MODEL Aircraft

IN THIS ISSUE

JUNE 1950

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THE JOURNAL OF THE SOCIETY OF MODEL AERONAUTICAL ENGINEERS

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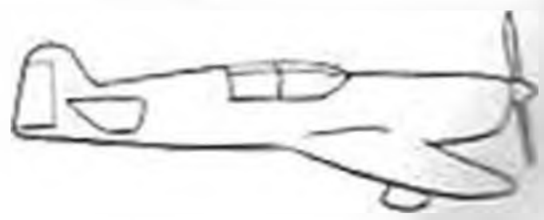

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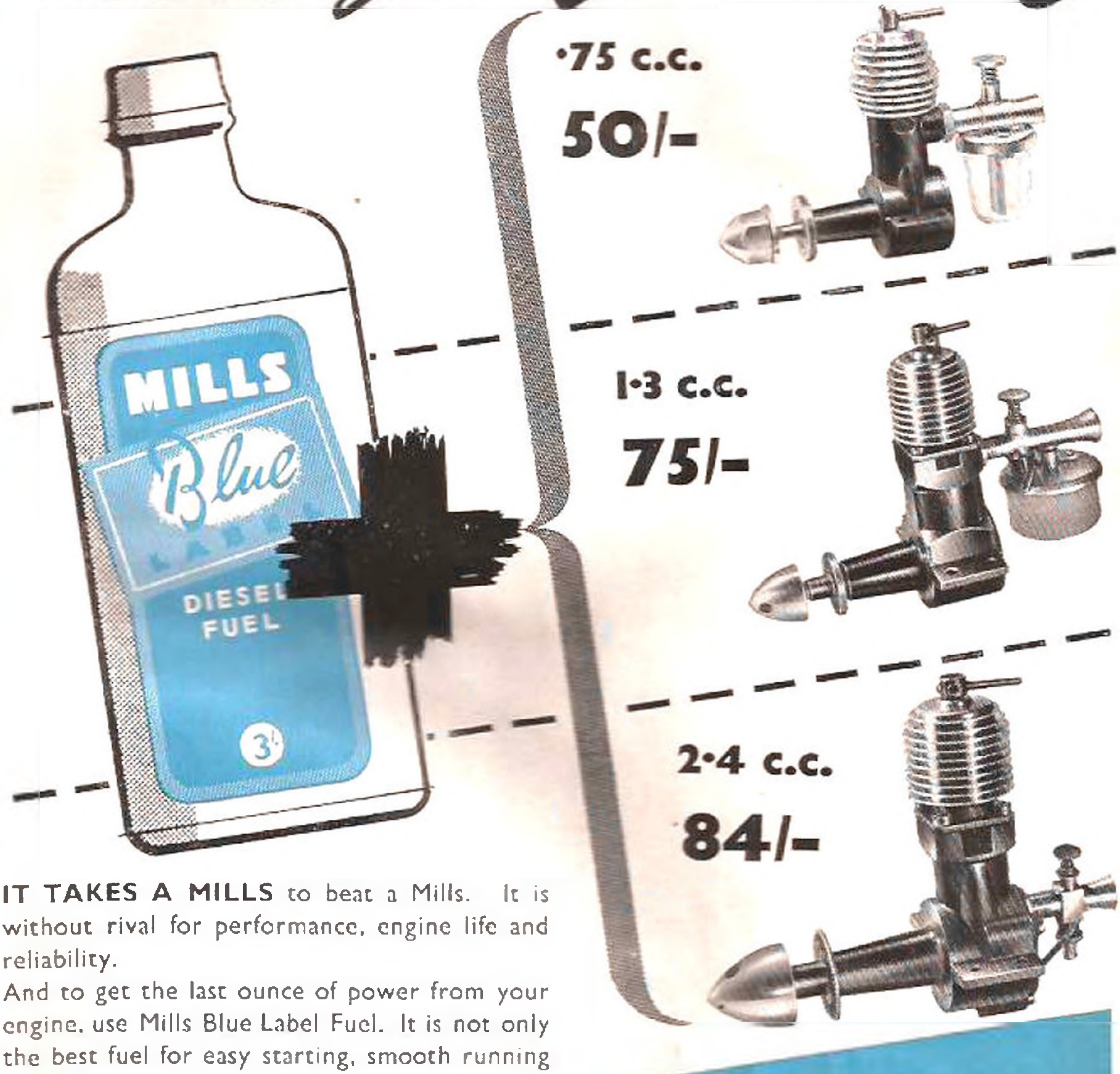

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THE JOURNAL OF THE SOCIETY OF MODEL AERONAUTICAL ENGINEERS

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JUNE 1950 VOL. 9 No. 5

Contents

E D I T O R I A L

JUDGING from the frequent enquiries which we receive from persons desirous of taking part in, or attending international contests as spectators, and some ill-informed articles which have recently appeared in print, there seems to be a considerable misunderstanding of the international competition situation.

All the important international contests are *limited to teams* selected by the national aero clubs of the respective countries and they are not, as many appear to think, "free for all."

Now, in an international event a certain amount of national prestige is involved and it is thus necessary to ensure that a really representative team is selected. This entails, if a fair selection is to be made, holding elimination trials, and this has not always been possible, due to late notice by the organisers of the event.

It is for this reason that the F.A.I. has introduced the Model Calendar on which official international contests are registered at the commencement of the season in order to give every national aero club time to decide which contests it will support. If a national aero club decides that it is impractical to support an event the individual aeromodellist is not in a position to enter the event as an individual, even if he is prepared to pay his own expenses for travelling and accommodation.

The question of international contests has, of course, been complicated in recent years by the difficult "exchange" situation, and for this reason it has been found advisable to grant visiting teams free maintenance for the duration of the contest. This is again a limiting factor and attendance at any meeting uninvited is what is generally known as "gate crashing."

Cover Story

At the S.E. Area Control-Line Championships at Brighton we saw for the first time in this country competitive team racing. Our cover photograph shows the Guildford team's flyer, B. Evans, who gained second place after a keen tussle with Phil Smith of the Bournemouth Club.

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HERE AND THERE

The Editor Comments on Current Topics

EXHIBITION MODELS

During the winter months we have done quite a bit of travelling around the country judging the entries at club exhibitions and at many of these we have seen models which are worthy of the highest praise and deserved a much wider showing. This is also true of the majority of the entries in *Concours d'Elegance* events at rallies.

It is a great pity that so few of these first class models find their way to the largest, most important and most popular exhibition of all, namely, the annual *Model Engineer* Exhibition. This is unfortunate because the model aircraft movement suffers in prestige and reputation in consequence. All too often do we hear modellers in other spheres decry our work as being of an inferior nature—or even not modelling at all.

We may not be fashioning lumps of metal into beautiful or utilitarian articles, but there is no doubt at all about the beauty of line of a well designed aircraft model or of the attractiveness of a well made replica in miniature of the better known aircraft prototypes. We have no need, therefore, to be apologetic and certainly not ashamed of our skill or our hobby, particularly as we submit the work of our brains and hands to far more hazardous conditions than any of the other branches of modelling.

We do not know why the builders of the super models which we have mentioned fight shy of exhibiting the results of their labours to the general public and their fellow modellers at *The Model Engineer* Exhibition. It cannot be because the prizes are inadequate to attract them—certainly they are at least as attractive as those to be won at local exhibitions and rallies. In addition, the silver championship cup which is won *outright* each year is far a more attractive trophy than most of the regular challenge trophies to be gained in the flying contests.

Only by showing the other modellers that aeromodelling displays skill of the highest order and produces models with a quality of finish and appeal equal to their own will we raise aeromodelling to its rightful place in the model making world.

We hope that aeromodellers, particularly those who regularly take part in *Concours d'Elegance*, and local exhibitions, will seriously consider exhibiting their machines at the forthcoming *Model Engineer* Exhibition and thus enable the S.M.A.E. to stage a model aircraft section really representative of the movement and one which will compel attention by its very excellence.

DANISH MODEL FLYING

In a report on Danish model flying activities during 1949 which we have recently received from the Danish Modelflying Union, considerable success both nationally and internationally is indicated.

Danish aeromodellers placed themselves firmly on the aeromodelling map by winning the Nordic glider contest which was last year held in Helsinki, Finland, in July. This contest is a sort of "Wakefield" of the north and well patronised by the Nordic countries. The models taking part were limited to the Nordic A.2 class which the Nordic countries are pressing for F.A.I. recognition as the accepted international specification for all international glider contests.

We will not discuss the merits of the class here as this has been ventilated in our correspondence pages, but there is much to be said for the principle of restricting the size of gliders for international events in view of the undoubted transport difficulties which exist.

This, by the way, is the first occasion on which Denmark has won the Nordic event and we offer them our sincere congratulations.

Denmark also inserted its name in the F.A.I. world record list in 1949 through the performance of Kurt Rechnagel with a distance flight with a flying-wing glider of 576 metres. This record has since been beaten by a superior effort in the U.S.S.R.

Contrary to this country the merit certificate scheme flourishes in Denmark and it is interesting to note that of the 200 gained in 1949 no less than 77 per cent. were obtained with gliders.

It is also interesting to learn that there has been an appreciable decline in the popularity of the large glider in favour of the medium and small sizes and that rubber models are again putting in an appearance, now that rubber is becoming available again, in spite of the handicap imposed by the embargo on the importation of balsa.

An interesting Danish event is the yearly national summer camp where a comprehensive range of contests are staged. This event was supported last year by a few foreign visitors who had been invited as guests.

One of the amenities which the Danish Model-flying Union provides for its members is a plan service of well tried models ranging from the simple beginner's model to the contest types.

On the organisation side the Union has run a lottery in co-operation with other flying clubs of all types in order to raise the funds required for its activities. This is interesting in view of the decision of the S.M.A.E. to run a draw amongst its members to raise the funds for the Wakefield team and it indicates that the basic problems of aeromodellers all over the world are much the same.

We are glad to learn that a closer approach is being made between the Danish aeromodellers and the Royal Danish Aeroclub. The Danish Model-flying Union, to which is affiliated 51 clubs, is now in the process of being dissolved and all Danish model aero clubs will in future be affiliating direct to the Royal Danish Aeroclub who are establishing a special model section.

CONTROL WIRES

At the S.E. Area Control-line Championships, held on Easter Monday, we spent an interesting, and somewhat enlightening, half hour watching lines being given the pull check for strength. In a number of cases the wires failed to stand the load specified in the S.M.A.E. rules and in some instances the whole control assemblies came adrift when the test load was applied.

Since the diameter of the wire affects the speed of the model there is a tendency towards using wires which are too small for safety and thus liable to failure. Most aeromodellers dislike having to calculate the correct diameter of wire to use with models of varying weight and size so the size fixed by the A.M.A. recently will be of interest to all C/L speed fans in this country and, perhaps, save them some grey hairs.

Class A	0.00-0.20 c. in. ...	0.010 in. dia.
Class B.	0.201-0.30 c. in. ...	0.012 in. dia.
Class C.	0.301-0.50 c. in. ...	0.014 in. dia.
Class D.	0.501-0.65 c. in. ...	0.016 in. dia.
Jets	... ...	0.016 in. dia.

The above figures are for steel wires free from rust or kinks.

STARTING SOMETHING !

During the course of a chat which we had at the Brighton meeting with a well-known contest flyer, he raised an interesting point concerning the use of mechanical starters.

He contended that their use did not help to "improve the breed" of power units, adding, that an engine which could only be coaxed into life by means of an artificial starting aid was not a good power plant for the average aeromodeller, and the need to carry around a large battery and electric starter motor was an unnecessary imposition, quite apart from its cost.

The question of cost brought into the discussion the advisability, or otherwise, of allowing the use of mechanical starters in competitions thus giving those able to afford these luxuries a distinct advantage over the less fortunate competitors.

We agreed that there would be an immediate outcry that the banning of mechanical starters would retard progress in engine design, but we felt that progress in engine performance would *still* continue, but not at the expense of startability; and actual engine handling technique on the part of aero-modellers would improve rapidly once it was realised that starting without mechanical aids was part and parcel of the test of skill imposed on competitors. The result would be better engines and better modellers in the long run and general fairness all round.

Model flying contests, our friend asserted, should be a test of the skill and ability of the contestant and not of his ability to obtain special equipment to eliminate his shortcomings.

PARIS MEETING

The Federation Nationale Aeronautique recently called a meeting in Paris of the representatives of national model aero clubs to discuss International contest problems. The matters raised were no doubt dealt with by the F.A.I. at their meeting in Stockholm last month.

Mr. A. F. Houlberg attended both meetings as the British representative and our photograph shows him talking at the Paris meeting to M. Maurice Bayet, the Editor of our French contemporary, *Le Modèle Réduit d'Avion*.

The Second

NORTHERN MODELS EXHIBITION

Reported by D. R. Hughes

Len Gabriels, assisted by W. Archer, prepares to start up his C/L "Gemini" in the arena. He designed and constructed two .4 c.c. diesels for this model. Note the ultra high-geared winder type starter.

