Capacitors

C_2	0.002 mF Paper 350V	C_9	10 PF ceramic
C_3	65 PF ceramic	C_{10}	0.002 mF Paper 350V
C_5	0.002 mF Paper 350V	C_{11}	0.1 " " "
C_6	45 PF ceramic	*C_{12}	0.05 " " "
C_7	Two pieces of 24 DCC wire twisted together for approximately $\frac{3}{8}$ in. (see text)	*C_{13}	0.5 mF Paper 350V
		*C_{14}	1.0 " " "
		C_{15}	8 mF Electrolytic 500V
		C_{16}	8 mF " "

(Capacitors continued)

†C_{17}	0.025 mF Paper 1000V	C_8	25 × 25 PF split stator (Eddystone CAT. No. 583)
C_1	100 PF airspaced midget		
C_4	50 PF " "		

Miscellaneous Items

REL.	Any small relay Low resistance winding about 20 ohms, to operate at 6V High resistance winding about 3,000 ohms, to operate at 2 or 3 mA.
M_1, M_2, M_3	0-5 mA F.S.D. meters M_1 in conjunction with R_8 reads 500V full scale. M_3 in conjunction with R_{15} reads 50 mA full scale.
RFC_1	Standard high frequency chokes
RFC_2	150 t 38 en wire on $\frac{1}{4}$ in. dia. dowel
Crystal	Obtainable from H. Whitaker, 10, Yorkshire Street, Burnley. Ask for frequency in range 8,990 KC/s to 9,093 KC/s
†L_6	10 H 50 mA choke
†REC	Selenium bridge rectifier 250V 60 mA
†T_1	Vibrator H.T. transformer 250V 60 mA
†VIB	6V non. sync. vibrator
†S_1	S.P.S.T. switch
S_2	S.P.S.T. switch
S_3	S.P.S.T. switch
*S_4	D.P.S.T. switch
J_1	Midget Jack

All items marked † are obtainable from Power Unit Type 21.

V_1	6J5
V_2	EF50
V_3	CV6
*V_4	ECC35, 6SL7

*May be omitted if auto key not required.

OVER THE COUNTER

Power model propellers are now being moulded in *nylon* by International Model Aircraft. The new series of Frog nylon props range in price from 1s. 6d. (6 × 4) to 3s. 3d. (10 × 6). The original series of Frog moulded props in cellulose acetate continue in production at drastically reduced prices—the 6 × 4 prop, for example, now costing only ninepence.

Nylon propellers, by comparison, are roughly twenty per cent. lighter and some one hundred per cent. stronger than props moulded from cellulose acetate and similar plastics.

* * *

Shell Mex have developed a new "Powamix" formula for diesel engines. This new fuel now contains additives, giving greater power output, and also includes ether, ready mixed. Price remains the same at 2s. 6d, per pressure can.

* * *

Frog engines currently in production are the "50," "150" and "500" (both glow and spark-ignition versions). The price of the "50" has been reduced to 45s. (including tax). Other motor prices remain the same.

* * *

Production of the Jetex *Hawker Hunter* kit has been delayed by circumstances beyond the control of the manufacturers. Originally advertised in our January issue, the first kits are now expected to reach the shops by the time this appears in print.

* * *

Considerable interest has been aroused throughout the aeronautical world by the release of first pictures of the new Handley Page H.P.80 crescent-wing jet bomber. A solid kit of this outstanding new aircraft is expected to be on the market within the next two or three months.

* * *

With the 3.5 c.c. "BB" Amco engine now in production again we understand that the new manufacturers—Aeronautical Electronic and Engineering—are well ahead with a revised design and may also be producing motors in other sizes.

* * *

After moving to new premises with enlarged production facilities, American Fox engines are now in full scale production again. They were temporarily off the market at the beginning of the year.

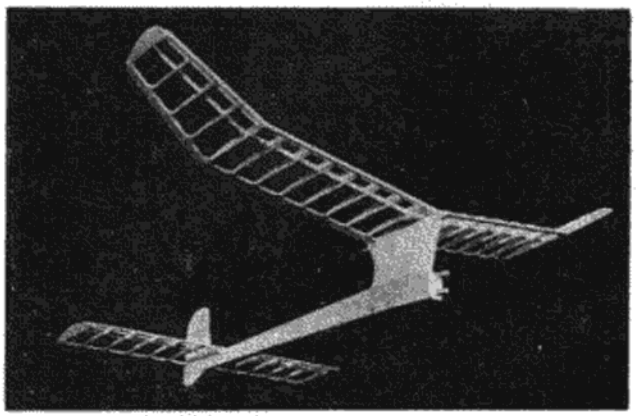
MODELCRAFTS

122, HIGH STREET, FALKIRK

Upon his demobilisation from the Royal Air Force in 1946 Mr. William Gibbs founded the Modelcrafts shop in Falkirk High Street. Since that time his business has expanded steadily and now has almost outgrown the existing premises. The shop carries a large stock of kits and materials to cater for the many branches of home hobbies Mr. Gibbs is a member of Falkirk and District Model Flying Club.

Where duration models are concerned, Mercury is showing a decided preference for diamond fuselage designs. Their latest rubber model, the *Mentor* has a diamond fuselage and built up pylon wing mount, very similar, in fact, to the highly successful *Marauder*.

Whilst we agree that such a layout is in keeping with the modern duration trend, a diamond fuselage is not the easiest type to build accurately. However, the *Mentor* will undoubtedly be an excellent "junior" model for open rubber contests.



Showing the general lines of the "Eliminator" power duration model reviewed on the facing page, this photograph is of the kit in the course of construction.

Wheeler's ELIMINATOR

Kitted by CHUCK DOUGHTY

UNDOUBTEDLY this is a kit which will have a tremendous appeal to power duration enthusiasts, producing an exact replica of the model which won the 1952 International Power Contest in Switzerland, and the Frog Senior Cup.

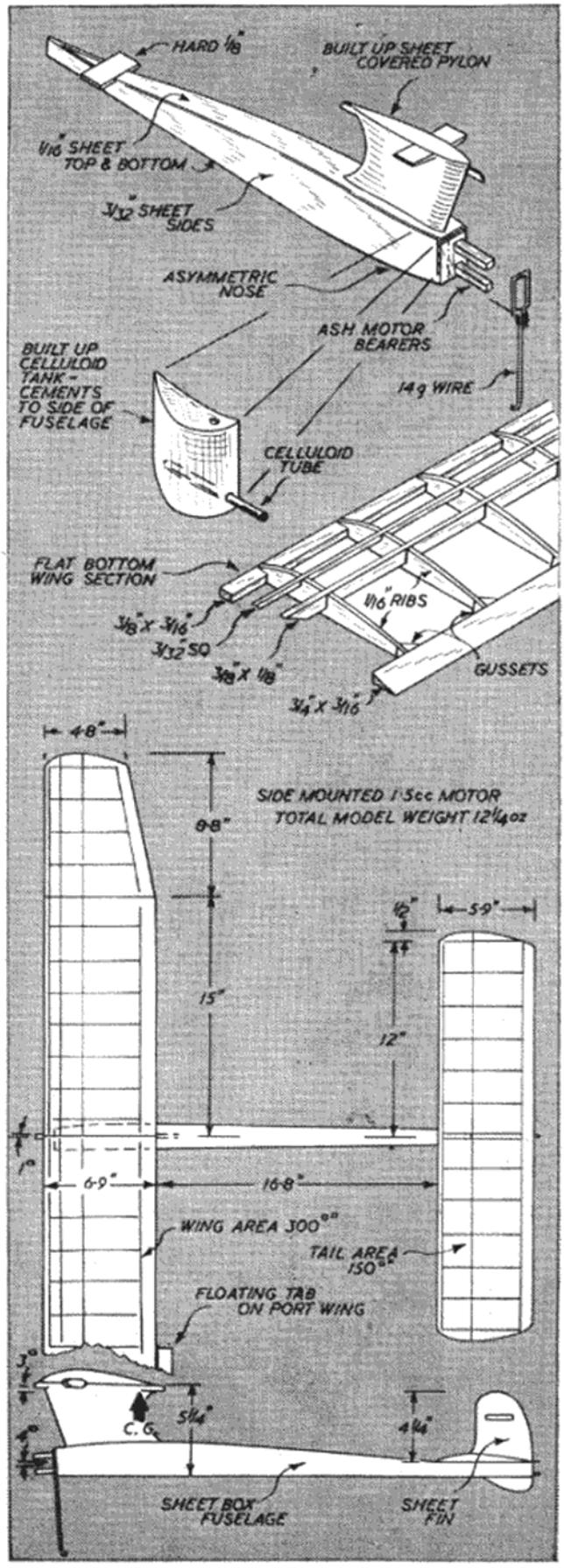
Of the model itself, little need be said. The contest record of the prototype has proved it to have an outstanding performance. As a matter of interest, the outline shape of the design is very similar (but with a longer moment arm) to that of the *San de Hogan*—a layout which has become almost a "standard" for the modern pylon model. Structurally the model is typically "English" in conception, with several neat detail design features, such as the detachable undercarriage, simple pylon construction, side-mounted motor, and so on.

Designed for 1.5 c.c. motors, the *Eliminator* is somewhat larger than the minimum size of model permitted under F.A.I. rules. This line of approach is undoubtedly better than working right down to the limits of the specification since, broadly speaking, the larger the model the better its aerodynamic efficiency and the less tricky it becomes to trim. Barry Wheeler has compromised very nicely between the advantages of the large size of model and the "minimum" size with its potential maximum rate of climb, and produced a design which any competent modeller, with reasonable experience in trimming, should be able to duplicate and work up to top contest standard.

The model is also rugged enough to stand up to normal hard usage and there is weight to spare to incorporate a clockwork timer, if preferred. Experience of the British team in Switzerland showed that the clockwork timer is more consistent and more reliable than its "airdraulic" counterpart.

The kit itself is nicely complete, with cut-out formers, pylon parts and sheet fuselage sides, but no covering material or cement. Shapes of these vital parts are quite accurate, although the pylon parts in the kit examined needed some slight trimming to correct height. The quality of the wood was generally excellent throughout. It would, however, have been nice to have found quarter-grain sheet included for wing ribs.

Metal templates are provided as a guide for cutting accurate wing and tailplane ribs from sheet. This is somewhat unique in a kit model and emphasises the fact that the kit is, really, a kit of a contest model for contest modellers, rather than a "commercial" power duration model design. Modellers used to kits with printed or die-cut sheet parts may find it a little difficult to appreciate the difference. In this they will not be helped by the fact that the plan is not strictly complete. There is no drawing of the wing ribs showing spar arrangement, for example, leaving certain features of the construction to the modeller's own ingenuity. Apart from that the plan is well drawn and informative.



Matching Engine and Prop.

By Robert Burns

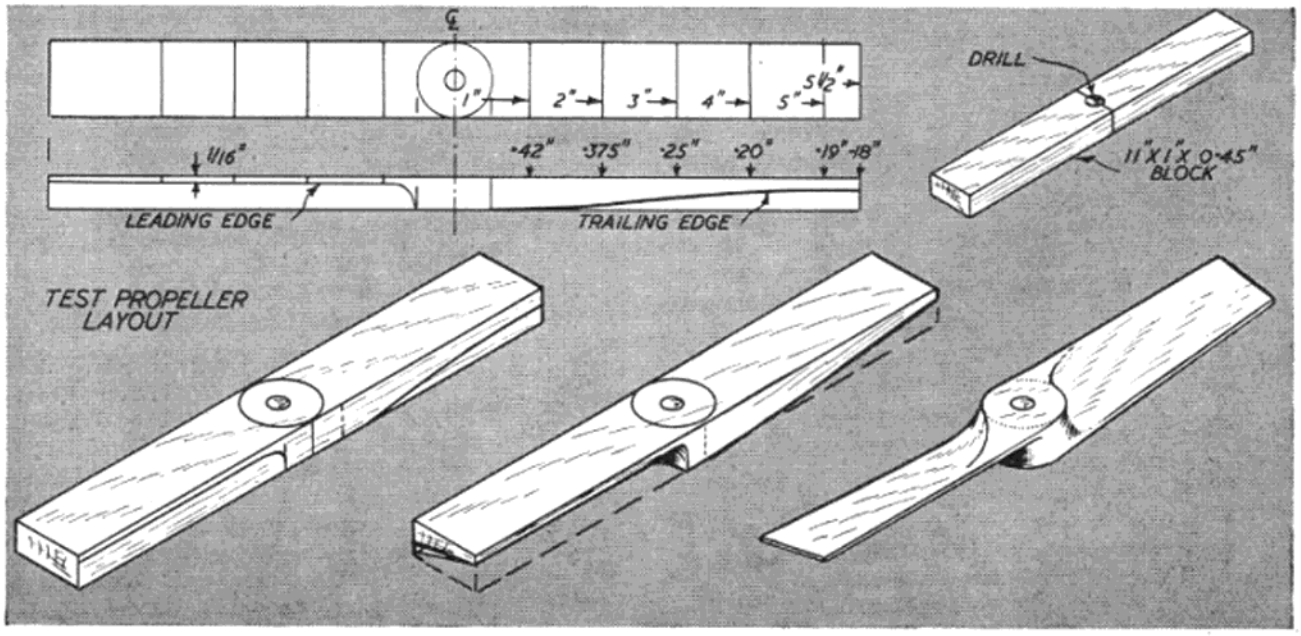
THE gang were in a state of turmoil, all over Jack's new engine. It was a 2 c.c. job, one of these new high speed diesels which are so light and fast, and he was eager to see what it could do. But since he had enough sense to know that the first hour's running is the one which decides how long it will last at top power, he had had the engine on the test bench with a large prop, running at only 4,000 revs. a min., with a fuel having extra castor oil in it. After an evening during which the 5 min. tank had been run dry over twenty times, we agreed that the insides ought to be polished to a nice mating fit with their opposite numbers, so that the bearings and other sliding parts would be free from tiny high spots, and it would not hurt to run the engine all out.

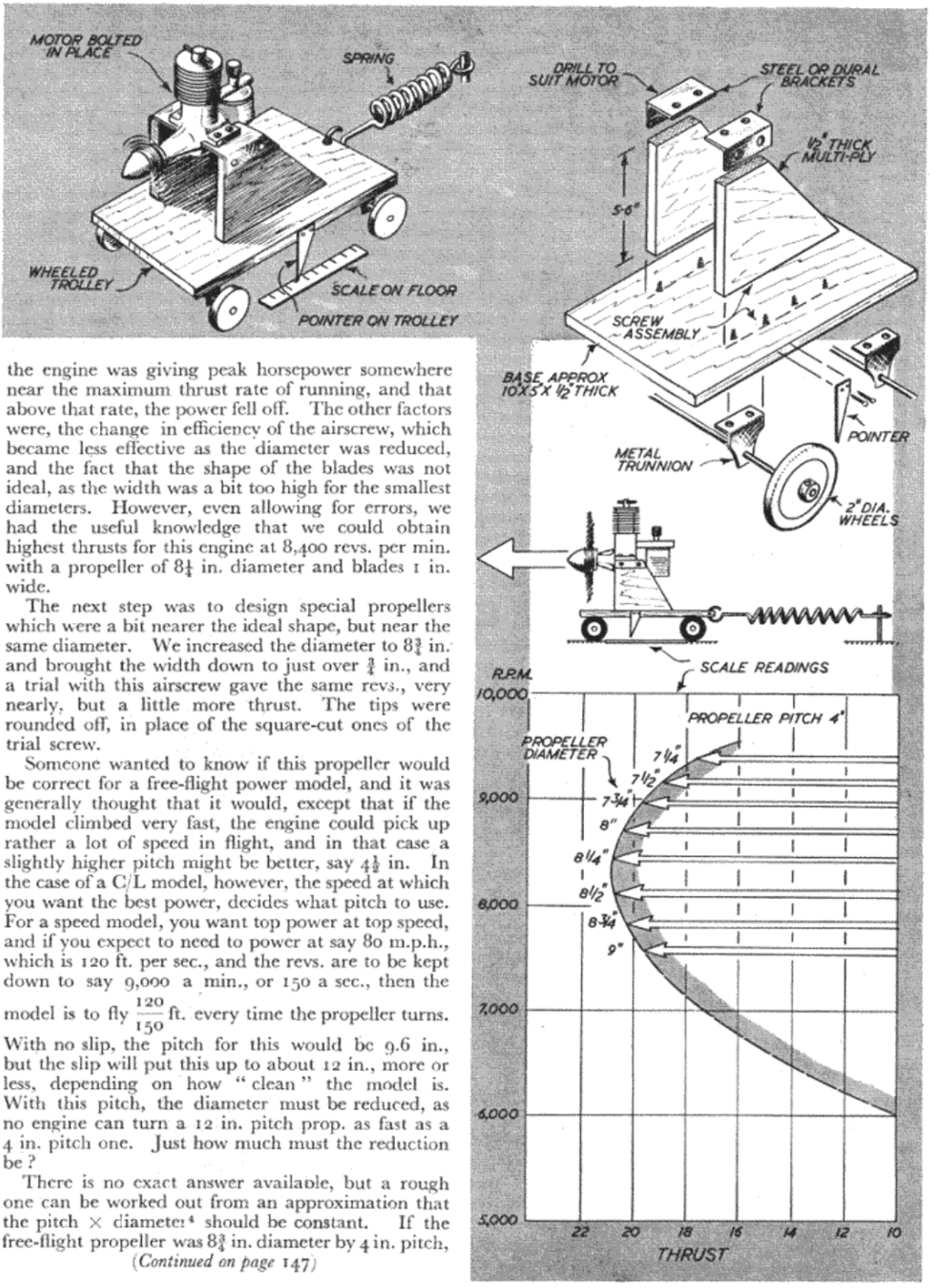
Then the question arose: what size of propeller should we use to get the best power out of the engine? It was a new type, and no power curves had been published for it, so that we couldn't calculate the size. Besides, the only member able to do the calculations was away on holiday. So one old hand, being consulted, came up with the following notion :

First of all, he took a short length of plank, and fitted two axles and four wheels, pinched from someone's Meccano set. Then two plywood brackets, a pair of bearers, and then the engine, the whole forming a sort of airscrew-driven bogie. Finally a spring balance was rigged up to the rear, and the outfit set up on the floor. He said that while there was a lot of friction when the thing was standing still, the vibration from the engine would give almost no friction at all, and instanced how aircraft instruments used to stick when fitted to jet aircraft, owing to the lack of vibration, and a small electric motor had to be fitted to the dashboard unit to provide some vibration and reduce the friction in the pivots.

With this set-up, he fitted a propeller carved from a bit of soft pine which was lying about. It was carefully made, of 10 in. diameter, and 4 in. pitch, and the blades were rectangular, 1 in. wide all along their length. The engine was duly run, and the revs. taken by a vibrating-reed counter, and the amount of stretch imparted to the spring marked. After three tests, the tips of the propeller were carefully trimmed off, reducing each blade by $\frac{1}{8}$ in., so that the diameter was now $9\frac{3}{4}$ in., and three more tests were run, taking the revs. and the thrust. If the spring balance does not stretch enough to give a good measure for the thrust, you can substitute a length of rubber, and rig up some pulleys and weights in a pan, to see what weight is needed to stretch the rubber to the same length.

After several sets of trials, it was noticed that the engine gained a great deal more speed as the diameter came down, but that the gain in thrust soon reached a maximum, and the thrust actually fell off after a certain engine speed, although the revs. increased. This is due to three factors, the main one being that





the engine was giving peak horsepower somewhere near the maximum thrust rate of running, and that above that rate, the power fell off. The other factors were, the change in efficiency of the airscrew, which became less effective as the diameter was reduced, and the fact that the shape of the blades was not ideal, as the width was a bit too high for the smallest diameters. However, even allowing for errors, we had the useful knowledge that we could obtain highest thrusts for this engine at 8,400 revs. per min. with a propeller of 8¼ in. diameter and blades 1 in. wide.

The next step was to design special propellers which were a bit nearer the ideal shape, but near the same diameter. We increased the diameter to 8¾ in. and brought the width down to just over ¾ in., and a trial with this airscrew gave the same revs., very nearly, but a little more thrust. The tips were rounded off, in place of the square-cut ones of the trial screw.

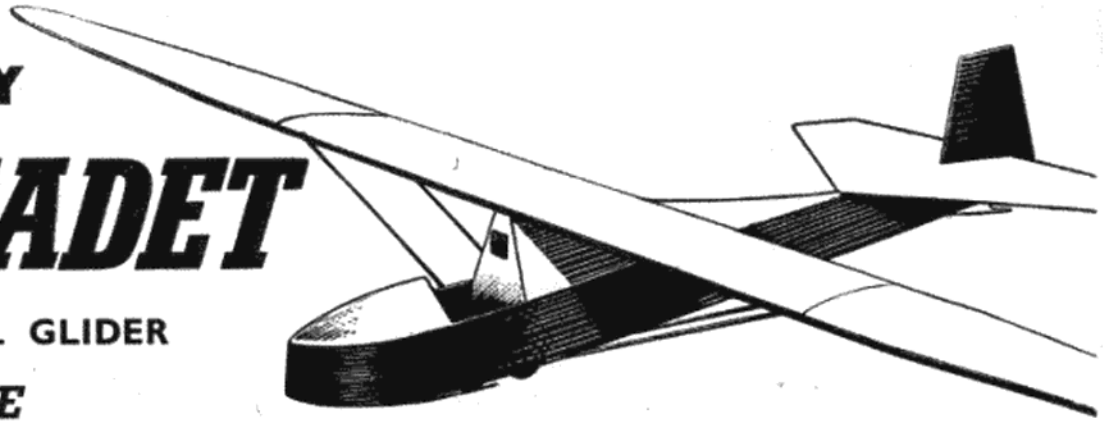
Someone wanted to know if this propeller would be correct for a free-flight power model, and it was generally thought that it would, except that if the model climbed very fast, the engine could pick up rather a lot of speed in flight, and in that case a slightly higher pitch might be better, say 4½ in. In the case of a C/L model, however, the speed at which you want the best power, decides what pitch to use. For a speed model, you want top power at top speed, and if you expect to need to power at say 80 m.p.h., which is 120 ft. per sec., and the revs. are to be kept down to say 9,000 a min., or 150 a sec., then the model is to fly $\frac{120}{150}$ ft. every time the propeller turns. With no slip, the pitch for this would be 9.6 in., but the slip will put this up to about 12 in., more or less, depending on how "clean" the model is. With this pitch, the diameter must be reduced, as no engine can turn a 12 in. pitch prop. as fast as a 4 in. pitch one. Just how much must the reduction be?

There is no exact answer available, but a rough one can be worked out from an approximation that the pitch × diameter⁴ should be constant. If the free-flight propeller was 8¾ in. diameter by 4 in. pitch,

(*Continued on page 147*)

THE KIRBY CLUB CADET

A SCALE MODEL GLIDER



By R. COOTE

THIS flying scale model of the Royal Air Force intermediate training glider combines strength with good looks, to produce a most realistic performance glider. It should be of interest to the scale enthusiast, who, until now has not had any design of a medium-sized scale glider or sailplane.

In building this model, it was found that no really efficient and strong method of wing attachment could be made without having the centre section permanently fixed to the fuselage—due to the layout of the actual machine. The answer to this problem therefore was to have an attached mainplane, with plug-in outer panels. The centre section was conveniently designed to incorporate permanently fixed struts which help to add rigidity to the wings.

Fuselage Construction

The fuselage is made up of $\frac{1}{8}$ in. balsa sheet sides, with formers 1-6 notched into them, which results in good strong construction which will stand up to rough handling on the flying field. Between formers 2 and 3 run two $\frac{3}{8}$ in. $\times$ $\frac{1}{8}$ in. bearers to accommodate the wing joint—these are built in flush to the sloped sides, and converge towards former No. 3. The fuselage backbone is cemented in the centre slot of former 3, and is fitted in, and cemented to formers 4 and 5, terminating at 6. The backbone is of $\frac{1}{8}$ in. sheet and cut to a depth of $\frac{3}{8}$ in.

The keel runs from the bottom of former 1, fitting into all the formers, terminating at No. 4. At the tail the converging sides are filled, top and bottom with $\frac{1}{8}$ in. wedges (9). The bottom one takes the 18-20 S.W.G. wire skid, while the top one has part 10 placed on it—to which the fin and rudder are cemented.

The wheel housing is made of two additional $\frac{1}{4}$ in. $\times$ $\frac{3}{8}$ in. sheet supports, cemented to each side of the keel between formers 2-3. These are sanded to the contour of the keel—also a piece of $\frac{1}{8}$ in. $\times$ $\frac{3}{8}$ in. strip is added to the inside of the fuselage sides, which later will be drilled to house the $\frac{1}{8}$ in. dowel struts, which are positioned $2\frac{1}{2}$ in. apart.

This section is now best covered with $\frac{1}{16}$ in. sheet, when the struts have been securely cemented.

A central stringer runs between former 1 and 1A on the nose, and a weight box is built in forward of the cockpit. Sixteenth inch sheet fills the top of the weight box, whilst a shaped piece of $\frac{1}{8}$ in. sheet is cemented in position for the bottom. The lid of this box can be so constructed as to fit in without cementing until the model has been trimmed.

The nose block is of solid balsa, or laminated sheet, and is sanded to its six-sided shape.

When covering the fuselage, it is best to cover the sheet sides also, to ensure a similar finish all over.

Wings

The $\frac{1}{16}$ in. centre section of the wing is built up of seven "A" ribs, of which the two outer of each side are drilled to house the drinking straw plug sockets. The outermost spars are flanked by $\frac{3}{8}$ in. $\times$ $\frac{1}{8}$ in. sheet, into which the wing struts will fit. The outer sections are straightforward, with $\frac{1}{4}$ $\times$ $\frac{1}{8}$ leading edge and $\frac{3}{8}$ $\times$ $\frac{1}{8}$ trailing edge, in common with the centre section. Care should be taken in drilling the holes in the two "A" ribs of each outer panel, which will take the $\frac{1}{8}$-in. dowel plugs, to ensure that they line up with the socket holes. These dowel plugs should protrude 3 in., as well as passing through two spars—to ensure a firm fit.

The inner panel immediately each side of the centre rib of the centre wing section, should be covered on the underside with $\frac{1}{16}$ in. sheet for added strength, as on a heavy wingtip landing it is this section which will take the stress. Also it is strongly advised to reinforce former No. 3 with an additional sheet of $\frac{1}{8}$ in. balsa, to strengthen the fuselage/wing joint.

Tail

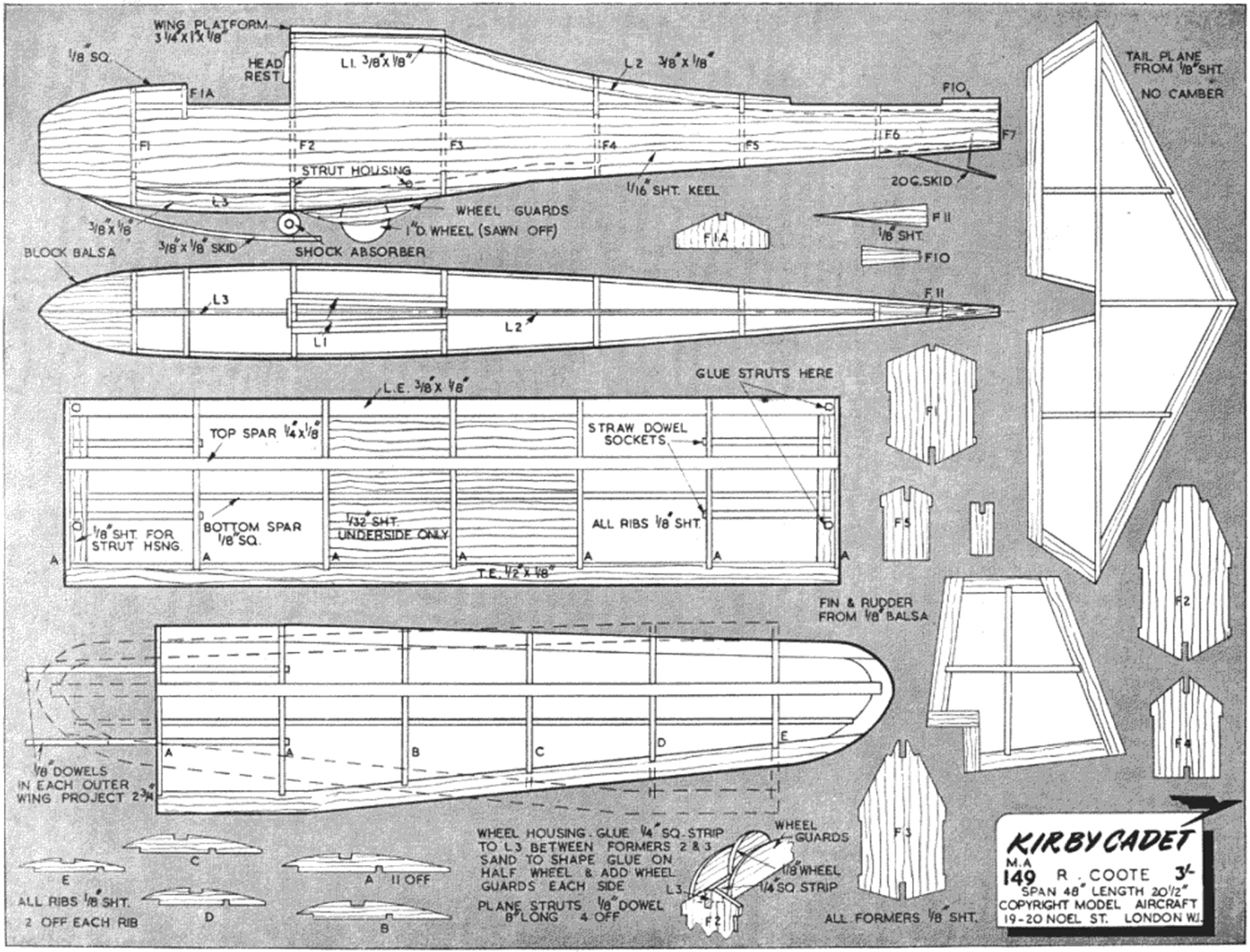
The tailplane, fin and rudder have no aerofoil section at all, except for the usual rounded leading edge and tapered trailing edge.

The tailplane is cemented to part 9, the forward point fitting into the step of the backbone; the fin and rudder are cemented to part 10, and the rear of the fuselage.

Assembly

Having covered the fuselage and the centre wing section, these two should be joined by cementing thoroughly, and fitting the 8 in. struts—having drilled holes at the appropriate angles in the fuselage sides and the centre section tips.

The leading edge is set forward of former 2 by $\frac{1}{4}$ in. The forward strut should join the fuselage at, or immediately behind former 2, and fit in the wing $\frac{1}{4}$ in. from the leading edge.



Model Talk

By Bill Dean

Ron Chacksfield and his Eta 29 T/R—a Davies Trophy entry.