HELD at the Corn & Produce Exchange, in Manchester, this year's exhibition was visited by more than 11,000 people during the three days, March 24th to 26th. The model aircraft section was divided into four stands, each displaying a mixed selection of models. This was excellent from the point of view of the visiting public but it must have meant a great deal of walking for the judges, Messrs. A. F. Houlberg, C. S. Rushbrooke and D. Salloway.

It is, perhaps, not surprising that power models were in the majority with sailplanes a good second. Out of a total of 51 entries, 26 were power models—including 8 flying-scale and 4 control-liners.

Outstanding amongst the sailplanes were R. F. L. Gosling's *Silver Tern* and *Nordic Tern*, which gained him the *Aeromodeller* Trophy and third place respectively; one good "Tern" deserves another!

The rubber models section was poorly supported, there being only three senior and five junior entries, but the standard of workmanship on both the first and second place winners in the senior section was excellent, and that of the junior no less commendable.

F. D. Ward's Frog diesel-powered Sopwith *Pup* justly deserved its first place in the flying scale section, with its spun aluminium cowling, detailed Vickers gun, and beautifully carved pilot. The undercarriage appeared to be well sprung, and the model showed signs of use, but not of damage—a tribute to its evident stability.

Special mention must be made of the prizewinning solid model Heinkel He. 60 floatplane, built by Miss J. M. Knowles, which, it was said, was her first model—her style, both in choice of subject and in construction and finish so resembled that of Mr. B. W. Cannon (second place, Heinkel He. 52) that we suspect these two of having more than modelling in common. . . .

First in the power section was the very slick 50 in. span *Firecracker*, by R. Duncan (Cheadle—and a junior!), which had pronounced washed-out wing-tips and an "E.D." Comp. Special on a knock-off mounting. A close second came T. A. Royle's very well finished Arden 0.199 (spark ignition) *Powerhouse*. Two R/C models were entered in this section, and appeared to be of equal merit, namely, those by W. S. Nield (Cheadle) and J. A. Bell (Manchester).

C. B. Jackson, of Ashton, took first and second places in the C/L section with his *Marlin* and scale

Globe Swift, which were exceptionally well finished, the latter including full cabin interior details.

Among the junior entries, H. O'Donnell's 6 ft. span F.A.I. sailplane was easily the most outstanding. It featured an octagonal fuselage, high A/R tip-dihedralled wings and a raised, lifting section, tailplane. Of the junior rubber models, R. Duncan's modified *Korda* outshone many a senior model we have seen.

In the Working Models Arena, Len Gabriels and his Oldham team-mates did a splendid job in keeping the spectators entertained by flying several types of models. A break in these activities was made, on the last day, for prizegiving, when the trophies and prizes were presented by Mr. R. H. Fuller (general manager of Messrs. Bassett-Lowke Ltd.) deputising for Mr. W. J. Bassett-Lowke himself. The arena was a masterpiece of ingenuity—especially so in view of the very short time in which the entire exhibition had to be set up, and very great credit is reflected upon the organisers whom, we feel sure, feel amply rewarded by the undoubted popularity of the show.

MODEL AIRCRAFT SECTION, PRIZEWINNERS

		Name	Type
Power Models			
1. R. Duncan	Cheadle	*Firecracker*	Pylon Contest
2. T. A. Royle	Salford	*Powerhouse*	Arden .199
3. W. Archer	Benchill	*Cosmic Rave*	88 in. Contest
Rubber Models			
1. T. Whalley	Whitefield	*Own Design*	Wakefield
2. P. J. Royle	Broadheath	*Modestor*	Wakefield
Flying Scale			
1. F. D. Ward	Ashton	Sopwith *Pup*	1½ in. scale
2. D. R. Hughes	Merseyside	Avro 504k	13/16 in. scale
3. M. West	Southport	Percival *Proctor*	1 in. scale
Sailplanes			
1. R. F. L. Gosling	Merseyside	*Silver Tern*	7 ft. F.A.I.
2. J. M. Halley	Southport	*The Saint*	Hatchet
3. R. F. L. Gosling	Merseyside	*Nordic Tern*	A/2 class
Control Line			
1. C. B. Jackson	Ashton	*Merlin*	Stunt
2. C. B. Jackson	Ashton	*Globe Swift*	Scale
Solid Models			
1. Miss M. Knowles	Sale	Heinkel He 60	1/72nd.
Junior Rubber			
1. R. Duncan	Cheadle	*Korda*	Wakefield
2. G. Evans	"		Lightweight Contest.
Junior Sailplanes			
1. H. O'Donnell	Whitefield	Mjolnir Mk. 6	(F.A.I.)
2. R. Faulkner	"		Mick Farthing lightweight.

(Left). The model on the right is a Heinkel H.E. 60, by Miss J. M. Knowles and the H.E. 52 on the left is by B. W. Cannons. They were placed First and Second respectively in the Solids Class.

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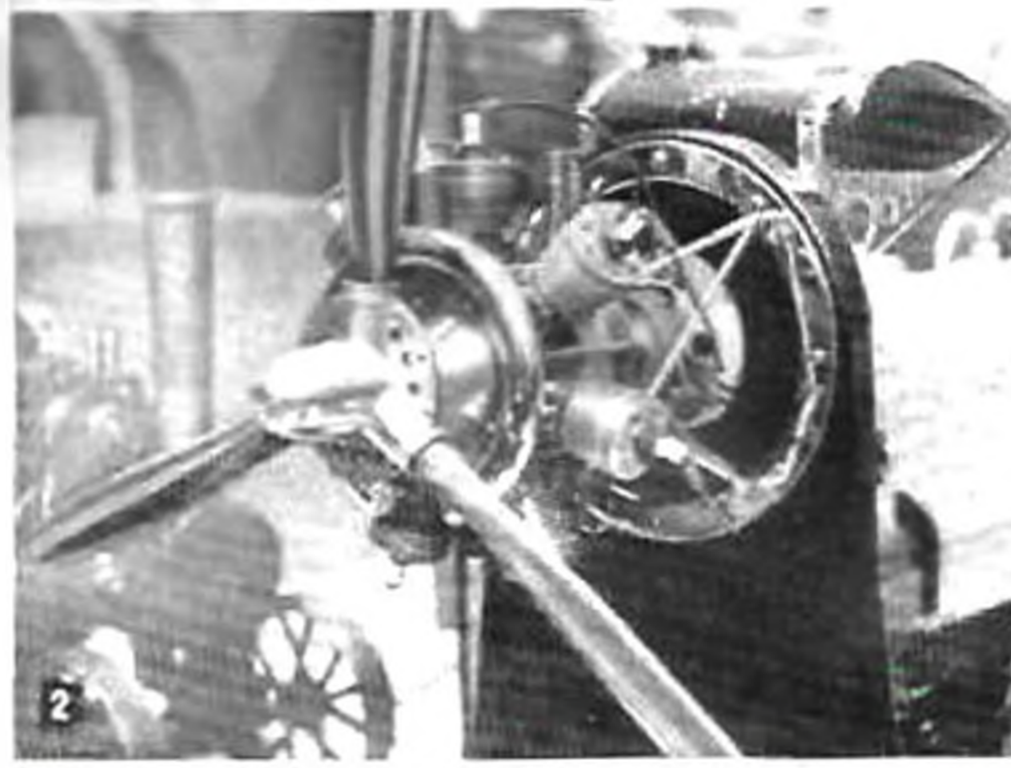

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1. F. D. Ward's 1½ in. scale Sopwith "Pup," which was awarded First Prize in the Flying Scale Section.

2. Of interest to model aircraft enthusiasts, this fine 30 c.c. seven cylinder radial engine, by D. Innes of Prestwich, was exhibited in the Model Engineering Section.

3. The 30 in. span Free-Flight Avro 504K, designed and built by D. R. Hughes (Merseyside) which gained second place in the Flying Scale Section.

4. R. F. L. Gosling with his two prize-winning "Tern" sailplanes.

TYCOON

by Cyril Mayes

IN last season's important C/L stunt contests *Tycoon* had many successes, including the following:—S.E. C/L Championships, Dover, 1st and 2nd; British Nationals, Gold Trophy, 2nd, 3rd and 5th; All-Herts Rally, 1st.

Nicely made, this model can be guaranteed to flatter any non-expert stunt pilot with its smooth manoeuvres. Recommended motors are Elfin 2.49 Mills 2.4, E.D. III, E.D. IV, Falcon 2.5, Amco 3.5. Motor-mount shown is for E.D. III, line length 57-62 ft. .011 diameter. Weight of E.D. III version is 14 oz. Area 260 sq. in. Span 37 in.

Construction

As the majority of the construction is quite straightforward, only the more difficult parts are described.

Tank

Make the tank from an old cocoa tin or shim brass or copper. Cut the top and bottom in one piece and bend to shape. Solder the single joint; then add all three tubes, soldering the ends of the tubes to the tank for security. Solder oversize sides on, trim with snips (or scissors!) and then resolder. Use Baker's Fluid throughout. Test the tank by immersing in water, blocking two tubes and blowing hard into the third. Some fuel tubing as an extension greatly helps this performance. Mount the tank with Durofix, making sure the feed-pipe is exactly level with the jet.

Wings

Construction of the wings is greatly facilitated by placing a length of ¼-in. square balsa on the plan about 1/3 chord forward from and parallel with the T.E. Mount the lead weight in the outer tip with Durofix. On no account omit this weight—it is one of the secrets of success.

THE DESIGNER . . .

Age 23 years . . . Electrical engineer . . . Member of the West Essex Aeromodellers . . . Spent three years in Wales as a Bevin Boy and whilst there became keen on slope soaring . . . A versatile modeller—builds anything and everything, except jet models and kits.

Controls

Watch that the lead-outs are exactly equal in length and do not foul the holes in the fuselage.

Covering

Use either Jap or Burmese tissue for covering. Apply at least two coats of full-strength glider dope. For brightness use a single thin coat of French enamel varnish. This gives a very even colouring without the addition of weight. Yellow is by far the best colour to use, with black for trimming, these being the colours of the original *Tycoon*.

Fuel

Of utmost importance in competition stunt flying is the use of a fuel (and engine) which will give high power and consistently smooth running at between 8,000 and 9,000 r.p.m. "Screaming" revolutions of 11,000 p.m. and more are not only difficult to manipulate, but greedy on fuel and often damaging to lightweight airframes.

Fuels used in the various *Tycoons* are:

(*a*) Gas oil 40 per cent.; Castrol Grand Prix 30 per cent.; ether 30 per cent. To this add ½-1 per cent. Amyl nitrite.

(*b*) Paraffin 50 per cent.; Esso Racer 20 per cent.; ether 30 per cent. To this add 2-5 per cent. amyl nitrite.

(*c*) Mercury No. 3.

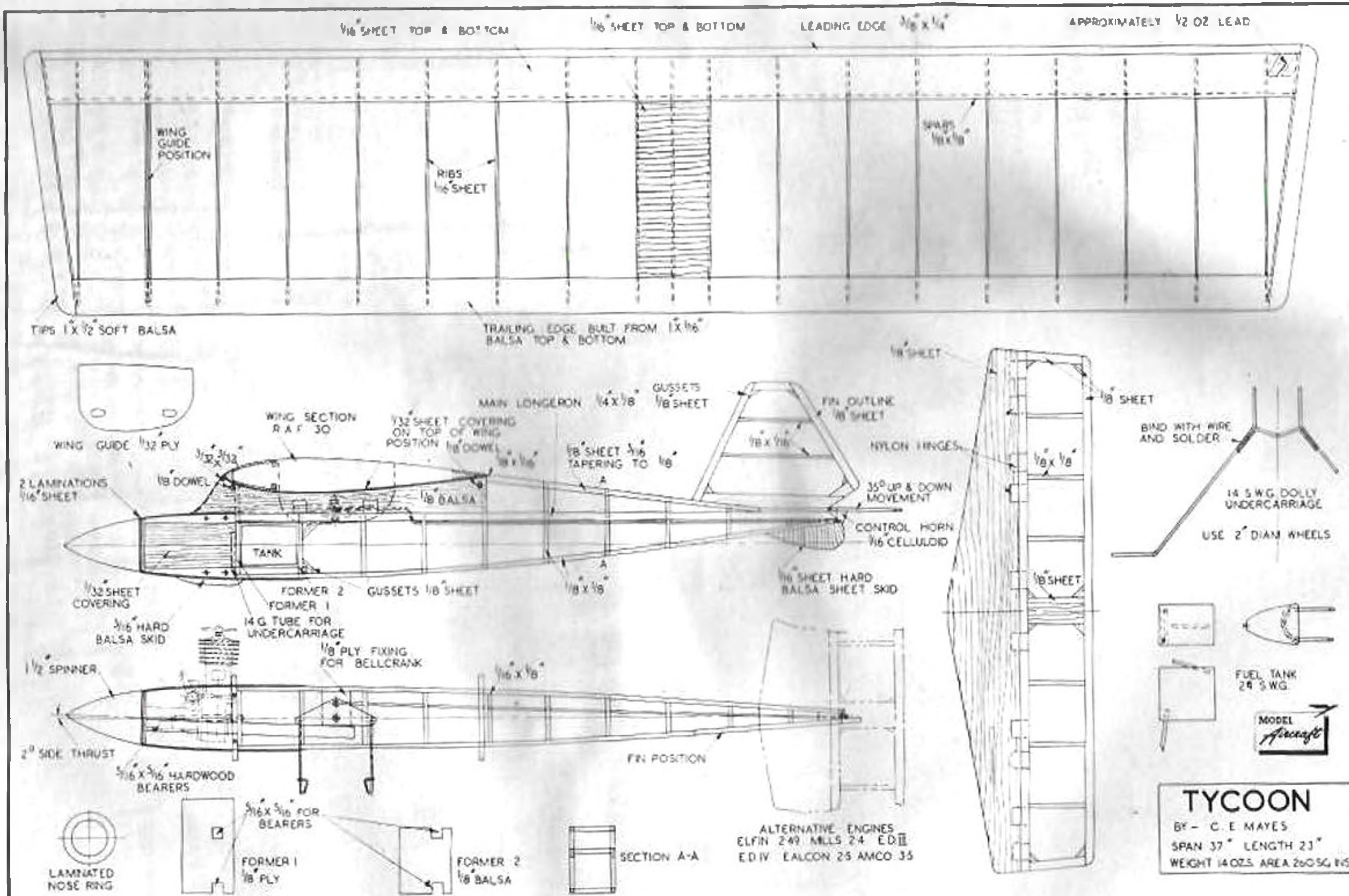
Propellers

The E.D. III original used 10-in. × 6-in. home carved wood propellers similar to the "Tekni-Flo" variety. Of the new plastic propellers, a 10-in. × 8-in. "Truflex" (green), cut to 9 in. diameter, gives the best performance.