● NEXT TIME you start thinking how good you are getting at building and flying model planes, the surest way of making your ego lose altitude is to take a look at the way the birds are making out. Of course, models can fly faster than birds, but that is a minor accomplishment beside the precision and grace of a swallow or the cheeky aerobatics of a sparrow. With this in mind, we decided to lead off this month's "Model Talk" with a few notes (thanks to *Shell Aviation News* for much of the data) about our feathered friends—which we hereby dedicate to Gus, a bread-crumb-addicted robin who spends most of his time pushing up his wing loading at our workshop windowsill!

Birds obtain most of their lift from the centre portion of their wings—which move least during flight—whilst forward speed (and some lift) is supplied by the twisting motion of the tips, which beat the air downwards and rearwards. It takes plenty of energy to achieve flight by flapping, which accounts for the amazing appetites of most birds. A bird's wing-flapping muscles account for up to a quarter of its total weight and the heart about a tenth. The rate of breathing goes up sharply after take-off—one estimate (for a pigeon) putting it as high as fourteen times. Feathers are renewed annually and serve the dual purpose of aiding flight and conserving heat.

The main bones of a bird's wing are tubular in section and have an outstanding strength-weight ratio. John Barlee, a well-known naturalist, has carried out load tests with a 9 in. long wing bone of a gannet, which he supported on wooden blocks at the extreme ends and then suspended weights from the centre. Before the bone (which weighed 2/3 oz.) snapped, no less than 127 lb. had been applied.

Sid Allen and his R/C Gypsy "Moth"—an original design powered by a spark-ignition Triumph 49.

In addition to varying their wing area, dihedral and sweep-back at will, birds are also able to delay the stall by raising feathers set in the leading edges of their wings—much in the same way as aircraft slots function. These feather "slots" are particularly developed in low aspect-ratio wings (vulture), but are almost non-existent in high-aspect ratio wings (albatross). Advanced gliding birds fall into these two main sections—the former making use of thermal upcurrents to maintain and increase height, while the latter rely on the differences in speed between layers of air near the ocean surface.

Fastest flight is achieved by the peregrine, which is known to exceed 100 m.p.h. in a dive. The swift lives up to its name by sometimes touching 80 m.p.h., while the corpulent pigeon surprisingly knocks up 50 m.p.h. once it gets its undercart tucked well away. Gulls and swallows can reach 35 m.p.h. and the humble sparrow tears along at 20 m.p.h. flat out.

Many birds cover vast distances during their lifetime—it having been claimed that arctic terns fly more than 20,000 miles annually. If you think that's a lot of flying, take note that an estimated mileage for the swift is ten times that amount. Highest flying bird is probably the Andes condor, which reaches 25,000 feet. However, few other birds venture above 2,000 feet, except when crossing mountain ranges on migration flights.

One of the most unusual birds in existence is the golden-eye, a fast flying duck, which can dive into water and swim equally well on or below the surface. Then there is the razorbill, a clipped-wing job whose flying days are definitely numbered. The wing area of this type is steadily becoming smaller, with the result that it has to push up its flying speed by flapping harder and harder. This naturally calls for stronger flying muscles, which means more weight, which in turn necessitates harder flapping and still stronger wing muscles. The long and short of all this being that it is only a question of time before the razorbills start getting corns on their feet like their grounded cousins the ostriches and penguins!

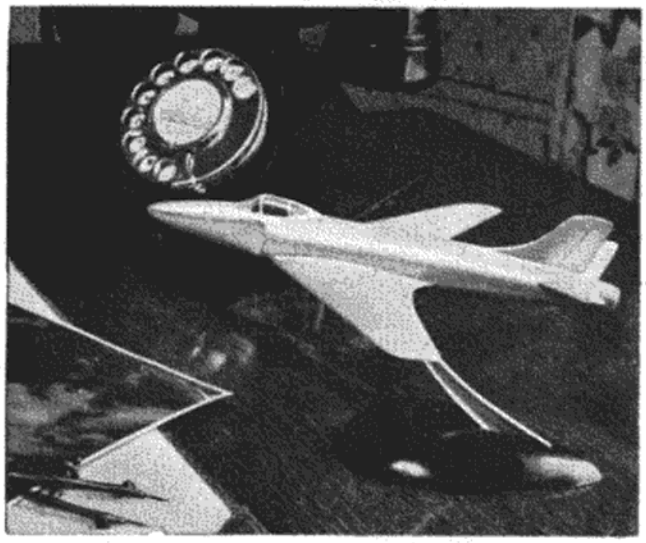
" Brabazon " of the bird world is the swan, which manages to get airborne only after a long taxi across the surface of a lake or pond. Strangest bird in existence (?) is the oozlum—which was discovered by R.A.F. flying types during the last war. Its habits—which include flying in ever decreasing circles—are, to put it mildly, both spectacular and embarrassing.

Finally, let's say goodbye to birds and take a quick look at bats and flying fish. The former carry around their own radar systems, which is a good thing for them, since they suffer from extremely poor eyesight. Sounds are emitted through the bat's nose at a very high frequency ; the echoes being picked up by its ultra-sensitive ears and the time lag enabling the creature to ascertain its distance from any obstacles. Contrary to popular conception, flying fish *do not* flap their wings like a bird. What actually happens is that they emerge from the water at about 20 m.p.h., extend their wing-like fins and accelerate rapidly by vibrating their tails (which remain in the water) until a speed of about 40 m.p.h. is reached, at which point flight is attained. From then on gliding continues until momentum is lost. Flights seldom last for more than a few seconds, since their wing (or fin !) loading far exceeds that of any flying bird.

★ ★ ★

● RECENTLY WE spent a fascinating day looking round the largest balsa wood factory in the country—the home of *Solarbo*, at Lancing, Sussex. Never did we expect to find so much balsa under one roof—or see the beautiful stuff being used for such a wide variety of purposes. Our host was J. V. Paterson, who told us that his firm handles something like a thousand cubic feet of balsa every week.

As we were shown round the factory, it soon became apparent that the model aircraft industry is only one of the many users of balsa. Mr. Paterson told us of recent experiments with fabric-coated sheet balsa, which have opened up a whole new field of uses—such as suit-case frames, light-weight containers and novel developments in prefabricated kits. It must be news to many readers that balsa also comes into its own as " separators " for miner's lamp batteries and as floorboards (when faced with corrugated aluminium) for cars and aircraft.



This KK solid " Swift " built by E. J. Webster makes a good desk ornament. Stand is by the writer

Pete Wright and his " Wrangler " team racer (B). Eta 29 powerplant flies it at 100 m.p.h. plus.

Balsa wood has proved an ideal material for surf boards in view of its extreme lightness and buoyancy —a fact borne out by the large numbers of balsa wood lifebuoys and floats that were made during the last war. A 4 ft. balsa surf board (with a waterproofed high gloss finish) at present being manufactured by *Solarbo*, weighs only 3 lb., yet will easily support the weight of an adult in water.

One of the most interesting items we saw being made at the factory was a lightweight aluminium/balsa container, which consisted of ¼ in. sheet balsa sandwiched between .010 in. aluminium sheets, with pressed aluminium end pieces. The finished article weighs under 2¼ lb. and will withstand an external pressure of 400 lb. without distorting.

Balsa is gradually being " discovered " by many firms, as the ideal protective packing material for such fragile objects as detonators, radio valves and bottles of scent—to name just a few. Its advantages for air freight purposes are obvious when we learn that a sturdy container of 3 cu. ft. capacity can weigh as little as 6 lb. It seems that balsa is at last becoming widely known outside modelling circles, which is a very good thing from the model builders point of view, since the more widespread use of balsa is certain to bring down eventually the prices of strip, sheet and block.

★ ★ ★

● WE MET a couple of exiled teenage American model enthusiasts at the flying field the other day. It appeared that they thought British kits were wonderful—not like the ones they used to buy in the States, where everything down to the last wing gusset was prefabricated. " You've no idea," they told us, " of the fun we have cutting out sheets of printed

(*Continued on page* 143)

1953 WINTER CONTESTS

The Bill White Cup Contest (rubber duration) and the Blackheath Winter Glider Gala, organised by the Blackheath M.F.C. at Epsom

After the foggy and generally depressing weather of the previous weeks, the Blackheath M.F.C. was lucky enough to have a fine though windy day for their annual winter gala. Bright sunshine and the crisp wind made running around after models a real pleasure. There was really substantial support for this well organised meeting, too. Some 26 clubs were represented, including entrants from Ipswich, Leigh-on-Sea, Gravesend, Bournemouth and Brighton. 87 competitors entered for the Bill White Cup, and no less than 137 for the open glider contest.

BILL WHITE CUP

			min	sec.
1.	G. J. Over ...	Hayes	7	34
2.	J. A. Gorham	Ipswich ...	6	46
3.	B. V. Rowe ...	St. Albans ...	6	24
4.	E. Bennett ...	Croydon ...	6	19
5.	M. Green ...	Men of Kent ...	6	11
6.	D. Regwell ...	Upton ...	6	10

WINTER GLIDER GALA

			min.	sec.
1.	D. Yeabsley ...	Croydon ...	7	54
2.	T. Hancock ...	Surbiton ...	7	8
3.	J. Butt ...	Regents Park ...	6	52
4.	P. Holloway	Brighton ...	6	41
5.	J. Lamble ...	Wayfarers ...	6	30
6.	E. J. John ...	Grange ...	6	12

Top right : J. Baggett (Crystal Palace) launching in the Bill White contest.

Above left : J. Macdonald and A. Dorset of Blackheath found scorekeeping a cold job! The Bill White Cup stands before them.

Above right : Roy Yeabsley launches the same Wakefield he flew in Italy.

Left : The helpers go into action as C. Marsh of Ilford winds up.

Right : A tense moment as John Gorham of Ipswich unhitches the winder hook.

Top left : Harry Brook of the Zombies launches for fellow club-mate John Snewin.

Top right : J. Owen, late of the Blackpool club, flew his Wakefield as a member of the Thames Valley M.A.C.

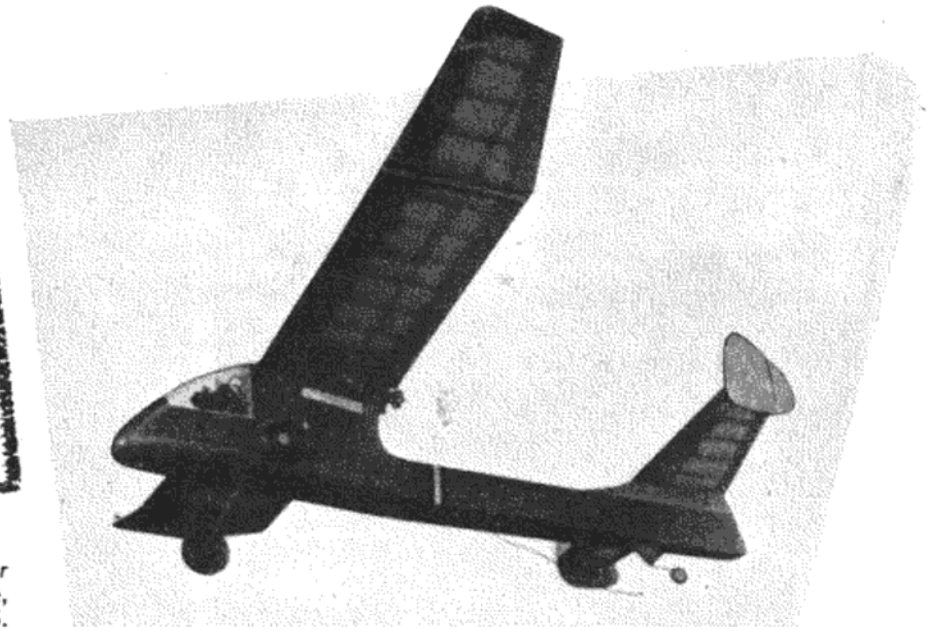
Left : P. Allaker, of Surbiton, flying in the Bill White contest.

Right : M. Shepherd, of Epsom, test-gliding his "Toothpick" A2.

Below left : K. Churchill of Blackheath, does some field repair work in the Blackheath club's camp.

Below right : E. Bennett, of Croydon (4th), carefully fits the nose-block into place before flight.

Are you receiving me?



S./Ldr. Cable's "Cats Whisker II." Weighing 6½ lb., airborne, powered by an Amco B.B. 3.5.

ACCENT ON POWER
By
P. G. F. CHINN

ONE of the problems connected with R/C flying is the need for an understandable and adequate method of communication for ground-range checks.

The methods usually employed seem to involve considerable arm waving and the only signal of any universal significance—raising the arm, either horizontally or vertically, to request a "key" from the transmitter—is quite inadequate except for the most simple check. Nowadays, with the possibility of multiple controls, either by means of reeds or compound actuators, a more comprehensive ground signalling code seems to be particularly desirable.

This need was brought home quite forcibly to the writer and a friend last year when operating a large R/C glider. A towline some 1,200 ft. long was being used, in conjunction with a shooting-brake for towing up. In calm weather this meant that the model was positioned six or seven hundred yards from the transmitter, at the start of the tow, and any misunderstandings between launcher and operator meant a very long walk to sort things out. To make matters worse, it was very difficult to see a raised arm at this distance against an airfield boundary of trees.

Various supplementary signals were tried or contemplated, including the use of a car spot-light and a mid-way signalling point, but it had long since been evident that the problem would have to be tackled properly and a complete code of signals worked out. And what better basis for this than the International Code of Signals?

In this, of course, we have the choice of International Code flags, semaphore or morse. Single letter code flags might, at first sight, appear to be the best method, but has the disadvantage that their pattern would be difficult to see due to the line of sight being in most cases, parallel with the wind. Morse would require the use of a daylight signalling lamp during bright summer weather, and at the longer ranges, and it was also thought that morse signalling, even of the most elementary nature, would not be very suitable when employing a helper with no previous experience of using a morse key.

Semaphore seemed, to the writer, to be the best choice. Half-a-dozen or so signals can be quickly learned and easily understood by this method and the only equipment required is a couple of pairs of semaphore flags or, if preferred, simple plywood "bats" painted yellow. The latter, in fact, would be better for our purposes due to wind direction and strength.

The choice of the actual code letters to be used needed some thought. It was desirable to keep them as distinctive from one another as possible, so that any careless or "unseaman-like" signalling would not cause too much confusion. Secondly, it was thought advisable to use mainly those signals involving arm movements at, or above, shoulder level. Signal stations, either on land or afloat, are invariably placed high, where the lower flag positions can be seen, but in our case, a slight intervening hillock, or even long grass, may render the distinguishing of such letters as "A," "G" and "N" rather difficult.

Eventually, the six basic signals shown were chosen. They can, of course, be added to later, if need be.

The first one, the "Attention" sign, was a natural choice. It consists of a regular movement of the flags, as shown, and can be used either by the operator or by the launcher. For example, the launcher, when he reaches the take-off or check point, will call up the transmitter operator in this way. The operator will switch on the transmitter and take up the keying switch and give the answering sign "C" with the right arm as shown.

The launcher's next request will, probably be for a continuous radio signal so that he can check the receiver standing current and make any tuning adjustments necessary. For this he will raise one

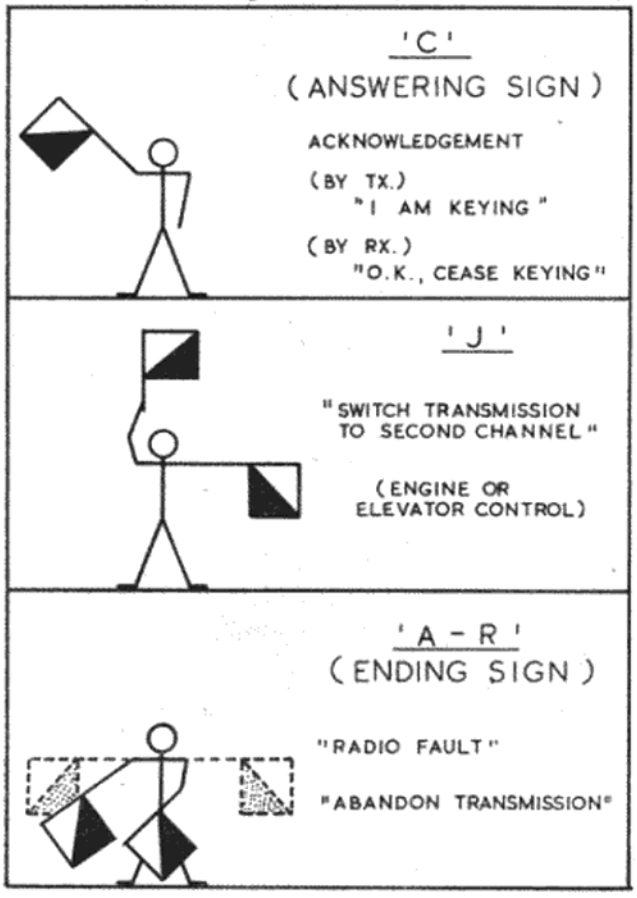
flag straight above his head, lowering it when he sees the acknowledging " C," indicating that the transmitter is sending the required signal. To cancel this transmission, the launcher simply gives the answering sign " C."

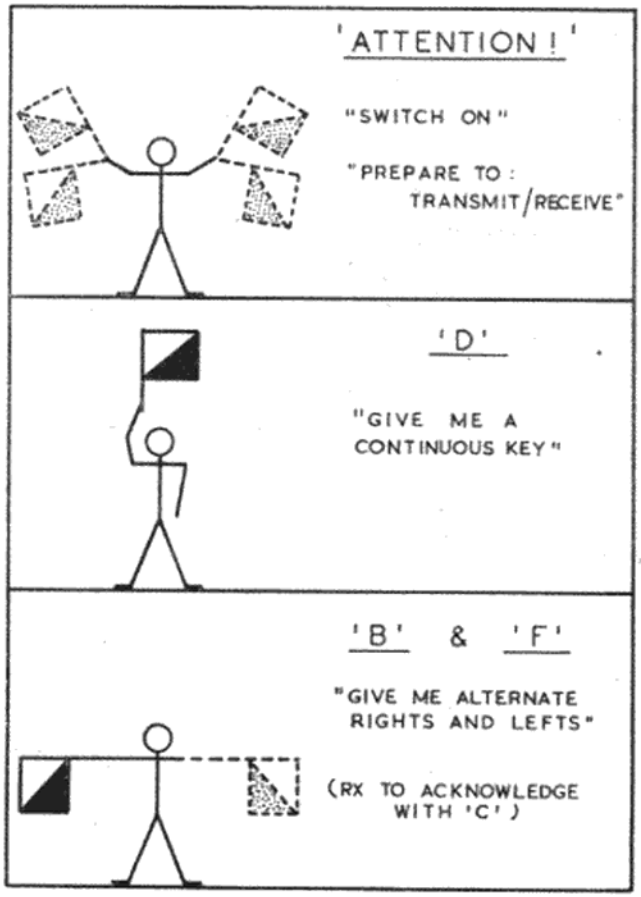
To check rudder operation, the launcher can then give a simple extended arm signal (" B " and " F ") for right and left rudder, indicating that he requires an intermittent signal. (Actually, one arm extended will do, for example, " F " only, unless a selective control is employed.)

With all semaphore signals, the person receiving them should always give the answering sign " C " to acknowledge that each is understood and that the request made is being carried out.

If no answering " C " is received, the sender should repeat his signal. If an answering " C " is received but the corresponding radio signal is not, the sender should also repeat his semaphore request. In this way, the existence of a radio fault or other breakdown will be indicated and if this cannot be quickly rectified, " A-R," the ending sign, can be made, which will inform either party of trouble and thus avoid unnecessary waste of time.

The precise action to be taken on receiving the ending signal " A-R," can be worked out for individual requirements. Sent by the launcher, for example, it could be interpreted as " Radio fault. Abandon transmission until I call you up." In the case of the transmitter end, it could read : " Transmitter fault. Return to base." This ending sign is made by sending, alternately and continuously,





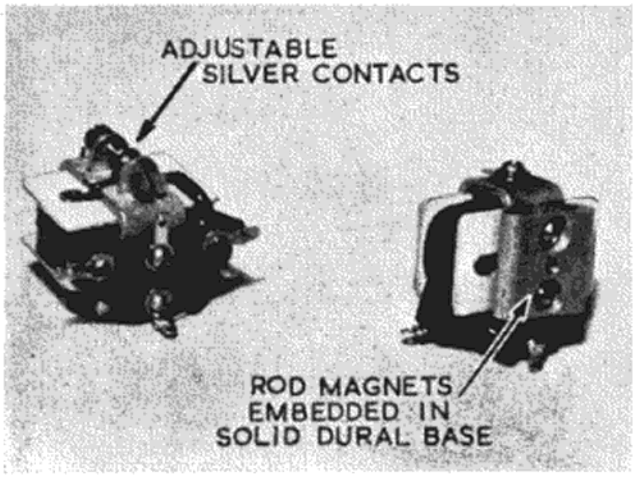
the signal " A," which is approximately a " twenty-to-six " position of the flags, and the signal " R," which is a " quarter-to-three " position.

The remaining sign, " J " only applies to models equipped with secondary control channels ; for example, an elevator or engine control. With this signal, the transmitter operator can be instructed to switch to the second channel for a further check following the same procedure as before.

It will be noted that only at the beginning or end of each semaphore session is more than one flag actually needed. This means that, where the launcher has no helper at his end, his other hand is free to hold the model, avoiding the necessity of putting it down every time he wishes to make or acknowledge a signal.

In the case of a glider, where the model is actually launched from this distant point from the transmitter, a signal is necessary to indicate that the model is ready for towing aloft. However, this need not involve the use of the flags. The launcher can simply hold the model high above his head as a signal to the man on the other end of the towline that he can commence his run.

We do not suggest that the signal code we have described should necessarily be adopted universally, but we do feel that it could do much to eliminate some of the frantic running about between model and transmitter often seen and could speed up operations, avoid misunderstandings and unnecessary accidents due to impatience.



The E.D. polarised relay.

The code could, no doubt, be improved on; it is merely one person's idea at present. Perhaps, with some further suggestions, it could prove helpful to the general betterment and enjoyment of radio-controlled model flying.

To assist the ground crew, we would suggest gumming a copy of the code on top of the transmitter case and, perhaps, on the side of the model too. Service teaching of semaphore signalling, incidentally, insists on clearly made angles with the arms well extended and this is something worth observing in our case for, although, as we have previously stated, most of the signals we have chosen are quite dissimilar, carelessly made " C's " or " D's " could be confused.

Incidentally, there is one other signal which might also be profitably used. This consists of sending a succession of " E's " and its purpose is to inform the receiver that an error has been made in the previous signal. The corrected signal is made following the " E " signals. " E " is made by raising the left flag at a 45 degree angle—that is, the equivalent of " C " but made with the left arm instead of the right. To send successive " E's " the flag is simply raised, returned to the " 6 o'clock " position, raised again, returned and so on.

We have mentioned multiple controls. Probably the most practicable method of obtaining additional controls from present single-frequency equipment is by means of a tuned-reed type selector unit. Tuned reeds are not new to models, of course. One of the earliest R/C attempts by a practical modeller (Leo Weiss of the U.S.A. in 1937) used such a method of control and the American Rockwood concern has a five-channel outfit of this type.

At home, Electronic Developments Ltd., of Kingston-on-Thames are, of course, now marketing a three-reed receiver, the Mark 4, based on their well-tried three-valve modulated carrier wave circuit. This is available as a complete outfit, including transmitter and control-box, or, if preferred, the reed selector unit itself can be purchased separately.

This unit is remarkably compact, the actual body, excluding wires and tags, measures only 1½ in. long by 1 in. square. It will fit into a space 1¾ in. × 1¼ in. × 1¼ in. The unit is available in two types, having different frequency ranges. They can be distinguished by the colour of the coil covering: red being for the high-frequency type, green for the low frequency. Using both types, with coils in series in the output valve anode circuit will enable up to six separate control channels to be used.

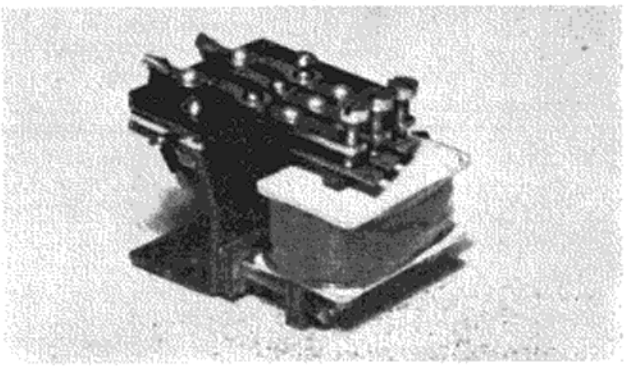
Details furnished in the comprehensive booklet issued with each reed unit include transmitter and receiver gen. and cover circuit diagrams, method of tuning and adjustment and suggested operational layouts for aircraft or boat control. The complete unit, incidentally, weighs less than 2 oz.

Also used in the Mark 4 receiver are E.D. polarised relays. This relay, too, is quite light, being a bare ounce in weight and no bigger than standard relays. The writer has sent one or two of these relays to friends overseas who have expressed satisfaction with them. They are compact and stiffly constructed and appear to suffer less from vibration than most other types. There is a positive form of contact adjustment, the adjustable contacts being cheese-head 6-B.A. screws with domed solid silver ends.

Cats Whisker Mk.II, the interesting looking pusher R/C model illustrated, is the work of Sqd.-Ldr. Eric Cable, secretary of the R.A.F. Model Aircraft Association, and now stationed in Malta.

Many readers will, no doubt, remember Sqd.-Ldr. Cable's original *Cats Whisker* which was another out-of-the-rut design and used the same 75 in. × 11 in. wing with high mounted engine, although arranged as a tractor. The earlier model, constructed in 1949, was the builder's first R/C venture and had a number of interesting features. It was powered by an Ohlsson " 29 " petrol engine driving a four-bladed prop. The wing was virtually pylon mounted on a large cabin structure which housed the receiver. Unfortunately, the model came to an untimely end when it dived into the runway from an estimated 160 ft. Sqd.-Ldr. Cable spent some time picking up small pieces of balsa and regretting the while that he had not found time to enlarge the fin area.

Still scorning conventional layouts and with a commendable display of pioneer spirit, he then embarked on an even more unorthodox design, the present *Cats Whisker* and, by way of reward, this twin-



The E.D. tuned-reed selector unit.

finned pusher has shown excellent flying characteristics.

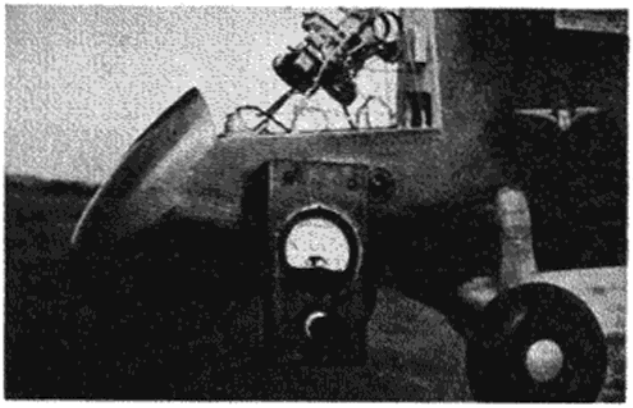
Mk. II has been flown with the Ohlsson "29" (5 c.c.) and on a 3.5 c.c. B.B. Amco and, at a loaded weight of 6½ lb., this incidentally, is a fair commentary on the capabilities of the latter engine. Different receiver and battery combinations have also be used, including a Good Bros. receiver and a home-made 1S4 valve receiver. The purpose of the twin fins and rudders was to obtain equal response with power on or off and this has, in fact, been achieved. One feature which is a considerable improvement on the normal cabin layout is the accessibility of the receiver, conveniently located under the transparent nose section.

The latest aspirant to cross-Channel R/C honours is Johnny Gorham. When Gorham mentioned this at a line-shooting session last year, there were grins all round, with "What, again that joke?" "Oh, no! Not you too!" etc., etc., until, in mock exasperation, Johnny turned to the writer and said: "All right! You can quote me."

Brave words . . . E.D.'s Channel crossing with an R/C model launch was a notable achievement. Flying a model aircraft across will be infinitely more difficult. It is one thing to keep a model boat a few lengths in front of the bows of a tender on a set course (and even this did not turn out to be a simple matter in the E.D. effort) but quite another matter to direct a relatively fast-flying model aircraft on a straight *and level* course. Additionally, it will call for quite a fast following craft.

Nevertheless, so far as the technical considerations are involved, Gorham is, we feel, one of the few people capable of overcoming the difficulties presented. One of our reasons for this belief is his capacity for packing in more work (and fruitful work too) in a limited time than anyone else we know. To take an example. Last summer we

Flt.-Lt. Costello, of R.A.F. Watton, Norfolk, with his fine crystal-controlled transmitter.



The nose of "Cats Whisker Mk. II" showing excellent accessibility to 1S4 receiver and with milliammeter plugged in.

lent Gorham a plan of the *Super Brigadier* when he expressed interest in the model after reading our comments on it in MODEL AIRCRAFT. In *ten days* of spare time, he built the model *and designed and built a receiver, escapement and transmitter to go with it*! This, despite the fact that some scoundrel at the All-Herts Rally filched the contents of his model box, including the plan of the then half-built *Brigadier*, so that Gorham had to build his wing and tail surfaces from the data and small three-view drawing in our article.

Moreover, his radio equipment, judging by the single demonstration we have so far seen of it, seems to be outstandingly good, particularly the transmitter which, by field strength meter readings, turned out to have a performance superior to that of far more expensive equipment against which it was checked at our club field, including the most elaborate commercial transmitter currently available in Britain.

Thank goodness we were able to find something to criticise in our Ipswich rival's efforts! This was his trimming of the *Brigadier*. This design, if built according to plan, is usually under-elevated. Gorham had corrected this with an increase in wing incidence and, as a result, had used a great deal of down-thrust to try to kill excessive climb and increase penetration —unsuccessfully. Defending the *Brigadier*, we claimed that all it needed was an increase in the negative tailplane incidence angle and no downthrust. Ensuing argument lasted two hours. A couple of weeks later Johnny phoned to invite us to an R/C stunt contest . . . and cautiously admitted that we had been right. . . .

We just had to get this in. One up to the writin' blokes, you see. Anyway, this is a point well worth bearing in mind by anyone building one of these models (and the design has aroused quite a bit of interest) or any other similar layout, for that matter. With a coarse angle of attack and a lot of downthrust (when using a good 2.5 c.c. motor) the *Brigadier* becomes relatively sluggish, stalls out of turns and wallows about. With the right trim it is faster and more sensitive, but far more responsive (and thus safer), stunts infinitely better and also penetrates a stiffer breeze.

KEEP IN THE PUBLIC EYE

By W. Turley

OCCASIONALLY we read in the model Press of clubs disbanding owing to lack of support, lack of a decent field, or some other reason. Sometimes they make a "comeback," sometimes not, but one fact remains—to hold a club together requires hard work, imagination, drive and good publicity on the part of the committee members.

But do not think the matter ends there. This energy and thought expended by the committee counts for very little if it has no backing from the club members as a whole.

Perhaps the hints and tips that follow, based upon my own club's activities may interest and even I hope, help other clubs in this matter of keeping in the public eye.