Flying

Always set your motor by first trimming to maximum revolutions and then slightly increasing compression and fuel richness shortly before take-off. Allow a couple of reasonable circuits before attempting

(*Continued on page 148*)



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MODEL REPORT

By Ron Warring

Harold de Bolt's *SPORTWING*

WE make no apologies for introducing another de Bolt design in this series. Even in America, where the Californian area is regarded as the birthplace of all C/L development, de Bolt is rated as amongst the leaders—despite the fact that he operates from the opposite (East) coast. The various de Bolt designs which have been kitted—the *Bipe*, *Dmeco Senior* and *Junior*, *Speedwagon* and *Stuntwagon*—have all proved their worth in contests. They are, in fact, the only commercial C/L designs which have really made their mark in the contest world.

But quite apart from the fact that each new design is typified by outstanding performance, every new model is also *different*. And it takes a lot of ability to be both different and successful these days!

Predecessor of the *Sportwing* was, of course, the *Stuntwagon*—a large area mid-wing monoplane with a very short coupled tailplane. Tail moment, in fact, was reduced to almost negligible proportions, making for extreme manoeuvrability without excess elevator power. Large elevators with correspondingly large movement do not make for ease of control particularly on a long moment arm. There is a definite danger of stalling the model in sharp pull-outs. Short coupling has produced some really easy-to-fly stunters and this design configuration has, in fact, become the rule rather than the exception. The *Sportwing* carries this to a logical conclusion in hinging the elevators on the trailing edge of the wing itself and dispensing with the fixed tailplane entirely.

Flying wing control-liners have, of course, appeared before the *Sportwing*. In fact, about a year ago the all-wing stunter enjoyed a considerable vogue in this country, ranging from purely circular or rectangular wings, to the more realistic looking layouts with a definite fuselage and swept-back surfaces.

The *Sportwing*, however, is not just another flying wing design. It incorporates enough original features to put it in a class of its own and has, at the same time, rather an attractive appearance.

Main point of interest is that the wing is swept forwards. Aerodynamically there are various benefits to be gained by sweeping forward a wing. Sweepforward, in fact, may be better than sweepback on some flying wing layouts, as applied to free flight. But how far free flight aerodynamics have any bearing on C/L model performance and stability is debatable. Probably so very little as to be almost ignored, as regards planform shapes, at least.

There is the point, however, that sweeping forward the wing in this manner has the effect of moving the relative C.G. position forward. The *Stuntwagon* appeared to be at fault in this respect, for with the type of construction shown it was almost impossible to get the C.G. in the right place without adding ballast to the nose. It invariably came out well aft, often as far aft as the pivot point, when stability on the line became marginal. In other words, rigged with the C.G. roughly on the pivot point, the model was always tending to come in all the time, and high altitude manoeuvres were more or less out of the question. The model just had to be ballasted to fly properly.

Design C.G. position for the *Sportwing* is on the leading edge of the wing at the centre section, which should be achieved quite readily with a 4 to 5 oz. motor. The pivot point is then 1¾ in. farther aft and it would appear that there might be a possible margin of about ¾ in. aft movement of the C.G. without running in to much trouble. It should be noticed, however, that the control hook-up is contrary to normal stunt practice. The elevator horn comes above the elevators, so that the *front* line becomes the *up* line. De Bolt seems to do this quite frequently.

The other point of note is that the *Sportwing* is laid out to fly clockwise circuits, again opposite to normal practice, but unlike some other de Bolt designs the layout is symmetrical and so it can be modified to fly normal anti-clockwise circuits without any harm being done. The thrust line is straight—no sidethrust—and only the ballast weight requires shifting to the starboard wing tip and the lines relocating in the port wing.

Use of tip ballast is now very common in all stunt models and it has certainly proved beneficial. Normally one adds just sufficient weight to balance out the weight of the lead wires, etc., in the opposite wing, but the ¾ oz. specified here definitely overbalances the model so that the final C.G. of the model is actually slightly outboard of the centre line. This in itself is quite useful.

The *Sportwing* makes no pretence of being a contest model, as such. The whole layout appears to be rigged to give a full range of manoeuvrability with an adequate safety margin. In other words, a model which will perform all the stunts in the book, but at the same time prove reasonably easy to handle. The designer, in fact, himself emphasises this point.

Gross wing area of the design is 250 sq. in. with a design total weight of 14 oz. Loading therefore works out at 5.6 oz. per 100 sq. in. or 8 oz. per sq. ft. Light enough for complete manoeuvrability. At the same time the construction is very rugged, and the total weight low enough so that it should be possible to get away with crash landings with little or no damage. Flying wings are often quite good in this respect. The *Stuntagon* is another model which can survive a nose dive into earth with no damage other than a broken propeller. In both cases the semi-solid fuselage is strong enough to resist breaking up.

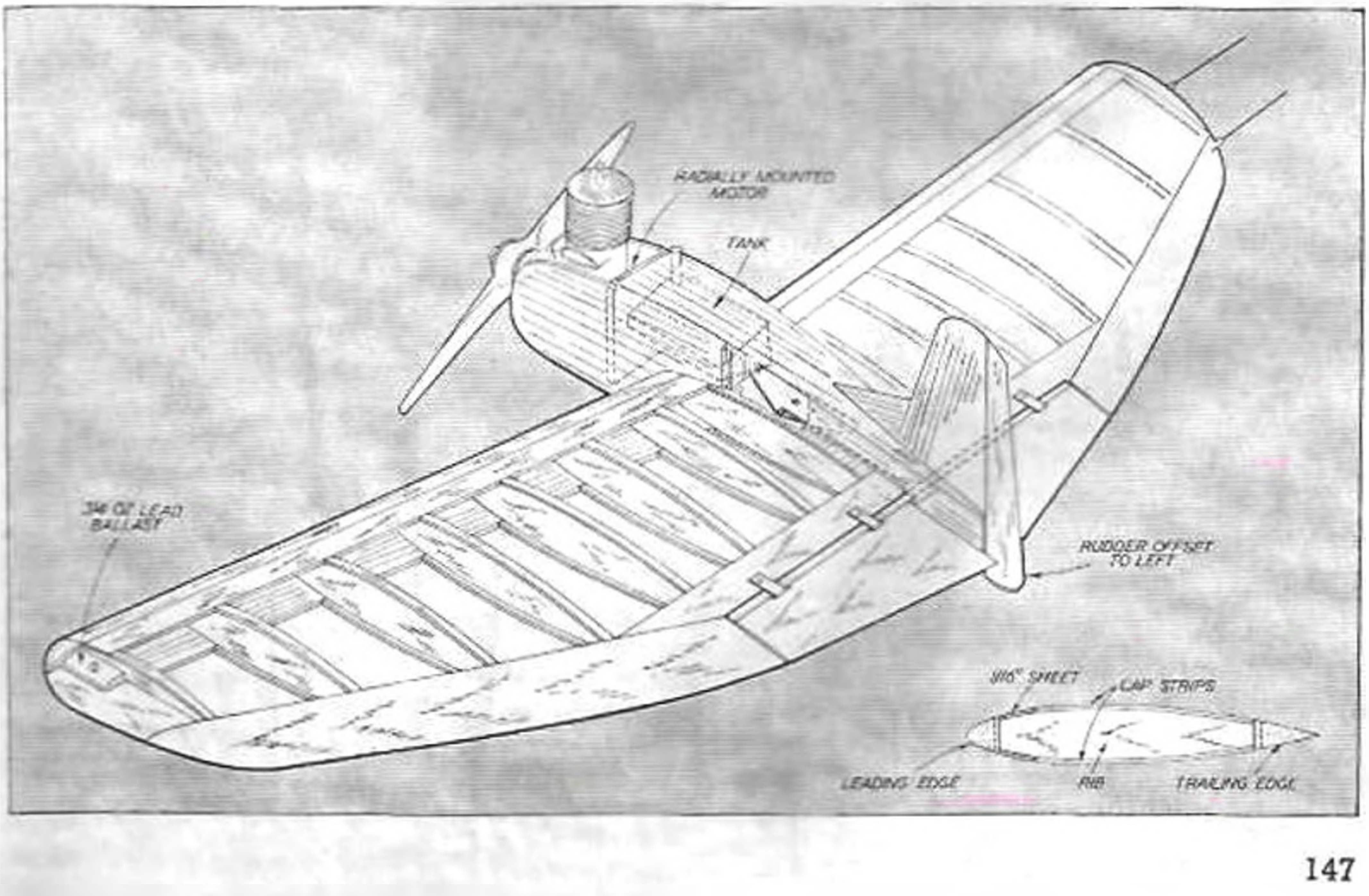
The total weight specified can only be achieved with glow or diesel power plants. The range of sizes specified as suitable is from 0.19 to 0.29 cu. in.—roughly 3.25 to 5 c.c., Ohlsson "19's," "23's" and "29's" being particularly favoured in the States. Unlike the spark-ignition versions, these rotary valve glow motors can prove particularly troublesome to start, especially on British fuels. Main trouble appears to be that they are really over-ported and partially blocking up the air intake with a balsa plug often works wonders. Otherwise it is a case of plenty of practice to find just the starting technique required, particularly with the "19" and "23."

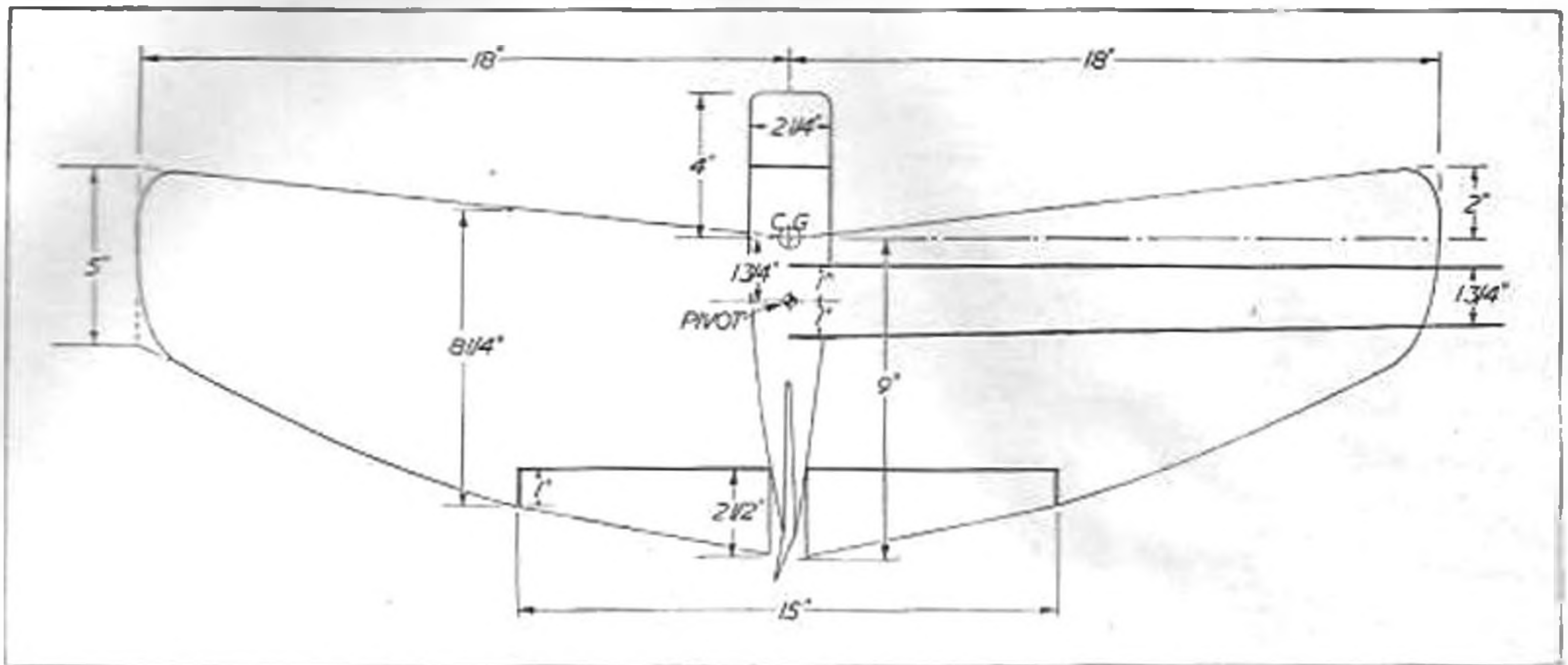
In this country we now have a range of glow and diesel motors which would well fit the *Sportwing*, although the writer would personally consider that there is insufficient wing area for any really hot motor much above about 3.5 c.c. All-wing designs of this type have quite a low drag and fly quite fast, which is certainly not the easiest way of going about stunt flying for the fun of it. De Bolt claims a normal high speed of 75 m.p.h. for the design, although with which motor is not specified.