I should think that, next to the secretary, the most important member of the club is the press officer or P.R.O. He is the salesman of the movement and should see that the utmost publicity is given to the activities of his club, through the medium of the local Press and the model Press.

Now the local Press is always willing to give an active club a helping hand, and it is a good practice to have a talk to the reporter or office manager on this subject. He will publicise your displays and exhibitions in advance and give a good write up when the event occurs, even to the extent of getting a press photographer on the job if possible. If this is not possible, you may have a keen amateur photographer in the club who turns out some good prints of club events—the local Press may include his pictures in reports to the mutual benefit of both, club and photographer. These prints should never be less than 6 in. × 4 in., larger if possible and glossy. During last season my own club was given regular space in the local newspaper plus two full front page spreads of pictures taken at displays.

Wherever possible, submit a fully written report to the press office stating all details. Don't be stodgy in your phrasing but try to give a twist to your writing. A report of a C/L show could read :

. . . produced for all classes . . .

"The ——— Model Club gave an interesting display of C/L flying at the ——— field on Sunday . . . ." But how much more interesting this becomes to the general public when presented as :

AIR BATTLES OVER MUDDLECOMBE

"On Sunday, Muddlecombe was the scene of violent air battles fought out by model planes flown by members of the Model Club. Over five hundred spectators were thrilled as these tiny machines, controlled from the ground by wires, looped and dived. . . ."

Remember that the newspaper is produced for all classes of people and not for modellers only, and adjust your writing accordingly.

News letters to the model Press, however, will be read only by other modellers and so can be made more technical and contain items which would normally be of interest only to other modellers.

Getting back to the committee, let us consider displays and exhibitions.

The main questions here are : where to stage them, the cost (very important to a small club) and how to be fairly certain of a good attendance. Let us take exhibitions first.

Before agreeing to hire the public hall with its attendant high cost, are you certain that you have exhausted all other likely places ? Very often large stores will give up valuable space for an exhibition of models and trophies and I don't mean just window space. We had one instance where the general manager of a large store in the town, upon being approached for such space, promptly proceeded to arrange for a large furniture showroom to be emptied and gave us the run of the place for a week.

The resulting Press publicity gave him his full measure of advertisement and he was well pleased. Total cost—nothing.

A talk with your local cinema manager may prove beneficial to your club's publicity. He will probably have several flying films booked for future showing, and will welcome the co-operation of your club in staging a show in the foyer. No need to worry about attendance here and the cost—again nothing. Our own cinema manager even went to the extent of providing well made card posters which were so designed to be of use at any exhibition, whether connected with the cinema or not.

Then you have the local R.A.F.A. and A.T.C. organisations who will be delighted to have your co-operation in their shows and displays, and who usually have influential people on their committees

who can sometimes overcome obstacles which might possibly prove insurmountable to your club.

The displays organised in conjunction with the above can also prove of inestimable value in dealings with your local council on the oft-vexed question of flying in public spaces. Try to obtain the services of prominent councillors in opening your displays and presenting prizes. This usually promotes a feeling of goodwill between the local government and the model club which is an invaluable asset.

Now I think that the question of flying displays should be given a good deal of thought. First of all, what is the primary object of your display? It is to give the public who attend a good whack of entertainment. The usual round of free-flight, stunt, team racing, etc., soon wears thin and so other ideas must be adopted which will keep the spectators saying: "I wonder what they will get up to next time?"

The biggest novelty that we have had so far was the assistance of a full size gliding club who really gave the crowd something to talk about. The price of their show, which included the whole works, aerobatics as well, was the cost of the petrol required to work the winch.

A popular feature of a C/L show is a "have-a-go" session in which the spectators are invited to try their hands at flying a "goat" model. Such is human nature that the majority of people will laugh themselves sick at other people's antics in the circle (don't we all?) that your "have-a-go" session should be a winner.

We have successfully trained a small girl to pick up streamers with a small control-liner, and, being small she has the sympathy of the crowd with her from the start of her act. Two or three very near misses and then the successful hook up never fails to bring a good round of applause.

Are you bothered with not having the use of a good regular flying field? Why not make yourselves mobile once in a while then? Last year, as an experiment, we arranged a show in conjunction with a tennis club in a neighbouring village. They were stuck for ideas, we wanted to spread the modelling idea around, and the village folk had never before seen a model of any description performing. This was the ideal set-up. Our expenses were guaranteed by the tennis club, and the result was a good day's flying, a substantial amount added to our hosts' club funds (which later resulted in a donation to our funds), and a good number of people asking: "when does the next show come off?" This idea will probably be extended during the coming season.

Well, there you have it. A little imagination, hard work and publicity, and your club is well established. What's that you say? "It's all right for these big clubs to talk, but——" Well, sir, we are 14 members strong and operate in a small Yorkshire market town, but—we do the job—all of us.

Model Talk

(Continued from page 135)

parts again." To those manufacturers who have been gradually switching over to prefabricated kits these last few years, such a statement is apt to prove a trifle disconcerting! However, we have yet to meet the modeller who fails to appreciate cut-out ply and bent-to-shape piano wire parts.

★ ★ ★

In Brief . . .

Many American mail order houses boost their engine sales by giving away umpteen free extras with each order. We received a parcel from a New York dealer recently, which contained a handbook on glow-motors, pulley starter, speed indicator, storage bag, flight log, prop, fuel tubing and what have you. After much searching we finally found the item that interested us most—the *engine*!

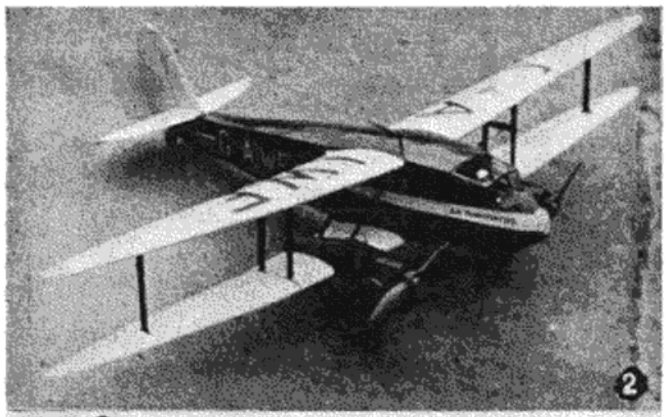
British contributors are frequently represented in the American model mags. nowadays—"M.A.'s" Pete Chinn commenting on "European Trends" in the January "M.A.N." . . . P. E. Norman tells us that he has built a ducted-fan Boulton & Paul P-111 delta. No news of flight results at the time of writing . . . Looking for a scale design for the Jetmaster unit? How about the Swedish *SAAB J-29*, *Grumman Cougar*, *Vought Cutlass*, *Convaire XF-92a* or the *Gloster Javelin*?

Frank Zaic is hard at work collecting model plans for his '53 yearbook. One "capture" he writes about with fervour is an *all-sheet* Wakefield—"A nice friendly model by comparison with the average fragile design of this type" . . . Our good friend Angelo Coccon of Milan is a staunch supporter of British and American F/F design—the latest snap he sent over featuring attractive replicas of the *Flamingo* and *Cumulus*, both with E.D. 2.46s up front.

L.A.C. Royle and his development of the "Contestor" with which he won both the open rubber and Thurston events at the last R.A.F. Championships.

From Wargrave and Wimbledon, Epsom and Exeter, our readers send the pictures that make . . .

PHOTONEWS



RISKING a £2 parking fine, D. F. Eatwell of East Ewell, Surrey, sent us the first picture this month of *Snuffy*, a five-foot cabin pylon job originally designed and flown in 1946 by Cyril Bates of East Dulwich. *Snuffy* was written off as a total loss in the summer of that year, after a rather violent collision with the Epsom grandstand. It was at that time powered by a Majesco "45" petrol engine, but recently it was brought out of retirement, patched up and fitted with a new Frog "250," after which it flew almost straight off for a 10-minute flight after a 30-second motor run!

De Havilland's old faithful, the *Dragon Rapide*, a design not far short of 20 years old, is still giving fine service in many different ways, and countless people have had their first "flip" in this comfortable biplane. It makes an attractive model and in photograph **No. 2** we have a picture of K. Harrison's fine C/L specimen. Finished in maroon and cream, the model spans 4 ft., weighs 3 lb. and is powered by two 1.5 c.c. Allbon Javelins.

No. 3 is a photograph of the popular duration design *Contender* by John Gorham. This model was built and photographed by J. G. Waldron of Wargrave, Berks, and shows the model temporarily in the charge of his brother Ian. Powered by an Elfin 2.49, it placed third in the last Astral Trophy contest with an aggregate of 11 : 39. However, after the installation of a new engine and some two hours of accumulated flight testing, but before another contest—the model came to a sticky end on the Cranfield runway!

Our star model this month is **No. 4**. Interest in scale models of 1914-18 warplanes is very keen just now, particularly among the members of the South London Scale Club. This fine model of the S.E.5.A was built by R. Hutchings in early 1951, and since then has outlived a Frog "100" which has now been replaced with an Elfin 1.8. The model is built to $\frac{1}{8}$ scale which gives it a span of 40 in. The photograph, by the way, was taken with a box camera by J. Savage, chairman of the club. A fine effort, all round!

No. 5 came from R. A. Adams, who always sends us good photographs, and this one is well up to his usual high standard. It shows N. G. Taylor, of the Wimbledon Power Club, getting to work on the motor of his Class " 6 " speed model. Powered by a McCoy " 60," series 20, this model at one time held the British Class " 6 " record at 132.4 m.p.h.

Going from one racer to another, we arrive at **No. 6.** The old Schneider Trophy racers usually make spectacular-looking models, with their rakish lines and huge " boots " and this example is no exception. However, what is unusual is that this one is a flying model—and a rubber-driven one at that ! It was built by P. O'Keeffe of Maidstone to a scale of ½ in. to 1 ft. and is complete with pilot, flying wires, mass-balances on control surfaces and many other details adding up to make a fine model.

Photograph **No. 7** was taken by R. Landymore of Brentwood, Essex, and shows off to advantage his *Piper Super Cruiser*, built from the popular Keil Kraft kit and powered by a Mills .75 c.c.

We frequently receive photographs from J. Genlloud of Lowestoft, who keeps the faces of East Anglian modellers in the picture, and in **No. 8** he has captured a busy scene, as Pete Wyatt of Ipswich gets his Elfin 2.49 really going before a contest flight.

Harry Stil, who draws the cartoons of " Clueless " (and is sometimes known by the more formal title of H. A. Stillings) is not quite so clueless as the character he created, for he has made a good job of the model in our last picture, **No. 9.** It is *Challenger*, another MODEL AIRCRAFT design, by J. A. Newton, which spans 58 in. Harry is secretary of the Exeter M.A.C. and a commercial artist, and has used the posterish colours of red and yellow on his E.D. Comp. Special-powered model.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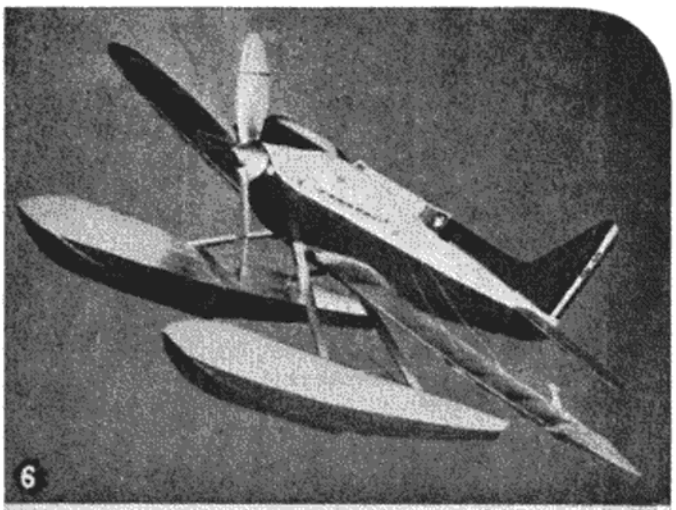
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Letters to the Editor

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

FLIGHT LIMITATION

DEAR SIR,—Your correspondents Horry and Sugden have missed the whole point in their letters (January).

The *sole* reason why there exists a movement to limit duration of all models (this must include Wakefields) is because flying fields are not big enough to cope with the drift of a 4 or 5 min. flight in average weather. Are they the saboteurs referred to in "The Chairman's Warning," page 3, same issue, or the reactionaries referred to in "D/Ts? Ban Them!" on page 2?

All academic arguments about what is "progress," what is the "purpose" of a duratien model, whether "efficiency" would be decreased (would it, with limited rubber?), what "other countries would think" and so on are nothing compared with this necessity to cut our coat according to our cloth. I find the greatest pleasure in a gradual improvement of the power-weight ratio of my Wakefields and have attained the skill required to produce extremely light airframes. But I want somewhere to fly them—even 2 min. is better than no flying!

Incidentally, all rules concerning loading, prop diameter and so on beg the question and will not reduce times appreciably—history tells us that.

Yours faithfully,

Leeds. V. R. DUBERY.

THOSE WARBIRDS AGAIN

DEAR SIR,—I am glad of the opportunity to cross swords with Mr. P. E. Norman, whose aeromodelling skill compels my respect, but whose technique in the design, construction and flying of Great War scale aircraft, arouses my profound disapprobation. To begin with, Mr. Norman, as a student of World War I aviation, knows as well as I do that the aircraft of that period were comparatively flimsy structures of spruce, wire and canvas, driven by relatively low-powered engines, and capable of an average speed of 100-110 m.p.h. To be logical therefore, a flying scale replica would definitely be in the light loading, low-powered, slow-flying class, and this is always the standard I set myself when designing one of these famous warbirds.

My present ¼-scale S.E.5 weighs 1 lb. 14 oz., is fitted with a "Frog" "180" swinging a 9¾ × 4½ Truflex prop. at about 6,000 r.p.m. (hardly screaming, "P.E."!) and flies at about 15 m.p.h. It flies perfectly, is inherently stable, has no vices and is practically crashproof. Many crack south coast club modellers can bear witness to its flying ability. Contrary to Mr. Norman's assumption, however, it is not a "light structure covered with tissue," but a substantial, practical, true scale performance model aircraft.

Mr. Norman's approach to the design of a 1914-18 scale model is diametrically opposite. He selects as a prototype one of these lightly-loaded 100 h.p., 100 m.p.h. aeroplanes, designs a ⅛th scale replica, builds an unnecessarily heavy and rugged airframe, installs the aeromodelling equivalent of a Rolls-Royce "Merlin," flies at a relative scale speed of about 250 m.p.h. and regards it as a true scale model of a World War I fighter. "P.E." tacitly admits that his models fly at about 30 m.p.h., by his insistance on their ability to fly in high winds. I ask, therefore, which of these two schools of thought produces World War I scale model aircraft most closely approximating to their full-size prototypes?

I would, however, like to end on a conciliatory note. Messrs. Savage, Norman and myself are on a common footing in our adherence to the flying scale model as true aeromodelling, as opposed to those grotesque aerial horrors, "pylon models," and as far as I am concerned, I have no desire to indulge the flying freak fraternity with the spectacle of scale enthusiasts engaging in a literary "dogfight."

Yours faithfully,

Portslade, Sussex. A. W. GARRY.

SELECTION OPINION

DEAR SIR,—I hope you will permit me to make a few remarks about your December issue article "The Case for Team Selection."

Your argument appears to be based on a fallacy. The international contests are individual events in which the best man at the time wins whatever his nationality. Great Britain or the U.S.A. or Finland have never won the Wakefield contest; Chesterton, Korda and Ellila have. If the events were team competitions between nations the aggregate or average of each team would count in the scoring, but as everyone knows, it does not. The events are held to determine the best individual in each class by a series of eliminators of which the international contest is the last. On these grounds alone, the suggestion that some individuals should be allowed to ride over the preliminary rounds is grotesque.