Emphasising the point that short-coupling requires only a small elevator area, we find that these are only 10 per cent. of the gross wing area (25 sq. in.). The distance from the C.G. to the hinge line of the elevators is only $6\frac{1}{4}$ in. In common with a lot of other American kit plans, no specific control hook-up is described on the plan—only the line positions and pivot point. Thus actual control movement is left open, although it would appear that about 90 degrees up and down movement should be adequate. The control horn is very short—only just over a quarter of an inch above the centre line of the elevators—and a $\frac{3}{8}$ in. moment arm is shown for the bell crank, so this should be achieved with relatively little bellcrank displacement. In other words, elevators should respond quite rapidly to control handle movement and may even need toning down (such as by using a handle with close-spaced lines), especially for relative beginners.

Structurally the wing is quite interesting. It is really a modified form of sparless construction with solid leading and trailing edges and $\frac{1}{16}$ in. sheet ribs with $\frac{3}{16}$ in. × $\frac{1}{16}$ in. cap strips. An additional horizontal strip of $\frac{1}{16}$ in. balsa, $\frac{3}{4}$ in. wide is let in flush with the ribs adjacent to the leading edge, this being clearly shown on the cut away drawing. This has the effect of virtually increasing the size (and thus the strength) of the leading edge spar and making the whole wing frame much more rigid in a fore and aft direction.

In a crash landing, many wings fail in this respect. The fuselage hits the ground first, when the inertia of the wings tends to carry them forwards. Failure





generally occurs just outside the strongest point, which is usually where the wings join the fuselage—so the wing panels just break right away.

Fuselage of the *Sportwing* is a very simple structure. Built on the semi-solid principle, base is of ¼ in. sheet balsa with sides of ⅛ in. sheet reinforced inside with $\frac{1}{16}$ in. sheet forward of the wing. The top of the fuselage is covered with ⅛ in. sheet, all corners then being rounded off by sandpapering. A single ⅛ in. sheet balsa former is located just in front of the control pivot point to stabilise the fuselage "box," with a ply firewall at the forward end of the fuselage to carry the motor. Radial mounting is specified, although beam mounting could also be accommodated by cementing hardwood bearers to the balsa sides with suitable reinforcement. The tank is boxed in the fuselage aft of the firewall and resting on top of the wing. It is of the normal wedge type, opposite handed. The wing, elevators and control system are built as an integral unit. The fuselage is merely an appendage carrying the motor and the vertical tail surfaces.

For normal sport flying, the *Sportwing* can be fitted with a conventional fixed undercarriage, the wire legs being fastened to the firewall with "J" bolts. Otherwise twin-leg drop-out gear is used, plugging into a hardwood block in the bottom of the fuselage immediately in front of, and cemented up against, the firewall.

Modellers who prefer something out of the common might well study the *Sportwing* layout for it is an efficient stunter. At the same time, although it is a flying wing, appearance does not suffer to the same extent as it has in many other designs of this type.

Tycoon

(Continued from page 145)

more violent manoeuvres, to make sure the motor is running correctly. Perform all manoeuvres smoothly, trying to keep the flying speed as high up as possible. Do not apply full "up" or "down" for any manoeuvres, but follow the model with your arm. Only exception is that most difficult of all manoeuvres, the truly square loop. If you are unacquainted with inverted flight, the best approach to learning the art of opposite control is to constantly practise consecutive horizontal eights, gradually lengthening and lowering the inverted "down" part of the manoeuvre until you can complete a whole circuit. If in the initial stages you remember that full "down" will bring you back to safety, you will soon be "lapping up the old low level inverted," as a distinguished member of our club would remark. As this model flies at between 56 and 58 m.p.h. with an E.D. III 10 × 6 propeller combination, it is quite possible to recover from inverted flight with a dead motor so long as the wings are not stalled in a high speed condition.

Good luck with your *Tycoon*—it can easily win a contest for you!

The model illustrated above is one of the early prototypes which were fitted with single leg undercarts.

Northern Notes

★ MENTION OF the Gamage Trophy in the North, in fact nearly anywhere in the country, always brings to mind howling gales, pouring rain, and the rest of the unfriendly elements. In spite of this there still seem to be some bods brave enough to leave their beds and try their skill. Personally, I would like the Society to give this Trophy a more suitable date in the contest programme in an attempt to ensure more favourable weather. I have not yet heard what sort of weather the South "enjoyed," but if it were only half as bad as that in the North, it was still too bad for flying.

★ TO THE Northern Area bods the entrance of Spring is not heralded by the surreptitious peeping of snow-drops, or the gentle note of the cuckoo, but rather by the raucous demand of the N.A. Secretary with his insatiable request for "another bob for the fiddle." This gent was again hard at work at the N.A. Spring Rally, and it was noted that in spite of a heavy limp he still managed to catch up with everyone there. I have been asked if the rather violent sports coat he effected was for the purpose of weakening sales resistance, since many people had to shade their eyes on its approach but nevertheless were well and truly hypnotised into parting with at least one bob in the hope of acquiring the McCoy 19 being fiddled. Winner was Miss Bridget McCann, of Worksop. Lucky girl, many a lass has found a really good husband with far less to offer as a dowry.

★ THERE WAS a really good turn out of clubs for the Area Spring Rally at Rufforth, and whilst the conditions could not be said to be ideal, they were at least a decided improvement on the "Damage" Sunday. The weather during the morning was quite good; warm, and with just a faint breeze. But, as so often happens, the breeze freshened into a strong wind during the day, and, of course, completely changed direction, adding to the organisers' difficulties and to model recovery. The flying did not seem to be up to the usual Northern Area standard, in fact very few really outstanding times were turned in. I noticed Ted Muxlow, the Rubber King of Sheffield, doing a nice spot of consistent flying to top the Gutteridge list of 48 entries with a 534 sec. aggregate, closely followed by that up and coming pair, Stan Eckersley, of Bradford and Vic Duberry, of Leeds.

★ ONE OF the surprises of the day, to my mind at least, was the absence of the Lees family, and our old friend, Len Stott. Can it be that the lure of the dry fly is proving more attractive than that of well lubed rubber? Ron Calvert, of Bradford, too, seemed to be having an off day and gave out the idea that he was more or less retiring from the contest field. Seem to have heard these kind of remarks before somewhere.

★ THE DARLINGTON club have an improving comp.-minded youngster in Thompson, who walked away with the Open Glider Contest (and the cash prize) to be chaired back to the 'bus by his club mates. A first prize no doubt provides quite a number of pints on the long journey home.

★ THE BIGGEST flop of the day was without doubt the R/C event. We had been expecting, in view of the large amount of quiet boasting that had gone on, to see a flock of models in the air, but only two entries was a shock indeed; bigger shock than ever was to learn that both had cracked up on test flights. The shocks were tempered by a touch of humour when the three Sheffield stalwarts, Exley, Gordon and Walker, after expressing their feelings at R/C gliders not being allowed to enter the Ripmax, strode forth to demonstrate how R/C model *should* be flown. The first three minutes of the demonstration were faultless, but after losing radio control, the team lost all self control and were last seen disappearing over the horizon in fast pursuit of the errant model.

★ OUR OLD friend Silvio (whose photograph appears above) now seems to find it necessary to have two cars for recovery purposes, much to the envy of poor blokes like me who still have to rely on two legs. He seemed to spend more time outside the 'drome searching than he did inside flying, and lost at least one model. Nevertheless, he managed to top the poll in the Halfax with an aggregate of 393 sec. Talking of Silvio; one of the neatest jokes on record was enacted at the Bradford club during the night previous, when permission was requested of the President at the end of the prizegiving to make a special award to the aforesaid Silvio. This consisted of a mounted radiator mascot, neatly filched from Silvio's own car by some of the Bradford 'erbs!

LONDON AREA

1. C. Hawkes of the Battersea & District M.A.C., whose *Rudder Bug* was dogged by engine trouble throughout the Taplin Trophy Contest.

2. P. Buskell of Surbiton & District M.A.C., winding up for one of his Gutteridge Trophy flights.

3. Norman Marcus (Croydon & District M.A.C.) gets his Wakefield away in fine style. It was one of the fastest climbing models seen at Fairlop.

4. The best radio-controlled flight seen this season was made by F. H. Ashdowne of the Southend Senior Club, who is here seen launching his *Falcon*.

5. G. Honnest-Redlich prepares his tried and trusty *Gee Whizz* for flight. He tied with F. H. Ashdowne in the R C contest with 310 points.

6. Well known "Model Aircraft" contributor, Ron Warring gets ready to fly in the Wakefield Trials. Despite one poor flight he finished 20th.

7. Cyril Mayes of the West Essex Club, designer of the *Tycoon* which is featured in this issue, launching his Wakefield Trials entry.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SPRING RALLY

8. Bill Taylor of West Essex gives his model a good send off in the R/C event. The model and the R/C equipment are of his own design.

9. H. Lelever gives his Wakefield the "[illegible]" as it gets away for one of its Gutteridge Contest flights.

10. F. H. Ashdowne and his son, winners of last year's Taplin Trophy contest, preparing their "Falcon" for its next flight.

11. Alec. Wilson of the Hayes and District Club entered his tailless model in the R/C contest. For details of this interesting model see "Photonews" on page 180.

12. Ilford Club member, Bob Amor, competed in both the Gutteridge and Halfax events. He spent most of the day retrieving his power model.

13. Ron Warring's model taking off for a maximum flight in the first round. The model was his [illegible] Wakefield Contest entry.

14. Most of the models entered in the Gutteridge were of conventional design. One of the few unorthodox models was this design by F. G. Draper of the Hatfield Club.


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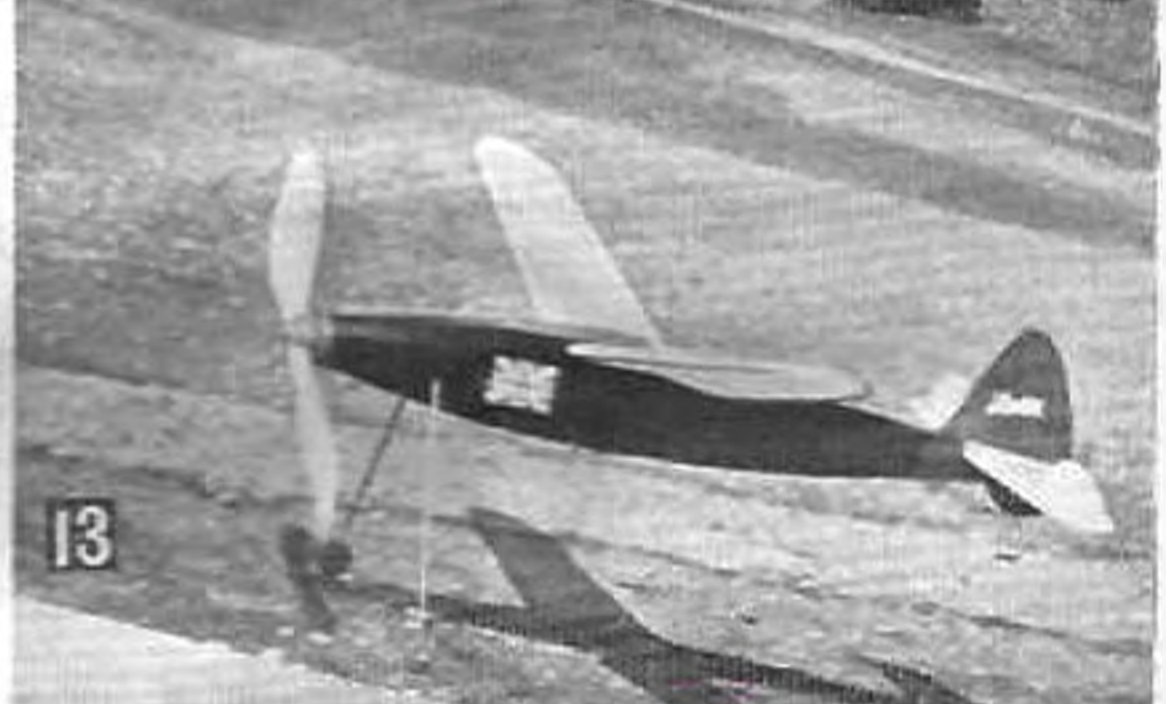
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● WITH THE largest ever entry in a British all C/L contest, the S.E. Area Championships promised to be an outstanding date in the aeromodelling calendar. Unfortunately the weather was just about as bad as it can get (remember Easter Monday?) and it was a saddening sight to see so many fine models smashed as a result. Contest controller Harry Rewell told us that over 300 entries were made prior to the contest and a large percentage of modellers flew in spite of the wind and rain.

With seven flight circles in operation, it was impossible for one person to see everything that went on. So if we missed your sensational model (or performance!) please accept our apologies. First, the speed results. Cyril Shaw proved that he is still a leader in the field by taking 1st in Class 1 with his Allbon powered kit design—which we mentioned in the last "Power Talk." Speed was 72 m.p.h. Engine designer Allbon was close behind, with 66.7—his model featuring a single blade propeller. Shaw's speed was faster than last years' (Dover) winner and the existing Class 1 record—but alas, he didn't use the pylon.

In Class 2, the winning times were 90 m.p.h., by D. W. Free (Elfin 1.8) and 82.6 by F. A. Wilson—both well ahead of Ken Muskett's 68.17 win last year. Class 3 boosted the largest number of entrants in any one speed event (we think!)—but out of 57 entries, 40 attempts were made with no results. And take it from us, some of those Class 3 jobs looked really promising. E. Salter won Class 4 at 66.7—20 m.p.h. lower than last year—with the only recorded flight.

Cyril Shaw flew his old *Hearse* record holder (118.42) and won Class 5 at 108.5 m.p.h. Pete Kelsey was hot on his heels with 105.5. Both models were fitted with glow-plugged McCoy 49's. Highest speed ever recorded by a piston engined model in a British contest* was credited to N. G. Taylor, of the Wimbledon Power Club. Taylor beat his own British record (111.1) with 132.4 m.p.h., to win in Class 6. The model was fairly conventional, with a drop-out type U/C. Power plant was a McCoy 60 driving a 9 × 12 prop. Tail-surfaces were of metal. P. W. Evans (of Weston) also bettered the existing British record to gain second place with 112.5. Taylor also took third place with another model at 110.5. Ron Stovold won Class 7 with his Dynajet powered original at 143.9. Last year's winner, D. Foskett, took second place with 125 m.p.h. Record claims have been submitted for these last two winning times. Personally we shall be very surprised if these speeds are beaten in 1950. Some speed fans claim that a damp atmosphere is just the thing for building up the revs (and the jet pulsations?).

The Open Stunt event was an all West Essex triumph—with "Funf" Taylor and "Stoo" Steward tying for first place. Ken Muskett and Den Allan took third and fourth respectively. The standard of stunt flying was amazingly high considering the gale that was blowing across the field. "Stoo" was flying one of the new H.J.N. *Musketeer* designs. Den Allan did well to place so high with his lightweight—an Allbon powered *Boxcar* type—as the heavier loaded models had a definite advantage in the prevailing conditions.

Norman Butcher repeated his 1949 success to win the scale stunt event with a beautifully finished *Fokker D.7*. There were some fine models entered in this event. We particularly liked Pete Westbrooke's Atwood Champion powered *S.E.5* (40 in. span, 560 sq. in. wing area and all-up weight of 3 lb. 10 oz.). Other interesting models in this event included a *Boomerang*, *Sopwith Pup*, *Sea Fury*, *Bristol Monoplane*, *Tipsy* and several *F.W.* 190's.

Phil Smith won the scale speed contest with an Amco 3.5 powered *Spitfire*—at a speed of 72 m.p.h. (and 80 per cent. for finish). We saw little of this event (we moved away after Phil's Amco came adrift from its moorings in mid-air!), but spotted many scale speed designs in the competitors' enclosures—including a *Gee-Bee*, *P-Shooter*, *M.E.* 109, *Mew Gull*, and a Fox powered *Pesco Special*. Incidentally, points in both scale contests were awarded for finish and flying. Scale expert H. J. Towner judged these events for "Finish" and H.J.N. got his feet very wet judging the scale stunt.

The team racing event was probably the hardest hit by the bad weather—a pity, since this new branch of the hobby could do with some favourable publicity to boost interest. However, some good models were entered—many of them based on American Goodyear Trophy racers. The final was flown off shortly before the contest was due to close—when the wind had died down considerably—and a grand show was put on by the Bournemouth, Guildford and St. Albans teams. Phil Smith—Bournemouth's flier—had to change hands at one stage, to prevent his lines from fouling those of the other competitors. The St. Albans entry crashed early in the race, after a wonderful mix up in the centre of the circle. From this point onwards it developed into a steady battle between Phil Smith and the Guildford flier B. Evans. Both modellers had trouble with the St. Alban's "wires" which became tangled in their

* Previous best was 119.7 by Shaw's *Needlenose*—flown by the writer.

legs as they pivoted round—much to the amusement of the onlooker.

It seemed anyone's race round about the nine mile mark, but Evans suddenly dived in vertically and crashed for no apparent reason. Shortly afterwards Phil landed to refuel and then took off again to complete the remaining few laps to win. Phil took it nice and easy until he passed the winning post, then gave the equivalent of a victory roll—in the shape of some polished loops—followed by a few laps inverted. The engine cut while he was still flying inverted, but he managed to bring it in safely. The winning design was Veron's new kit version of the *Long Midget* (formerly *Midget Mustang*)—and was, like all of Phil's models—beautifully finished. Speed was about 44.5 m.p.h., to give yet another win to the "professionals," who carried off eight of the eleven first prizes.

Here are just a few of the models that caught our eye at Brighton: A lightweight type team racer by Norman Marcus. Powered by a "Glo-Torp," this job looked very promising on the practice circle . . . An unusual twin boom speed design, powered by a McCoy 49, designed by Ed "Shadow" Rogers. . . . We liked the workmanship of John Coasby's silk covered 850 sq. in. stunt design. Fitted with a McCoy 60, this model is usually flown on 100 ft. lines. . . . Ron Prentice and Pete Westbrooke also turned up with outsize stunt jobs—but unfortunately both these designs were wrecked in the contest. Ron's model made an appreciable crater when it hit the deck. . . . D. Foskett had two new interesting Dynajet designs—one with swept forward wings and the other with elliptical flying surfaces. From the other side of the ground, we saw one of these models crash and disentegrate. Pieces flew amongst the spectators, but luckily no one was hurt.

In conclusion, congratulations to all those responsible for the organisation. And hats off to the contest winner who celebrated in the traditional manner (Hic!) and later reported that he was followed all the way home from Brighton by a "Flying Saucer." We sympathised and suggested that perhaps it had only been a "Stooplate" after all. "Too big," came the reply, "and it definitely did *not* have any lead out wires!"

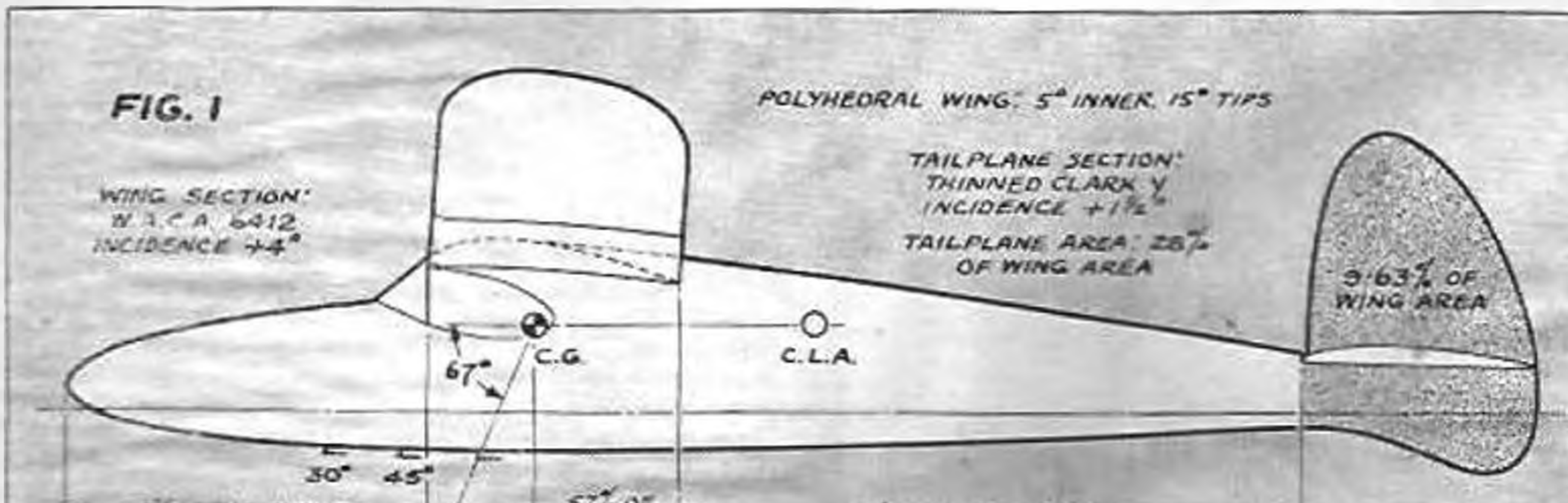
● OUR NEW A-2 glider flies well and we are particularly pleased with the tow-line stability. Judging from what we saw at this year's Surbiton Glider Gala, the model which behaves well on the tow-line is the exception, rather than the rule. Some gliders have to be "played" with almost a fisherman's skill and carefully coaxed into position for release—often at little more than half the height possible with the length of tow-line being used. The reasons for tow-line instability are many and the subject has often provided the technical contributors to model magazines with good meaty material. We make no claim to having hit upon a foolproof solution to the problem, but with this new glider you just heave on the tow-line and the model rockets up until it is overhead and ready for the cast off—all in a matter of seconds. The rear hook is used in all weather conditions and even with the auto-rudder already over, the model still tows almost overhead, with no appreciable "hunting." We confess that the underfin was added for perfect two-line control—although the upper fin was quite sufficient for free flight stability.

Details of the aerodynamic set-up of this design are given in Fig. 1 as they may be of interest and assistance to glider fans. The model has a total (projected) wing and tailplane area of 515 sq. in. Wings are constant chord with elliptical outer tips. The lower fin is half the area of the upper fin. The C.G. and C.L.A. are both on a line parallel with the normal flight attitude—which according to design expert Charles Grant, is an ideal arrangement.

In Brief . . .

● AEROMODELLING RECEIVED a boost over the radio recently, when enthusiasts of the Whitfield Youth club were interviewed in the *On Our Way* programme. . . . T. Wilson, of the Morden and District M.A.C. set up a new club record of 102.63 m.p.h. with the first flight of his new ETA 29 powered speed model . . . Taking up team racing? Get into the swing of repeated landings and take offs, plus three-in-a-circle flying, with that old trainer on which you learnt to fly C/L. These models are tough, easy to repair and perfect for an introduction to team racing.

FIG. 1



Prototypes Worth Modelling

The first of a series featuring old and new types of aircraft which will appeal particularly to flying-scale enthusiasts

By C. B. Maycock

THE Roland "C" two-seater fighter of 1917 lends itself very well as a subject for scale model C/L in that it is a narrow gap biplane with a pronounced stagger. Its general proportions are similar to a deBolt "Bipe" (horrid contraction!) and it can be made just as strong and much more satisfying to look at. A neat engine installation with the necessary access panels could follow the original pretty closely and does not appear to present any great difficulties. The original had a 175 Mercedes, six-cylinder in-line engine, the forward three cylinders only were visible, the others were submerged in the fuselage.

Both wings were identical and had ten equally spaced full ribs. Ailerons with oblique hinge line were in the top planes only and worked by cables led through a fairlead on the bottom planes.