In Britain the expenses incurred by sending teams abroad or by holding international contests here are met by the S.M.A.E., which is another way of saying that they are met by the membership at large, from whom the S.M.A.E. derives its income. The numbers of entries in the eliminators is proof enough that large numbers of members are dead keen on winning a place in one or other of the teams. Most of them are doomed to failure but the chance is there, and since the membership pays for the whole show, it should remain there.

There are not in any case any very good reasons why team selection is likely to bring success for British fliers. Since the war, of the British Wakefield team members, only three have placed in the first three of a Wakefield contest. Evans might have been pre-selected, although he was not as well known in 1950 as he is now; but Chesterton and Henry Tubbs would surely not have been selected on form. The Wakefield has in fact been won time and again by modellers who were relatively unknown before they won.

It is a bit early to say with A2 and Power, but even there neither Silvio nor Wheeler who between them beat the world in power last year is likely to have been selected on form.

Finally, for goodness sake let us climb down off our high horses and stop taking ourselves so seriously. Aeromodelling is just a hobby—the best there is, perhaps—but still a hobby, and all this talk of international prestige (whatever that means) is just bafflegab. Neither official-

dom nor the general public is interested in aeromodelling in any country in the world this side of the Iron Curtain, and the only thing that matters is whether our teams behave themselves abroad and what impression they give, as individuals, to the foreign individuals they meet. There have not been any grounds for complaint so far.

Yours faithfully,

Leeds. K. RUTTER.

P.S. Bafflegab = fiddle-me-ree and farrago.

DEAR SIR,—I read with interest your article in the December issue of MODEL AIRCRAFT and found myself in agreement with you in the opinion that an international team should be selected in part and eliminated in part.

I was therefore in violent disagreement with the rather one-sided attitude taken by your correspondent, Mr. O'Neill, in the February issue of the journal. I take him to suggest that it is not even the object of the teams to win the trophies. Ask any Wakefield man, Mr. O'Neill. He does not go to all that trouble for a day's sport flying in a foreign country. And ask the people who contribute to the Wakefield fund. They do not do so with the hope of losing! After all, what is competition for if not to pit one's skill against the next man's?

Yours faithfully,

Sutton, Surrey. A. G. OVERFIELD-COLLINS.

Engine Tests

(Continued from page 115)

bearing, with a tell-tale loss of fuel on to the back of the prop blades, but this was no more serious than is commonly encountered and would have little or no effect on performance or on the life of the unit. Like so many small modern and medium sized diesels, the crankshaft of the Typhoon is of the plain unbalanced disc web type but vibration is not excessive.

The manufacturer's recommended prop sizes are evidently calculated to allow the Typhoon to approach fairly closely to its peak r.p.m. For free-flight, 9½ in. × 4 in., or 9 in. × 4 in., airscrews are specified and 8 in. × 8 in. or 8 in. × 7 in. props are recommended for control-line work. For free-flight work where utmost performance is not the primary consideration, however, a somewhat larger size, such as a 10 in. × 5 in. can be used for more economical operation.

Power/weight ratio (as tested): .946 b.h.p./lb.

Power/displacement ratio: 93 b.h.p./litre.

Matching Engine and Prop

(continued from page 131)

and the new pitch is 12 in., then we have 3 times the pitch, and must divide by $4\sqrt{3}$ for the new diameter, or by 1.315, so the new diameter will be about 6.65 in. You should try 6¾ in., as the nearest "even" size.

Now don't imagine that if you fit such a size on the bench, you will get the same revs. as before with the free-flight prop. You will not It is only when running in air meeting the propeller at 80 m.p.h. that the revs. come near the right figure. If you happen to have a car with an open roof and run it into a wind of 40 m.p.h., then when the car is also doing 40 an engine held in the airstream would allow of a test being made, but it is not recommended, as the air close to the car roof is usually moving at some extra speed due to the disturbance from the windscreen. Besides, traffic police take a dim view of the idea.

For C/L stunters, you want top power at some speed which corresponds to the speed after a rather "mushy" pull out from a loop. This is the moment when you need all the thrust you can get, and it is quite a low speed condition, so that you may well try designing your propeller for speeds of about 35 m.p.h., or you may simply take 50 per cent. more pitch than free-flight. In fact if you use flexible plastic propellers, which tend to increase pitch at high speeds, the nominal pitch might be almost the same as free-flight values. It is a mistake to design the stunt propeller for the top speed of the model, and with very fast running engines such as some of the 5 c.c. glo-plug types, fitted to large stunters, the best pitch is very fine.

It is very interesting to notice the difference in the rate of running for various engines, which gives top power. For example an E.D. Comp. 2 c.c. gave its best thrust, 24 oz., when turning a 10½ in. × 4½ in. prop with blades 13/16 in. wide, at 7,850 r.p.m., while a newer type of engine, slightly smaller, gave 21½ oz. at 9,000 with an 8¾ in. × 4 in. × ¾ in. version. The odd thing is that if you swapped props, the new engine could not turn the 10½ in. much above 5,500, which showed that it had to be running fast to be efficient, while on the other hand the Comp. could not turn the smaller prop much above 8,250. So that there was quite an argument over the merits of these two power units, with the owners each able to point to advantages for his one, for particular jobs.

By the way you can have quite a bit of fun with two units on test bogies, on a tug of war basis, and it settles arguments about engine thrusts in no uncertain manner. Very popular with juniors, but see that all these fuselages stored under benches are put away first, as when one engine stops, the whole outfit is liable to run amok. But even with one unit, you can compare fuels and propeller types, check flexible propellers against wooden ones, check home carved ones against a professional standard, and generally give yourself a bit of insight into what makes the model fly. It is a fact that half the power models brought to free-flight events have no chance at all, through being fitted with the wrong propellers, so if you want to beat half the competitors right away, do some testing. You don't need to bother working out horsepowers or anything, just weigh the thrust and keep notes, including fuel, engine (actual number if there are a lot the same), propeller, thrust, etc. Graphs are the simplest way of showing results.

The drawing for our standard test propeller given, will show you how to carve one for yourself. Take care to balance it, both when full size and after every trim down, and see that the blades are of good section. All you need after that is a few cans of fuel, and a gasmask or so.

But don't just read this article. Do some tests of your own. It is good fun, and worth while.

Northern Notes

A member of Sheffield Club launches the latest A2 design of club-mate B. Ridal. Finished in black and white, this machine is a very consistent performer, turning in flights of 3 min. plus regularly

★ NO DOUBT about it, boys and girls, the coming season looks like being the best to date. In case you haven't yet heard, the Wakefield itself—yes, the Final of all Finals—is to be held at Cranfield over the August Bank Holiday, together with the World Power Championships, at present held by our own Northern Weltmeister, Silvio. Now it doesn't need half an eye, or the intellect of a model magazine editor to realise that this is going to give us one of the best chances we have ever had of regaining possession of the "Old Pot"; in fact, with just the teeniest bit of luck we should have the best International year ever. Every summer's day has its little cloud, however, and it is no secret that the fitting in of these important events has caused your Council no little consternation, in fact, the whole comp. programme for the year has had to be revised. For one thing, poor old Capt. Taylor has had to find a new date for the Nats., and by some means or another he has to fit in some C/L eliminators very early in the year, in order to find a team to attend the International events to be held about the end of April. Again, the vociferous demand that the three finals be extended to one hundred finalists in each event means that these cannot be held on the same day, hence further complications are added to the already crowded programme. At the moment it seems fairly definite that the Wakefield and Power Finals will be held together, probably at Cranfield; it also seems definite that both events will be a normal daytime job, i.e. no late at night or early morning flights. Much consternation and gnashing of teeth from the still air builders!! What a chance for the local lads, though; for the Finals to be flown under the same conditions as the competition proper. The only news available in respect of the A/2 event is that it will be flown off 50-metre lines at the same venue in Yugo-Slavia, August 21st to 23rd being the date, and note carefully you nylon users, the maximum permissible stretch will be 15 per cent. of the line length. How this will be determined no one knows, but probably some 16-stone thug will hang on to the end of your line until it either stretches beyond the limit or busts.

★ THE NEW high-priced affiliation fee doesn't seem to have caused much comment, at least not in my hearing, but one or two people seem to think that something should definitely be done to ensure that everybody pays up. As everyone knows, there are lots of bods who will join up with the local club at the beginning of the flying season only to fade quietly away well before the end, and it is very doubtful if the society ever sees anything from these jokers. After all, one has only to look at a club who affiliates in, say, December. At that time its membership is probably about at its lowest ebb and about half what it would be during the season. Hence it only pays about half the affiliation fees it ought, and it should be noted the club is nowhere at fault, since affiliation is only payable upon the membership at the date of affiliation. To get round this, it is suggested that all affiliation fees fall due at the same time, if possible just before the beginning of the comp. season. Clubs would declare so many members, paying the appropriate fee, and receiving in return an equivalent number of affiliation cards, which in turn would be filled in by the club sec. and issued to the members. At the end of each month, clubs would declare any freshly joined fliers, paying a proportionate amount of the annual fee for these, again receiving an affiliation card for each, said cards lasting until the end of the affiliation year. It is felt by these means, everyone would pay their proper whack, and, of course, it would be pretty easy to check upon the comp. fliers at least. I may add that this scheme, or similar variations, have been suggested by clear-thinking and responsible members of the society, so doubtless it will be well considered by your Council.

★ TALKING THE other day to one who has much to do with all the clubs in the country I was informed that there is very often a considerable difference between lists of Area clubs published by the Area Committees, and the actual number of active clubs within that Area. Now, in effect, this means that quite a few clubs are being left out in the cold; in fact, I am informed that there are no less than fourteen clubs in the Northern Area alone of which the Area Committee knows nothing. If you are one of these clubs, I would suggest that you drop a P.C. to the Area Secretary right away and get into the swim; it will cost you nothing, and it will be much better than fiddling about on your own. If you don't know the whereabouts of your Area Sec. write to the Society; after all, service is what you pay for. In passing, it is not so well known that unaffiliated clubs may participate in the delights of Area membership for a time, just to see if they like it.

★ A FINAL note with reference to the eliminators. Since there is to be only one this year it raises the problem of the Area who may be rained or stormed out on the vital day, and the Council in their wisdom, mercy and what have you have decided that in such a case, where the conditions are absolutely against flying (i.e. winds of 70 knots, 2 in. rain and visibility zero) any Area affected may postpone the eliminators for one week only. Any such postponements shall be for the purposes of elimination only and times will not be recorded for the appropriate S.M.A.E. event. Clear? No? Pity. Just going back to the note about 1954 Wakefield rules for a moment; remember there will be an eliminator for this event in September this year.

Back to School

with Ivor F. Stowe

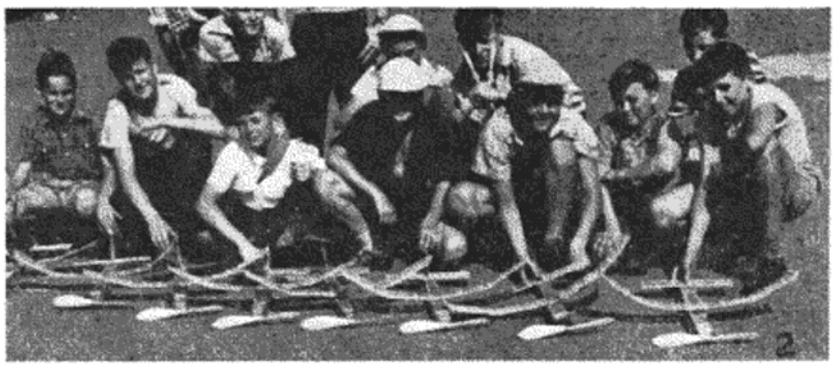
An Australian schoolmaster tells the story of his scheme to introduce modelling into school—with success and not a little amusement!

1. *Barry Spencer lets go one of the "baby" Wakefields"—a simple reliable design.*

IN the June issue of MODEL AIRCRAFT last year, there appeared an article on "Half-Scale Wakefields," as a follow-up to "Half-Scale A-2s." This article gave me just the information I needed on a design suitable for a school project.

Out here in Australia the annual school examinations usually end a month or so before the summer (Christmas) vacation, and it is this month, free from swotting and other exam or syllabus worries, which can be used for a wide variety of activities.

Fortunately the school where I teach has a very progressive and co-operative headmaster and he was completely in favour of a model aero project for a limited class.

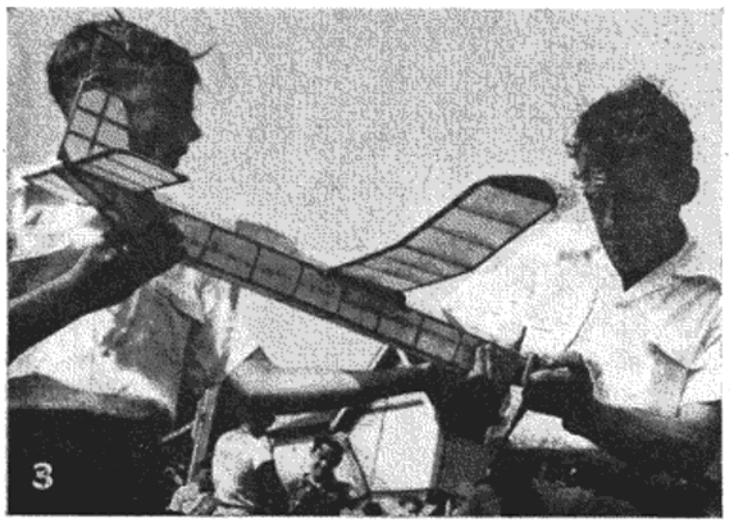


2. *A line-up of some of the fleet of models, with the builders. Variations in dihedral (including the interesting elliptical specimen on the right) are due to lack of storage—while-drying space—and the inability of some boys to distinguish between 2¾ in. and 3¾ in.!*

As can be imagined, there were far more boys applying for the class than the twenty-five I intended to take. However, the "no-hopers" were weeded out simply by asking for volunteers for a class to be run after school. Actually, of course the class was run in school time, but this little stratagem ensured the keenness so necessary, the not-so-keen types vanishing like an o.o.s. at the mere thought of an hour extra at school.

Eventually a class of twenty-seven was left, and this was split into groups of three, nine models in all being built. The age range was from eleven to thirteen and most of the boys had built a chuck glider, but some had never handled balsa and cement before and none had handled tissue, props, or rubber. Much credit goes to the enthusiasm and patience of the boys, for without these two vital ingredients the teacher would have got nowhere.

3. *If the motor breaks now, the author's prestige is ruined! If he had stopped at 500 he would not look so anxious!*



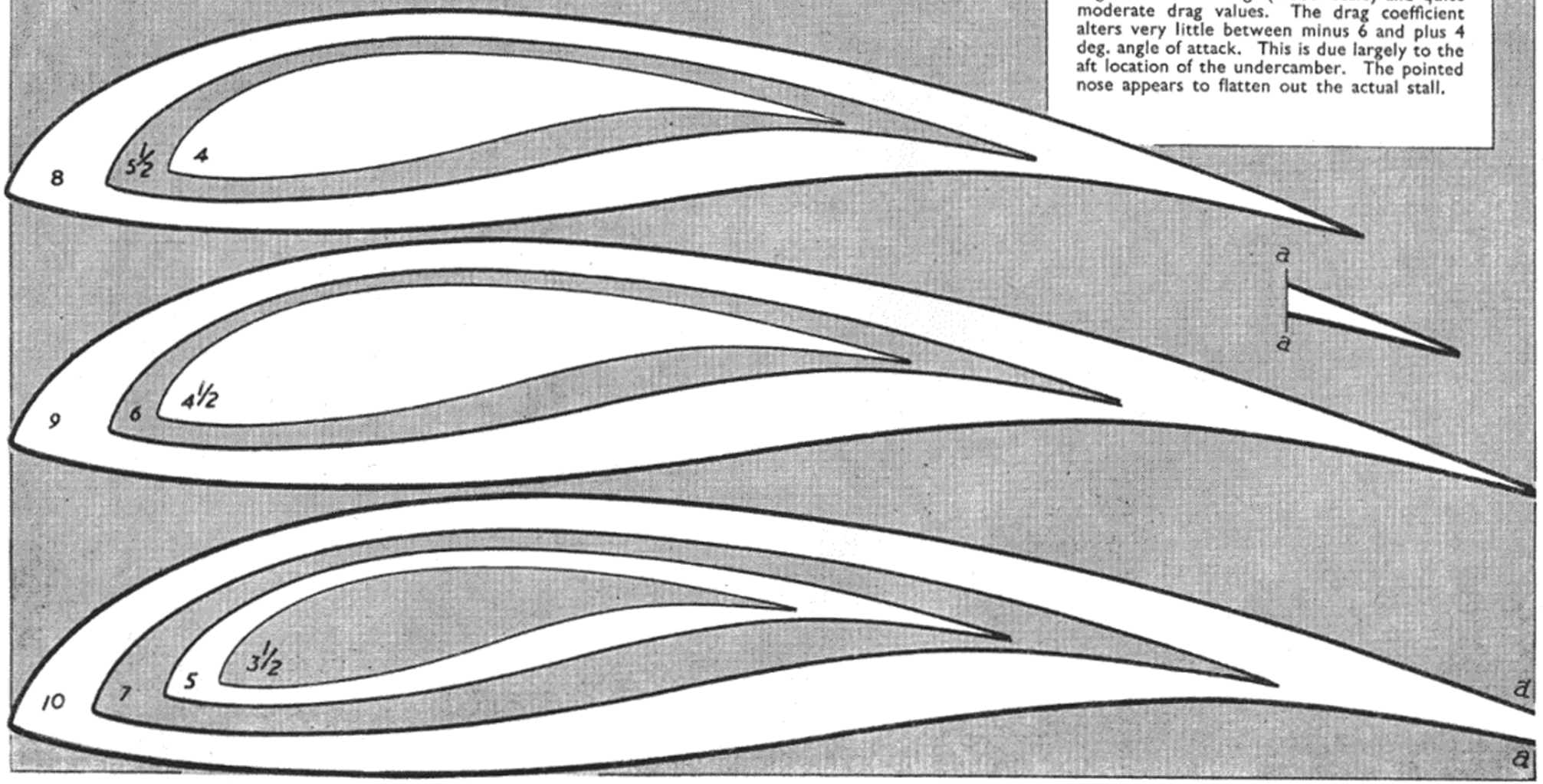
The models cost more to build than the estimated cost, but this was largely due to the waste that is always incurred by inexperienced modellers. One group built three tail-planes before achieving one free from warps! As well, materials cost more out here. A 13 in. propeller blank costs 2s. 4d., rubber 8d. per yard and steel wire 1s. 9d. per length. The models each cost about 15s. (Australian) to build, and were sold to the boys for 15s. The club joining fee was five shillings per head and the money left over has been used to purchase three English motors for the coming year.

As can be seen from the photographs, the layout adopted closely followed that suggested in the MODEL AIRCRAFT article. Fuselage is 1½ in. × 1½ in. × 26 in. Wing is 26 in. × 4 in., tail 35 per cent. It was found that eight strands of ¼ flat were needed to turn the 13 in. prop. A 36 in. motor would take 600 turns but 500 gave much longer life. The added weight and trouble of an undercart was considered not to be worth while. One minute consistent may not sound a very good performance but I can assure readers that some of the construction was such that I was more than pleased to find that all nine models were capable of staying in the air—remember your own first attempt?

STATION	0	2·5	5	10	20	30	40	50	60	70	80	90	100
UPPER	5·7	10·4	12·4	15·2	18·4	19·5	19·4	18·2	16·2	13·5	10·8	7·3	3·5
LOWER	5·7	4·7	4·1	3·6	3·2	3·4	4·5	5·9	7·4	8·1	7·5	5·8	3·2

242-G

This bird-like wing section has given excellent results on model gliders. It is a thick section with a very generous undercamber—almost a flapped trailing edge, in fact. Another distinguishing feature is the pointed leading edge. The 242-G develops high lift with a stalling angle of about 9 deg. (model scale) and quite moderate drag values. The drag coefficient alters very little between minus 6 and plus 4 deg. angle of attack. This is due largely to the aft location of the undercamber. The pointed nose appears to flatten out the actual stall.



From the S.M.A.E. and the CLUBS

REPORT OF S.M.A.E. COUNCIL MEETING HELD AT THE HORSE SHOE HOTEL, TOTTENHAM COURT ROAD, W.1, ON SUNDAY, JANUARY 11th, 1953, AT 11 a.m.

The following were present :—A. F. Houlberg (chairman), R. F. L. Gosling (N. Eastern), D. A. Gordon, Captain S. D. Taylor, H. W. Barker, C. S. Rushbrooke, K. J. A. Brookes, E. F. H. Cosh (London), B. A. Messom (Northern), D. Salloway (N. Western), R. W. Yates (Southern), J. M. Taylor (W. Scotland), J. S. Bishop (Western), R. Landymore (E. Anglian), P. C. Doughty (Midland), N. F. Couling (S. Eastern), F. A. Dismore (Royal Aero Club).

Kemsley Trust Loan

The chairman read the amendment to the agreement between the society and the Kemsley Trust relating to the proposed loan of £300. The amended agreement was considered by the Council to be satisfactory and the chairman was authorised to complete the negotiations.

1952 *Annual Dinner and Dance*

The chairman read letters which he had received from the society's guests at this function, expressing their appreciation of what they considered was an excellent evening. The Organising Committee were given a hearty vote of thanks for their work.

Area Finance

Mr. H. W. Barker informed the Council that in collaboration with Mr. G. Russell Fry, of Messrs. Andrew Bar & Co., the society's auditors, he had given further consideration to whether area funds should be included in the society's annual balance sheet. Mr. Russell Fry, who was present at the meeting, stated that the society's constitution was rather vague on this subject.

The matter was discussed at some length and it was decided to obtain the opinion of the society's solicitors concerning the advisability of modifying the Articles of Association. It was pointed out that the investigation was not being made with a view to incorporating area finances in the General Funds but in order to clarify the position.

Correspondence

The secretary stated that a letter from the F.A.I. advocating an international reciprocal arrangement to facilitate the easy passage of models for international contests had been referred to us by the Royal Aero Club. The R.Ae.C. had been requested to give this suggestion their full support.

Mr. Dismore said that discussions with H.M. Customs and Excise had already commenced.

A letter from the R.Ae.C. was read in which reference was made to recent comments in MODEL AIRCRAFT concerning the possibility of the Royal Aero Club contributing to a common fund for international contest organisation. Mr. E. F. H. Cosh stated that he considered that the reference in question was fair comment. It was agreed that the society request the Royal Aero Club to launch an appeal to secure funds for organising the 1953 international contests to be run in this country.

Area Resolutions

Resolutions from London Area Committee.

1. "THAT decentralised contests be continued."

The competition secretary stated that these would be included on the questionnaire which would be circulated in connection with the 1954 contest programme.

2. "THAT the Council submit to the F.A.I. a proposal that for international free-flight contests, method of launch should be optional."

To be submitted for consideration at the next F.A.I. meeting.

3. "THAT the Council submit to the F.A.I. a proposal that for international free-flight power contests the motor run be 10 seconds."
4. "THAT the Council consider altering the Wakefield specification in order to reduce average times."

The Council considered that items 3 and 4 above were covered in the report of the last F.A.I meeting.

Resolution from the East Anglian Area Committee.

"In view of the fact that there will only be one eliminator for the Wakefield and A-2 1953 contests, there should be 100 contestants in the Trials and not 50 as proposed."

The above resolution was carried and it was decided to spread the Trials over two days as follows :—

(a) Wakefield and International Power Trials.
(b) A-2 Glider Trials.

The London Area delegate again drew the Council's attention to the fact that the position regarding the allocation of S.M.A.E. competitors' badges to winners of C/L speed events had still not been decided.

The records officer stated that he had received a request from the London Area secretary for badges in respect of the 1952 contest. The Council decided that certificates only would be awarded for these contests.

Finance

The treasurer presented his Statement of Accounts which after a short discussion were passed.

Mr. Barker stated that he proposed to allow Area Committees to obtain goods against amounts due to them for affiliation fees. Statements would shortly be circulated to areas, showing the amounts owing to each area.

F.A.I. Meeting Report

The society's representative on the F.A.I. Model Commission gave a report of the proceedings at the last meeting which was held in Paris in December, 1952.

The next F.A.I. meeting will be held in Monaco in May, 1953.

Mr. A. F. Houlberg was accorded a vote of thanks for attending the meeting and for his report.

British Nationals

Captain Taylor stated that the holding of the world championship events in Britain during the August Bank Holiday weekend would make it necessary to bring the British Nationals forward to Whitsun weekend. No venue in the London Area had so far been found for this meeting but the chairman undertook to make further enquiries.

International Contests

The Council agreed that the society in 1953 shall, subject to the necessary funds being available, enter teams in all of the world championship contests.

A short discussion ensued on the arrangements for the Wakefield and International Power Championships and the following Organising Committee was appointed :—Captain S. D. Taylor, E. F. H. Cosh, F. A. Dismore and C. S. Rushbrooke.

Area Eliminators

The Council agreed that in the event of the weather being entirely unsuitable on the date fixed for the Wakefield, A-2 and Power eliminators, Area officials could defer the trials for one week. The results would, however, only apply to the eliminators.

1953 *Contest Programme*

Captain Taylor stated that the late notification of the F.A.I. calendar would necessitate a considerable number of alterations to the S.M.A.E. contest programme. He would, however, endeavour to circulate the programme as soon as possible.

MODEL AIRCRAFT *Subscriptions*

Copies of MODEL AIRCRAFT will again be available to areas for prizes as last year. Area Committees are to be informed in the near future of the number of subscriptions allocated to them and are to be requested to forward their lists without delay.

At the Crewe M.F.C.'s exhibition recently was seen this one-eighth scale "Dragon Rapide" by D. Morrey. Powered by two Mills 1.3's it has come safety through its trial flights. In front is a Frog "50" powered "Fidgety Midget," built from "M.A." plans by C. Hollowood

Records

The following record was ratified :—L/Wt. Canard Glider—T.L., G. F. J. Caple (R.A.F. M.A.A.) 22 :11, 7/9/52.

The following new record claims were accepted :—Indoor Helicopter-ROG, R. T. Parham (Worcester) 2 : 31, 14/11/52 ; Indoor Helicopter-ROG, P. W. Read (Sth. Birmingham) 4 : 04, 19/12/52.

Merit Certificates

These were awarded to the following :—Class B. No. 421 R. Cole (Epsom), 459 Harrison, I. G. (Cheadle), 798 Lamb, W. (York). Class A. No. 861 Bagnall, A. F. (Whitefield), 862 Pollard, R. C. (Tynemouth), 863 Eales, W. F. (Rugby), 864 Weller, A. J. F. (Bournemouth).

Applications for Affiliation

The following applications for affiliation were accepted :—Sidcup Aeronautical Society, S.7 J.3, Handley Page M.A.C. S.20 J.2.

Applications for Re-affiliation

Applications for re-affiliation from the following clubs were accepted :—Northern Heights M.F.C. (L) S.44 J.6, Glasgow Barnstormers M.F.C. (W. Sc.) S.14, Hastings and District Aeromodellers (SE) S.12 J.2, Slough M.A.C. (S. Mid.) S.12, J.12, Monifieth Monarchs M.A.C. (N.E. Sc.) S.5 J.3, Boston and District Aeromodellers (E. Mid.) S.10 J.5, Folkestone & D.M.A.C. (SE) S.12 J6, Coventry & D.M.A.C. (Mid.) S.35 J.5, Dudley Demons (Mid.) S.7 J.9, Torquay M.A.C. (SW) S.20 J.7, Crystal Palace M.A.C. (L) S.13 J.6, West Middlesex M.F.C. (L) S.17 J.2, Polish Air Force Assoc. M.A.C. (L) S.19 J.18, North Wirral M.A.C. (N.W.) S.7 J.6, Streatham District Aero (L) S.16 J.2, Hinckley and District M.A.C. (Mid.) S.12, J.10, South London Scale M.F.C. (L) S.5, Southampton M.A.C. (S) S.35, J.17, Harrow M.A.C. (L) S.8 J.2, Ilford & D.M.A.C. (L) S.15 J.11, Blackheath and Halesowen M.A.C. (Mid.) S.7 J.1, Hayes and Dis. M.A.C. (L) S.12 J.3, Lewisham Orbit M.A.C. (L) S.8, Belfairs M.A.C. (E.A.) S.15 J.10, N.W. Middlesex M.F.C. (L) S.11 J.5, Blackheath M.F.C. S.16 J.14.

Annual General Meeting and Annual Dinner and Dance

The Council's previous decision to hold the annual dinner at a venue out of London was discussed and it was decided to revoke this and to hold the 1953 dinner and prize-giving at the same venue as the previous two years. The Council also decided to hold the annual general meeting at a venue outside London and Mr. P. C. Doughty offered to make enquiries concerning the possibility of holding it in Birmingham.

Sub-committees

The following sub-committees were appointed :—

Contest Rules. Messrs, Hundleby, Cosh and Brookes.

International Travel. Captain Taylor and Mr. Hundleby.

Social. Messrs. Coote, Cosh and Gordon.

Control-line. Messrs. West, Muscutt and McNess.

Radio Control. Messrs. Coote, Honnest-Redlich and Sutherland.

Indoor Nationals

Mr. Doughty undertook to endeavour to arrange for the Midland Area Committee to hold this meeting in Birmingham.

The meeting terminated with a vote of thanks to the Chair at 4.45 p.m.

LONDON AREA

The A.G.M. of the London Area was held at the Horseshoe Hotel, Tottenham Court Road on January 12th.

The retiring officers presented their reports on the year's work and each was accorded a hearty vote of thanks. The area has been particularly fortunate this year in having such excellent officials and it was regrettable that they were not all standing for re-election for the coming year. Malcolm Young has been a most hard-working and competent secretary and has received splendid support from his fellow officers. Our best wishes go to Mr. Martin, his successor in this most important job and to the new competition secretary Mr. White. The other officers for 1953 are : chairman, Mr. C. Brett ; treasurer, Mr. J. A. MacDonald ; S.M.A.E. Council delegate, Mr. E. F. H. Cosh ; P.R.O. Mr. J. B. Knight.

The meeting closed with the presentation of the area's trophies, 1952 winners being as follows : L.D.I.C.C.C., Hayes ; T.M.A.C., Croydon ; Keil Trophy, Croydon ; Junior Trophy, D. Rumley (Kentish Nomads).

L.A. Secretary : R. P. MARTIN, 40, Princes Gate, Kensington, S.W.7. (Phone : KEN 6984 and 9-5.30 TRA 7711, ext. 7279.)

L.A. Competition Secretary : P. H. WHITE, 10, Holders Hill Crescent, Hendon, N.W.4. (Phone : HENDON 8882 and 9-530 TIDEWAY 2401.)

EAST ANGLIAN AREA

The East Anglian Area members braved the snow on Sunday, January 4th, holding the first meeting of the year, an open duration contest for the Joan R. Hooper Trophy, at Ipswich.