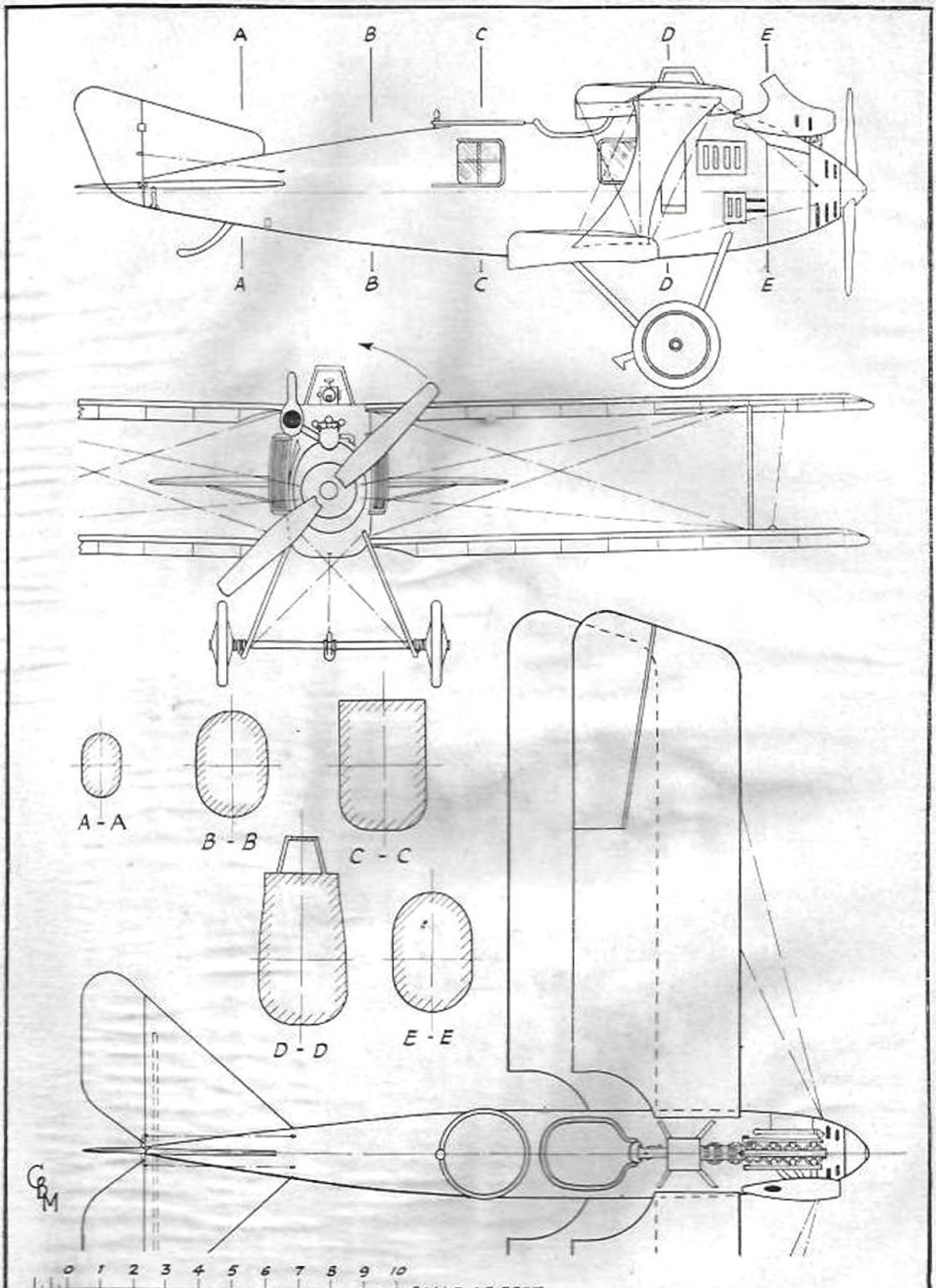
The fuselage was of wooden monocoque construction. The pilot and observer air gunner sat close together and both had transparent panels in the fuselage sides to improve the downwards view. The former had a single Spandau (German Vickers) machine gun mounted on the centre line of the aircraft beneath the four-legged crash-pylon. The latter had the usual German ring mounting with a belt drum fed Parabellum infantry type machine gun.

Ear type radiators were mounted either side of the fuselage and a flush fitting oil radiator in the nose.

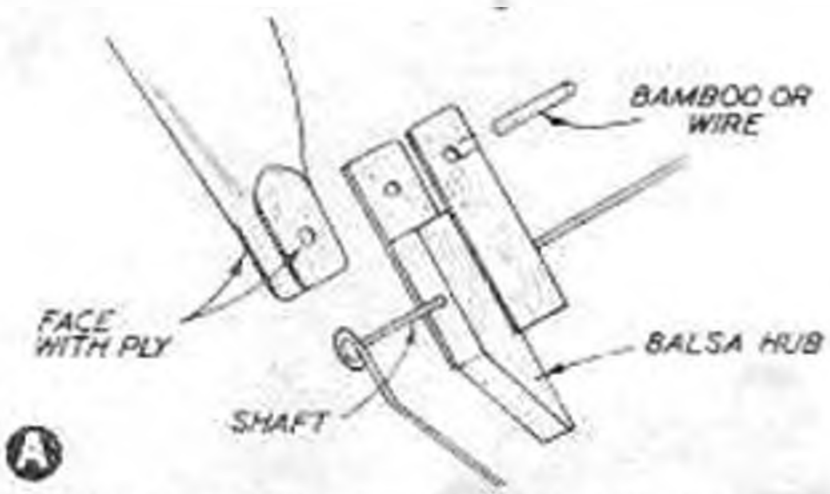
The streamlined exhaust stack is quite an interesting feature. It is for all the world like that old fashioned "musical" instrument the ocarina, if anyone remembers that far back. It was, in effect, an early form of ejector exhaust. Which only goes to show how far in front of the allies the Germans were technically in the '14-18 War.

For those who have read R. H. Kiernan's book on Capt. Albert Ball, Britain's top-line fighter pilot of 1916-17, will recall many references to encounters with Roland two-seaters and it is a typical scene which is envisaged in the drawing and shows Ball creeping up under the Roland's tail and the Jerry "pouring on the coal" in an endeavour to escape.

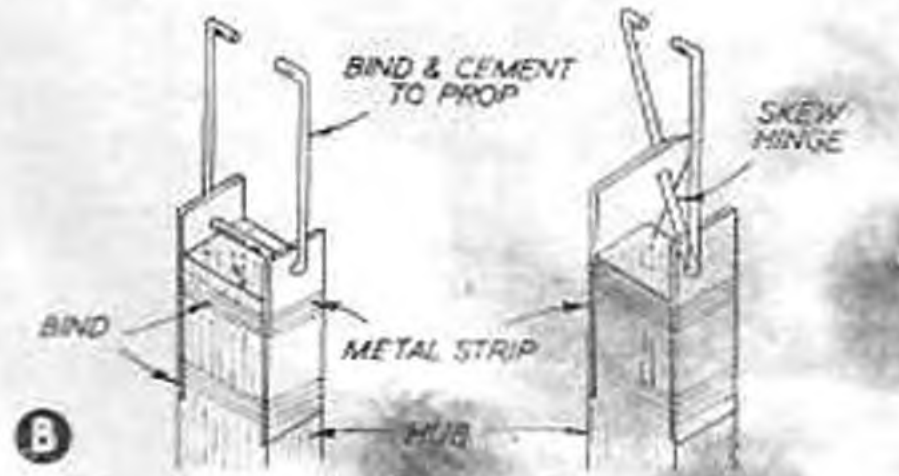
One word of warning about the finish of your model. Don't give it the straight-sided Iron Cross. I know it's easier to paint but it didn't come in until the Roland had gone out of service at the end of 1917. The machine can be either cream all over with red, or other colour belly band. Or a dark greyish green with the cross Patte on a white square panel. The undersurfaces in this case would be either pale blue or grey.



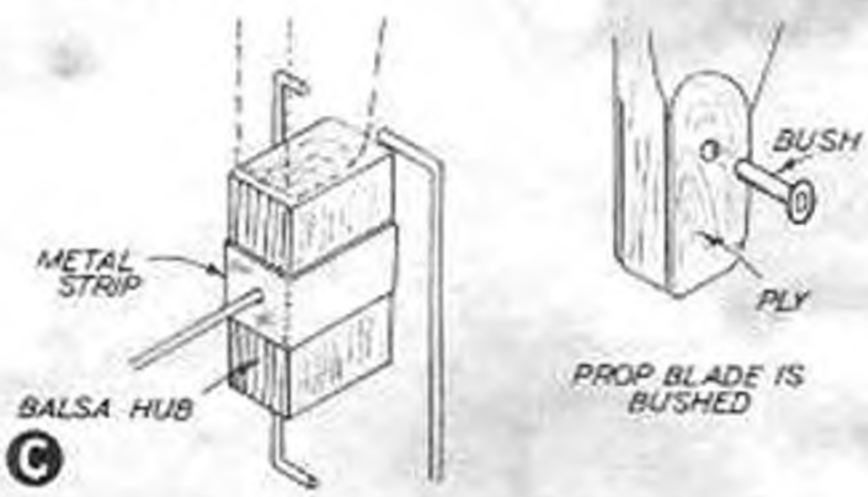
ROLAND "WALFISCHE"



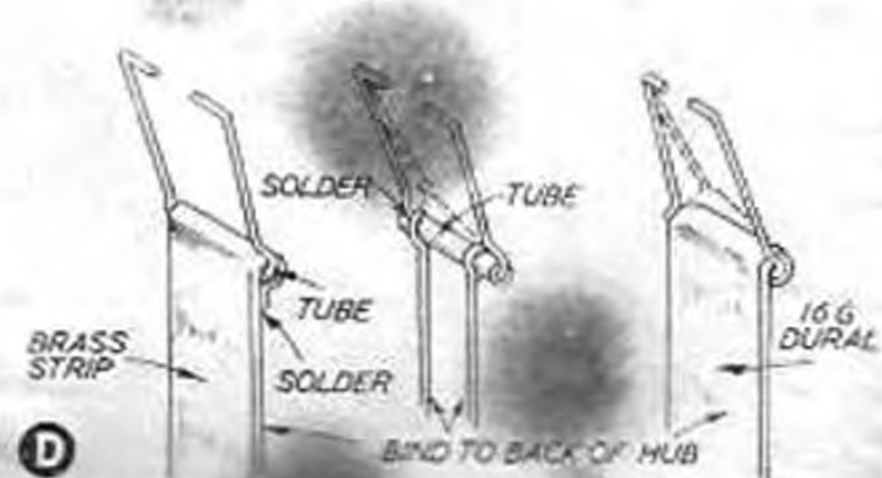
Simple plywood hinge is most popular



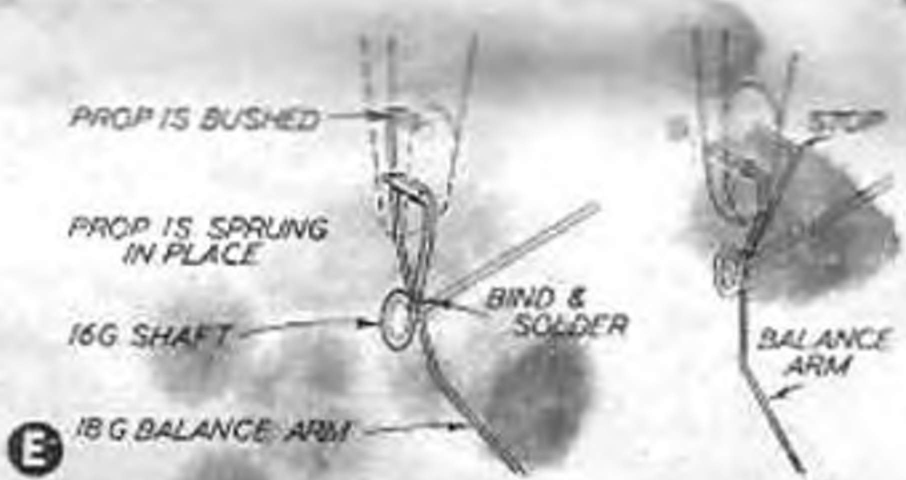
These hinges suitable for light models



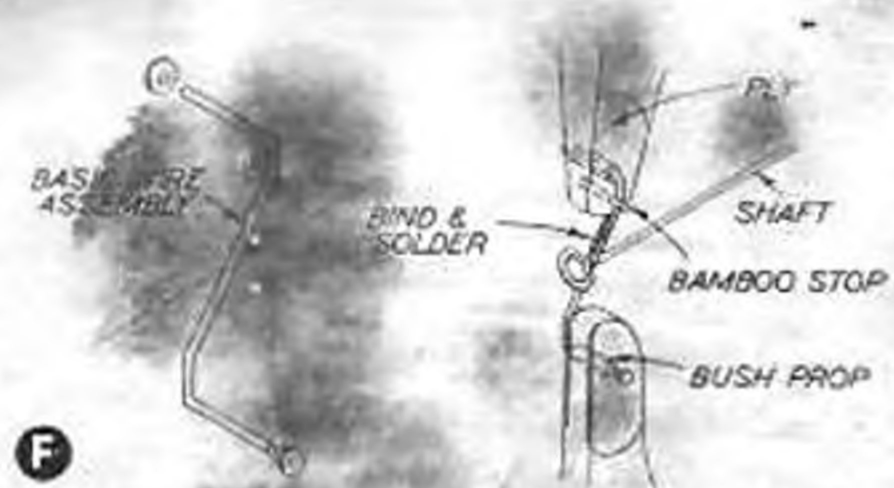
Good for heavy two-bladers.