The winner was J. Gorham, who made three very good flights with the geared Wakefield he flew at last year's trials. Once again, Nordic team member, M. A. King, was beaten into third place by his fiancee, Miss P. Healy, who flew his latest lightweight glider design. The leader in power was N. Willis, of the Central Essex Club.

Results :—

1. J. Gorham (Ipswich), (Wakefield) 9 min. 53 sec. (Max. 10 min. 30 sec.).
2. Miss P. Healy (Belfairs), (glider) 8 min. 13 sec.
3. M. A. King (Belfairs), (glider) 8 min. 3 sec.
4. N. Willis (Central Essex), (power) 7 min. 51 sec.

BLACKPOOL & FYLDE M.A.S.

Although no club competitions, are being held at the moment, much trimming is being done by various members of the club. The majority of models at the moment seem to be power models ; T. W. Smith is now turning in ratios of 30 : 1 and over on 10 sec. engine run with his latest power job which is called *Buttered Bun* (believe it or not), and other models have been doing very creditably, although with more modest ratios. Mike Thomas now claims to do over 3 min. easily with his massive 54 in., 8 oz. lightweight rubber model which is built to the proposed new 50 per cent. air-frame weight rules. F. Marsden has brought out two 1.49 c.c. lightweights using geodetic wings and tailplane, and reports that this construction is absolutely satisfactory and neither of the models had a warp anywhere. The club has now a room for regular meetings in the club-house of the Blackpool and Fylde Gliding Club, who have very generously loaned the room and to whom many thanks are due. Meetings will be held on Monday nights and anyone who is interested may attend.

AEROBODS OF NOTE

No. 12

HENRY TUBBS

A Wakefield "gen-man." Second place in 1951 Wakefield Contest. Designer of a Wakefield masterpiece, *The Red Swan*

ST. ALBANS M.A.C.

The first annual All Britain Model Aircraft Rally will take place at Radlett Aerodrome, Hertfordshire, on Sunday, August 23rd, 1953.

The All Britain Rally incorporates the eighth All Herts Model Aircraft Rally and includes all the well-known features of the latter. The change in name has been made to indicate more clearly the scope and popularity of the meeting and, particularly, to avoid confusion in the minds of the public, such as has often arisen in the past.

In addition, an international aspect will be lent to the rally in 1953 by the inclusion of the International Jetex Contest for the Nobel Trophy, presented by I.C.I. Ltd. This competition will be organised by Wilmot, Mansour & Co. Ltd., and further details and entry forms will be available shortly.

The organisers fully appreciate the sentimental value attached to the former name, but would point out that greater public appreciation enables better service to be given to aeromodellers attending. The change in title has already wrought considerable benefits, some of which should be evident next year.

CHEADLE AND D.M.A.S.

Winter season in the Cheadle and D.M.A.S. got rolling nicely with a rather original scramble comp. on Boxing Day. 1½ hours were allowed, 2 min. maximums, and a 5 min. bonus "for a tree." Quite chaotic in a small field surrounded by trees ! The winner—eventually—was C. Gardiner with 22 min. 17 sec. (including three trees) in an inspired effort. Only one disqualification took place—Garth Evans claiming 10 minutes' bonus for two treed chuck gliders, at zero range . . . he and his new rules . . !

1953 prospects seem excellent here, with a fair-sized battery of 4 min. plus Nordics in evidence. Junior member B. Mackintosh's *Quickie* continues to do 4 min. plus any day—including contests, strangely enough !—and with B. Faulkner's *Ancient Briton* and Evans's new high A.R. effort doing between 3 min. 50 sec. and 4 min. 30 sec. consistently, with the odd 5 min 15 sec. "still air" (!) flight just to muck things up.

Big stuff on the way is Walt Nield's Mk. II *Star Buzzard*—built lighter than the Mk. I, and probably easier to tow on days like Sherburn, when Walt missed his youth horribly ! A 9-footer of undisclosed layout by Charlie Gardiner is another hope, to replace the cocooned *Conquest*. Pause for reflection.

It appears that line lengths are on the creep lengthwards again ; it would appear that, after last year's multiplicity of multi maximums, the average modbod at the scoreboard is put off by winning averages around the 2 minute mark ! Line length is scheduled at 200 ft. for future contests, the controversial rubber/airframe figure rule of 1/2 being retained. 10 sec. power run remains unchanged.

On the strength of the first new rule meet, where almost all the top ten gliders were at

least 9 ft. span, we should have a moral somewhere. Those Nordics . . . digits crossed !

HALIFAX M.A.C.

Since the annual general meeting the members have had a demonstration of prop carving by Kenneth Grant, a talk on Nordic gliders by John Magson and a review of power duration jobs by Eric North. Several members are now building Wheeler's *Eliminator* champion power design.

Members were out flying all Boxing Day, the weather being perfectly calm though very damp. Mrs. Mavis North had a new Nordic glider out for the first time and produced a nice 3½ min. flight.

A promising junior—Geoffrey Wright—put in some very consistent flying with his Elfin 1.49 *Mallard*. Eric North averaged 4 min. 10 sec. with his 1952 calm weather A/2, best flight being 5 min. 20 sec.

On December 28th, 1952, the club held a contest for the Chamber's Trophy which had to be abandoned after the first round due to a really dense fog which suddenly descended. Maurice Childs was flying a brand new *Li'l Aud* which had a really high climb and quickly went o.o.s. ; he then had to wait until the d/t brought it back into sight again.

HOUNSLOW M.F.C.

The club's membership has gone into a steady decline, there being now only a bare dozen left and the financial position is looking bleak ; however, with a proper clubroom now at our disposal we are hoping to carry on.

A very welcome new member is Roland Carlson, an *ex*-clubmate of Sune Stark ; maybe he will provide an extra boost to activities.

The winter activities have so far been confined to hydroplanes and a R/C boat—which performs unprecedented manoeuvres—so far without any radio installed. However, cement has again been noticed on several members' fingers, and at least one Wakefield and several gliders of various sizes are being built.

New members are welcome at the clubroom (fortnightly on Tuesdays) at the R.A.F.A., 71, Grove Road, Hounslow.

BRADFORD M.A.C.

The Bradford M.A.C. have decided to adopt an additional type of competition for the interest of members during the 1953 season which, it is hoped will create a great deal of fun and also help to swell the club funds, as it is proposed to charge one shilling as an entry fee !

The contest will take the form of a " knock out," and the names of intending competitors are to be drawn at random. Each pair will then make four flights, the highest aggregate to determine the winner in the usual manner. Any type of free-flight model may be used, and as there will be no discrimination between the less-skilled and the expert flier, there will be an inducement for the former to improve his standard of flying. The ultimate winner at the end of the season will receive one of our trophies, at present redundant, and if nothing else, these competitions should enable an interesting comparison to be made of the relative performances of power models against Wakefields and gliders under similar conditions !

Our membership seems to have dropped considerably just lately. What about it, you local chaps ? You are assured of a cordial welcome, and all you have to do is get in touch with our secretary, MR. J. T. LONDON, at 220, Savile Park Road, Halifax.

HENLEY MODEL CLUB

The H.M.C. power/ratio contest took place on January 4th and was won by D. C. (C/L) Painter with a three flight aggregate ratio of 17.48 to 1, J. Sargent placing second with a 16.3 to 1 total ratio. The contest was held in cold windy conditions and several entrants pranged whilst trimming before the contest. Painter flew a Frog " 150 " powered *Li'l Aud* and Sargent flew a Mills 1.3 c.c. powered *Snorky*, the model being built over two years ago and having been in store whilst the owner did his National Service in Egypt.

Several members are building feverishly for the contest season, J. Waldron having three modified *Contenders* ready, with a 10 ft. F.A.I. glider, three A.2's and a Wakefield all finished and ready for trimming. D. C. Painter has two A.2's and a power model under construction, with an F.A.I. power model and 6 ft. glider all ready and trimmed and A. W. M. Cooke has four Wakefields finished, two A.2's and one more under way, a 6 ft. glider and an F.A.I. power model finished, with another on the board.

CAMBRIDGE M.A.C.

As a result of a great deal of local publicity the Cambridge M.A.C. is now firmly established as one of the leading local associations in Cambridge. The club's good friend Alderman A. C. Taylor is largely responsible for this. He has given the club a great deal of space in the local newspaper, the *Cambridge Daily News*, and now the club has a weekly " write-up."

During the '52 season members did quite well in contests. Cecil Salter won the " Nationals " R/C event, and placed second in the " Ripmax." Jetex expert Derek Lipscombe also did quite well in the contest world.

At the moment the club seems to be engrossed with R.T.P. models. Very popular models are the " K.K." and " Skyleada " range of 3/8 Jetex kits. These make very good R.T.P. fliers. The most popular models in the series, seem to be the *Attacker* and the *Avro* 707*A*.

SUNDERLAND AND DISTRICT M.A.C.

The weather at Christmas was good, and it brought a few hardy members out on to the local 'drome. It was a bit rough though, chasing models after a Christmas dinner.

The last meeting brought forth many groans ! The discussion of the S.M.A.E. new affiliation fees forced the club to put the senior members' subs. up to £1. There was no change in the juniors' fees.

Les Clark resigned his position as comp. secretary and Morris Stewart took over the job.

A good collection of models were brought by the juniors for a check-over by the more experienced members ; it was a really grand show and they certainly deserve praise. A Skyleada .5, built by one of them, Hoseason, was a very good effort. I bet they cannot wait to get them out on the field.

George Jackson's latest effort was the famous Schneider Trophy winner S-6, Kalper powered.

John Glendenning is building his O.D. cabin job, incorporating a few new features ; he may be fitting R/C later.

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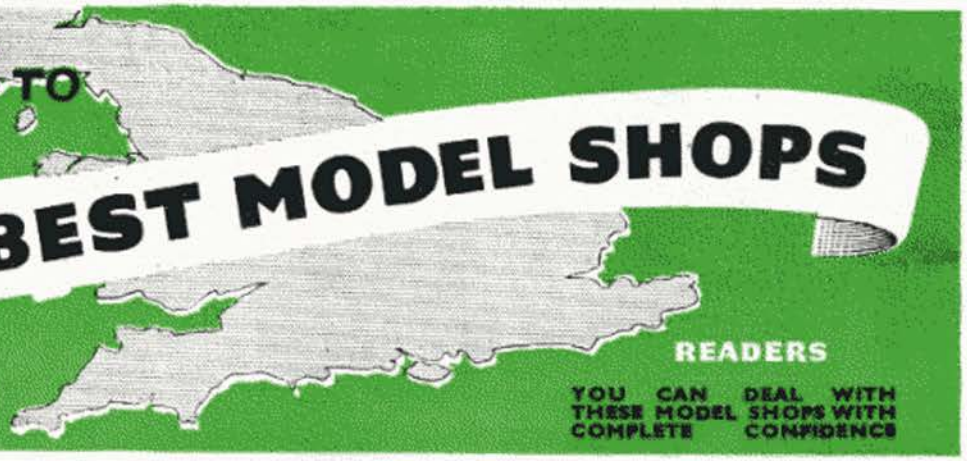

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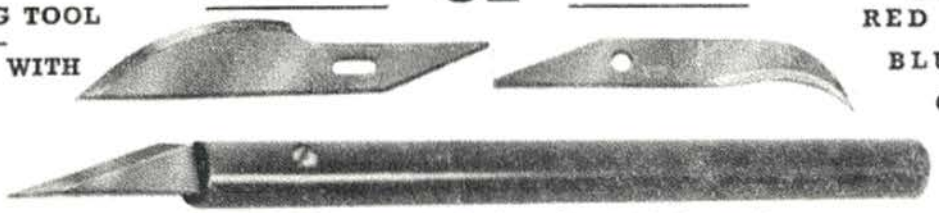

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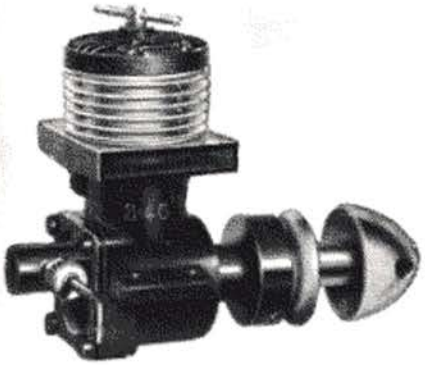

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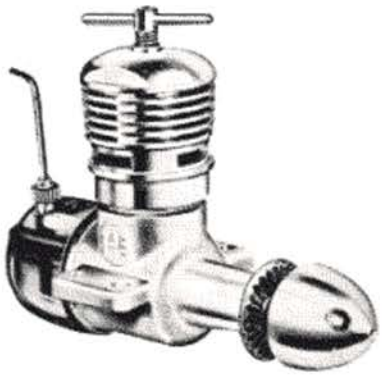

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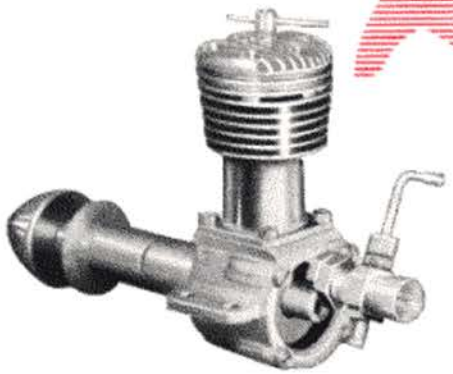

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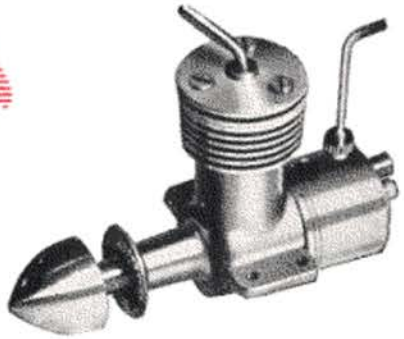

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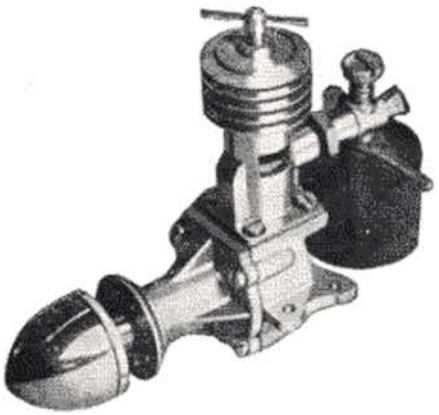

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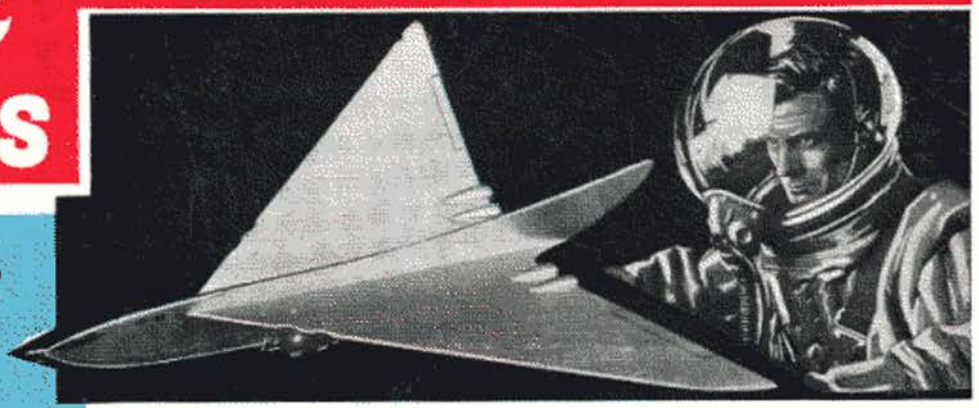

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