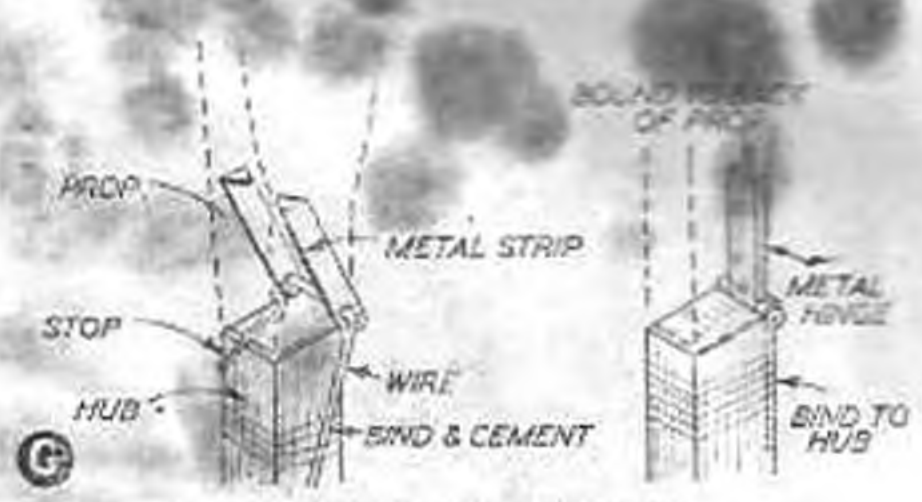
Metal hinges best suited to Wakefields.



Single-blade, all-wire hinge is good.



All wire again. Two-blade prop.



Fittings like this have limited use.

Mechanical motor tensioner is a must.

How to make it

NO. 5. FOLDING PROPELLERS

(**A**) For all small and medium weight models, simple hinges of this type are quite effective and very easy to make. The balsa hub is faced on either side with thin ply—about 1/16 in. thick for preference. Blade roots are a snug fit, the surfaces in contact with the hub fitting also being faced with thin ply. Drill through hub assembly and propeller blade root and use a bamboo or wire peg for the hinge pin. Give sufficient clearance to ensure blade folds smoothly without binding. Shaft is bent to form balance arm. Bind whole hub assembly with thread and cement.

(**B**) Simple metal hinges of this type are popular on American models. Hard brass about 1/32 in. thick is best. Drill to take the wire fitting, assemble on wire and bind and cement securely to the propeller hub. Note that the ends of the wire are turned over. These push into the propeller blade, the whole being then tightly bound with thread and well cemented. To make a neater job, groove the propeller so that the wire lies flush with the surface. This type of hinge can be used to give a skew folding motion to the propeller.

(**C**) This is a heavyweight type which has been used with considerable success on 18 in. diameter two-bladed Wakefield propellers. The centre portion of the balsa hub is bound with a strip of metal—brass or tinplate—which then forms the shaft bearing. Propeller roots are faced with 1 mm. ply and bushed with brass tube to take the hinge wires. Assembly is as follows. Solder one hinge wire to one side of the metal strip around the hub. Mount the propeller blades in place and check for trueness. Then add the second hinge wire, lightly bind in place and solder this to the metal strip. Finally bind the whole hub assembly with thread and coat with cement.

(**D**) Metal hinges of this type have also proved particularly effective on Wakefields. All consists of fittings bound to the back of the hub, with wire arms bound to the propeller blades. Suitable for either single- or two-bladers, but more especially the latter. In this first one, a strip of brass the width of the hub is wrapped around a short length of brass tube at each end and soldered. The wire propeller fitting is retained in this tube. 18 s.w.g. wire is strong enough. Instead of brass strip, 18 s.w.g. wire can be used, wrapped around the end tubes and soldered. Or, if you are good at metal work, use a dural strip and bend accurately around the wire fitting itself.

(**E**) This type of hinge is simple and effective for most lightweight and F.A.I. designs. In the single blade version, two alternatives are possible. The shaft is bent into a winding loop and then carried back and out to form the hinge wire. A second hinge wire of thinner gauge can be bound and soldered to the shaft, its extension forming the balance arm. It is very flexible, and allows blades to be sprung off for replacement. If you use the second wire as a stop only, a retaining washer is necessary on the hinge wire, making blade changing more difficult. Propeller must be bushed.

(**F**) The two-blade all-wire fitting is equally effective. The hinge wire is formed in one piece and then bound and soldered to the shaft. Suitable stops of bamboo or 20 s.w.g. wire can be pushed into the propeller blades, if required. And to retain the blades in position you can solder on washers, or simply add a blob of cement. Incidentally, stops to limit the forward movement of a folding propeller are not strictly necessary. When rotating, centrifugal force will keep the blades out straight. Another advantage of these all-wire hinges is that the propeller pitch can be adjusted readily by bending the hinges, as required.

(**G**) Commercial hinges of this type have been available in America and seem to have given good service. The wire part is bound to the hub this time, and the metal strips to the propeller. The ends of these strips are turned into the wood for a stronger location. Both propeller and hub joints must be securely bound and cemented. An advantage is that this sort of hinge can be fitted to a normal carved propeller and the propeller then cut to turn it into a folder. This makes for greater accuracy with two-bladers. The second commercial type utilises a special metal hinge, but is rather weak. Chief fault is a tendency to twist off.

(**H**) All folders must have a mechanical motor tensioner incorporated on the noseblock. When the motor is wound the stop on the propeller shaft clears the stop on the noseblock. But as the motor runs out and loses its tension the spring takes over, pulling the shaft forwards, engaging the two stops and locking the shaft there. The stops must be located to stop the propeller at the right point. Without skew hinges, a two-blader will need to fold against top left and bottom right sides of the fuselage. Single bladers fold against top left. Use a woodscrew for the noseblock stop, as this permits easy adjustment. And preferably do not use a coil spring tensioner.

S.E. AREA CONTROL-LINE CHAMPIONSHIPS BRIGHTON

1. Team Racing was seen for the first time in this country at the Brighton Meeting and the photograph shows the Bournemouth, Guildford and St. Albans clubs' flyers in action.

2. D. Carnegie of the Canterbury Pilgrims Club, like many other competitors in the speed events, had engine starting trouble.

3. Two West Essex club members, Joe Deniz and Bill Tickner, who seem undaunted by the bad weather conditions.

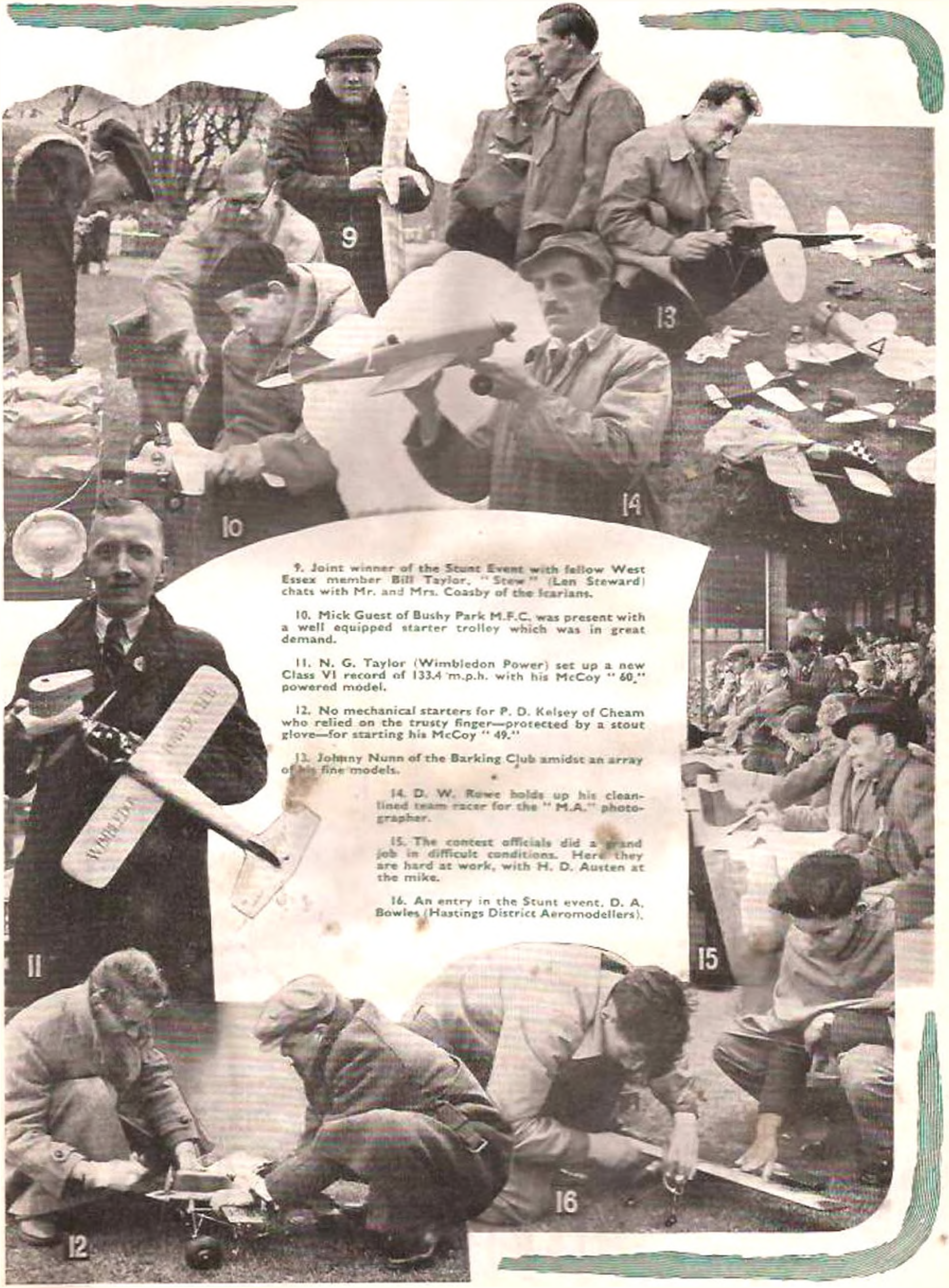
4. Harry Whitney of the St. Albans Club starts up his team racer. He was unlucky to crash his model during a mix-up in the centre of the circle.

5. The line-up for the Scale Stunt Concours. Despite the strong wind many of these models proved to be stable flyers.

6. Winner of the Team Race, Phil Smith of the Bournemouth Club with his Midget Mustang.

7. The fine array of prizes a number of which went begging for lack of entries.

8. Bill Evans of the Weston Controlliners gets one of his McCoy "49" speedsters started up.



9. Joint winner of the Stunt Event with fellow West Essex member Bill Taylor, "Stew" (Len Steward) chats with Mr. and Mrs. Coasby of the Icarians.

10. Mick Guest of Bushy Park M.F.C. was present with a well equipped starter trolley which was in great demand.

11. N. G. Taylor (Wimbledon Power) set up a new Class VI record of 133.4 m.p.h. with his McCoy "60" powered model.

12. No mechanical starters for P. D. Kelsey of Cheam who relied on the trusty finger—protected by a stout glove—for starting his McCoy "49."

13. Johnny Nunn of the Barking Club amidst an array of his fine models.

14. D. W. Rowe holds up his clean-lined team racer for the "M.A." photographer.

15. The contest officials did a grand job in difficult conditions. Here they are hard at work, with H. D. Austen at the mike.

16. An entry in the Stunt event. D. A. Bowles (Hastings District Aeromodellers).

Flying Scale Models

By A. W. Garry

● The writer has built and flown many scale model aircraft, and during the twenty years in which this has been his main interest in model aviation, he has made a study of the various problems connected with them

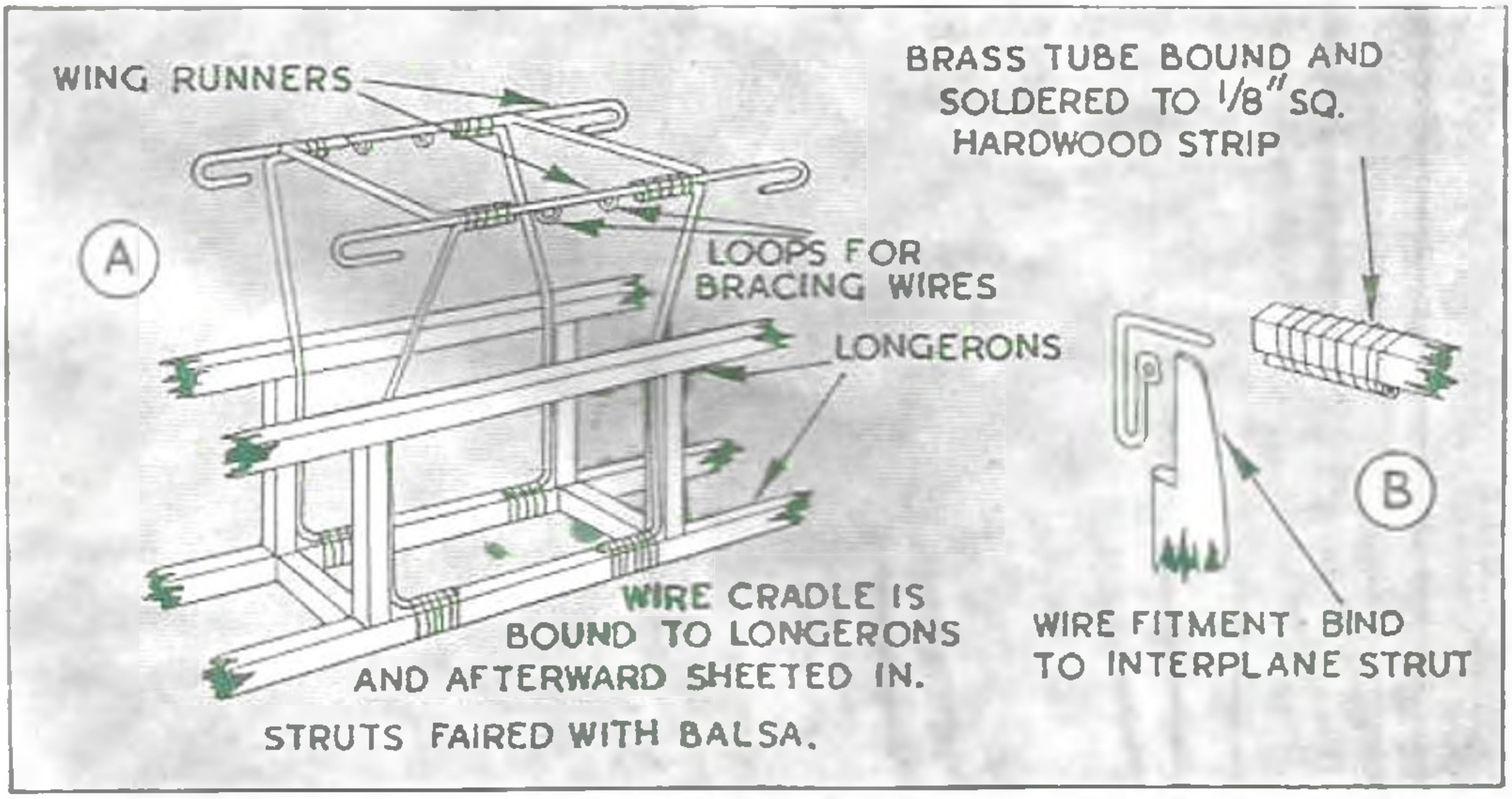
UNTIL the introduction of the miniature compression-ignition engine, the problems imposed by rubber motors and coarse pitch airscrews made the successful flying of scale model aircraft extremely difficult, and criticism of the flying qualities of such models was, to a large extent, justified, for the following reasons.

In most full sized machines, the weight of the engine in the nose makes it necessary to attach the mainplanes well forward, whereas the rubber driven model had its motive power distributed along the length of the fuselage. Consequently, a model dimensioned strictly from a prototype was tail heavy, and ballast had to be added to the nose. Thus, in practice, the rubber driven model, if built to scale, was handicapped from the start by heavy wing loading, a fixed wing position, a coarse pitch airscrew with its attendant torque, and a comparatively brief motor run. These difficulties are, of course, encountered in the conventional " duration " model too, but are much easier of solution, and, in practice, the most successful models were of the high wing type, such as the " Puss Moth," " Leopard Moth," etc., which had a performance approaching that of the " duration " type. Low wing monoplanes and biplanes were also built with a fair performance but were generally much more difficult to trim and fly for any length of time than the high wing monoplane. In addition, biplanes had to be very lightly built, and therefore were more fragile and liable to sustain damage. All these limitations the enthusiast was prepared to endure, but, like the writer, he must often have yearned for a constant-thrust miniature engine without the many drawbacks of the rubber motor.

Although the miniature two-stroke petrol engine disposed of most of these difficulties, the combined weight of batteries, coils and condensers, essential to these i.c. engines, continued to raise the question of heavy wing loading, and it was not until the introduction of the compact, self-contained compression-ignition " diesel " that flying scale model aircraft at last came into their own, so that now it is possible to follow full-sized practice in their design and construction.

It only remains for the experienced aeromodeller to choose a suitable prototype of the high wing monoplane, or biplane type to scale it down to suitable dimensions, and to incorporate details making it inherently stable. Provided, as stated above, that a suitable prototype is chosen, these requirements can be met and fulfilled, and it is the purpose of this article to show how.

The flying scale enthusiast is primarily a " sports " flier, and not interested in competition work. It is his ambition to build a successful flying scale model



but trim is critical, and unless such devices as pendulum-controlled rudders and ailerons are incorporated, they tend to be hopelessly unstable.

Constructional Details and Hints

We now come to the building methods which I have found most practicable. Let us assume that we have decided to build a scale biplane. To begin with, we will discuss the mainplanes, and the writer's method of assembly and bracing. I always make the top wing fully cantilever and in one unit, even though this may make transport more difficult. The top mainplane takes the weight of the lower planes via the interplane struts, so that the dihedral angle joints must be suitably strengthened and reinforced by plywood " keepers." There is no reason why the top mainplane should not be made in halves if the builder so prefers, but in that case use the dowel and tube method of joining the separate wing rather than the box and tongue method.

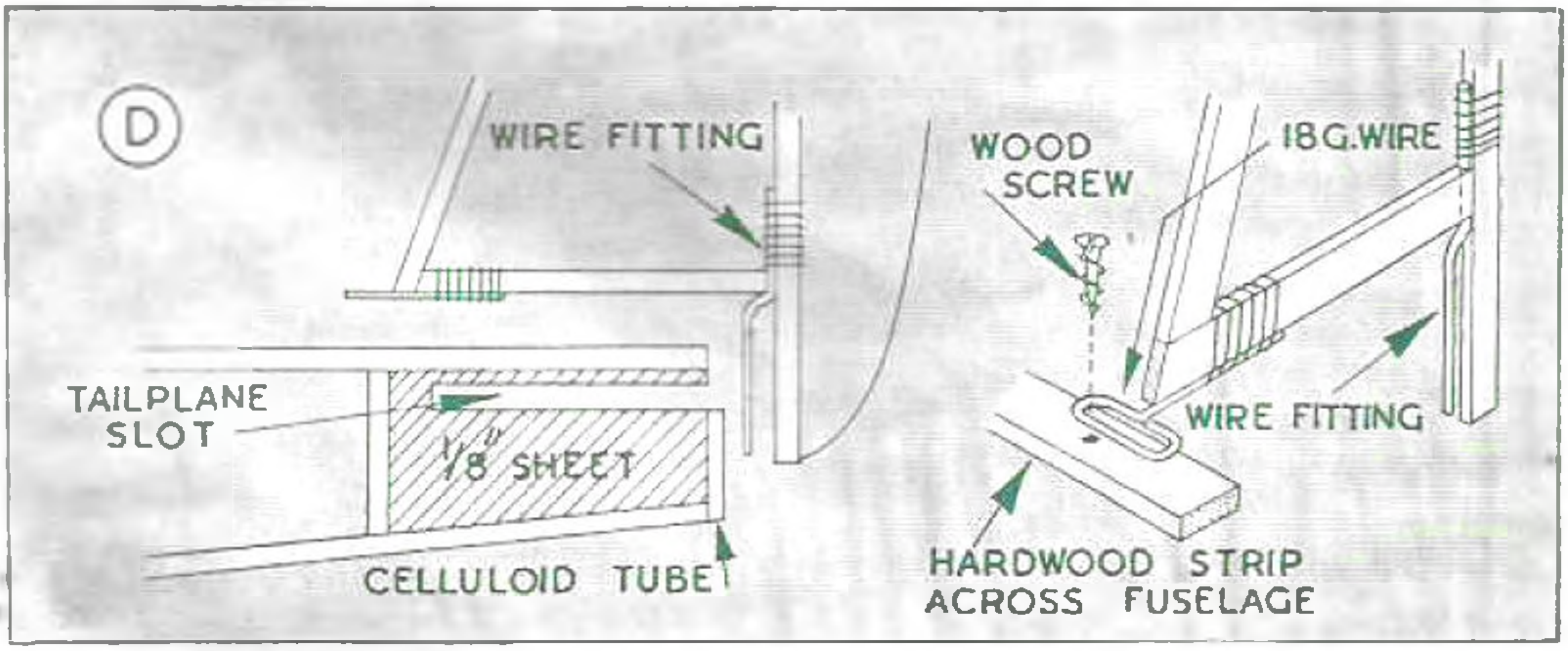
The top wing rests upon a wire cradle, which forms the centre-section struts (see sketch A) and is held in place by two stout elastic bands. If of the same colour as the doped covering, these will not be unduly noticeable, but the builder may elaborate by passing the bands through paper tubes running from leading to trailing edge, inside the wing. The root ribs of the lower wing panels have wire hooks projecting from each main spar. These hooks enter paper tubes cemented across the fuselage, and are held together by elastic bands. The interplane struts are made from 3/32 in. by 1/6 in. or 1/8 in. by 1/4 in. obechi strip (according to the size of the model) sanded to streamline shape, and have the wire strut fixing bound and cemented to each end (see Sketch B). Half-inch lengths of brass tube of a gauge to fit the wire strut fitting, are attached to lengths of 1/8 in. hardwood strip, bound with fuse wire and soldered. The interplane struts are then slipped into the brass tubes which join the wings together, and the assembly is finally braced with strong linen thread as shown in sketch C. This method of wing assembly makes a unit which is rigid in flight, yet capable of flexing under shock or in the event of the machine striking an obstacle during take-off or landing. Incidentally, the writer always employs the old favourite " Clark Y " section for wing ribs, which makes for strength and ease of construction. It is, without a doubt, the most efficient type for the slow flying model. Tail-plain and fin are always built with a non-lifting rib section, and are attached as shown in sketch E. The rear legs are made from soft strip leather, held in tension by the forward pull of the front legs, but capable of folding when the chassis is driven back under a heavy landing shock. The shock-absorbing elastic bands should be so adjusted that the backward movement is limited, otherwise you will find that an extra heavy landing will drive the wheels upwards into the lower mainplane.

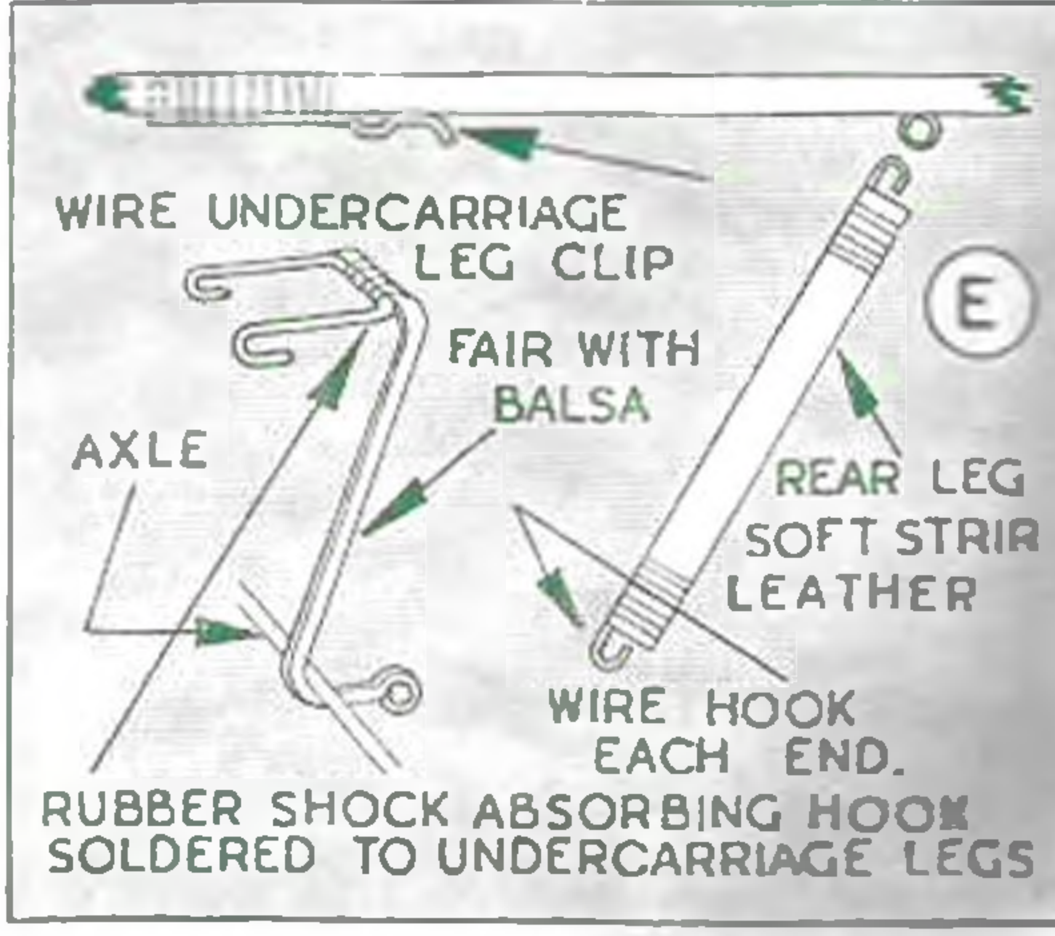
The motor is bolted to a separate bulkhead which is attached to the main bulkhead by wood screws, so that should more side or down thrust than that originally estimated be found necessary, it may be added during trimming trials by means of hardwood slivers between the two bulkheads. These may afterwards be built into the fuselage. Incidentally, I always cover the fuselage with sheet balsa as far back as the rear of the mainplane.

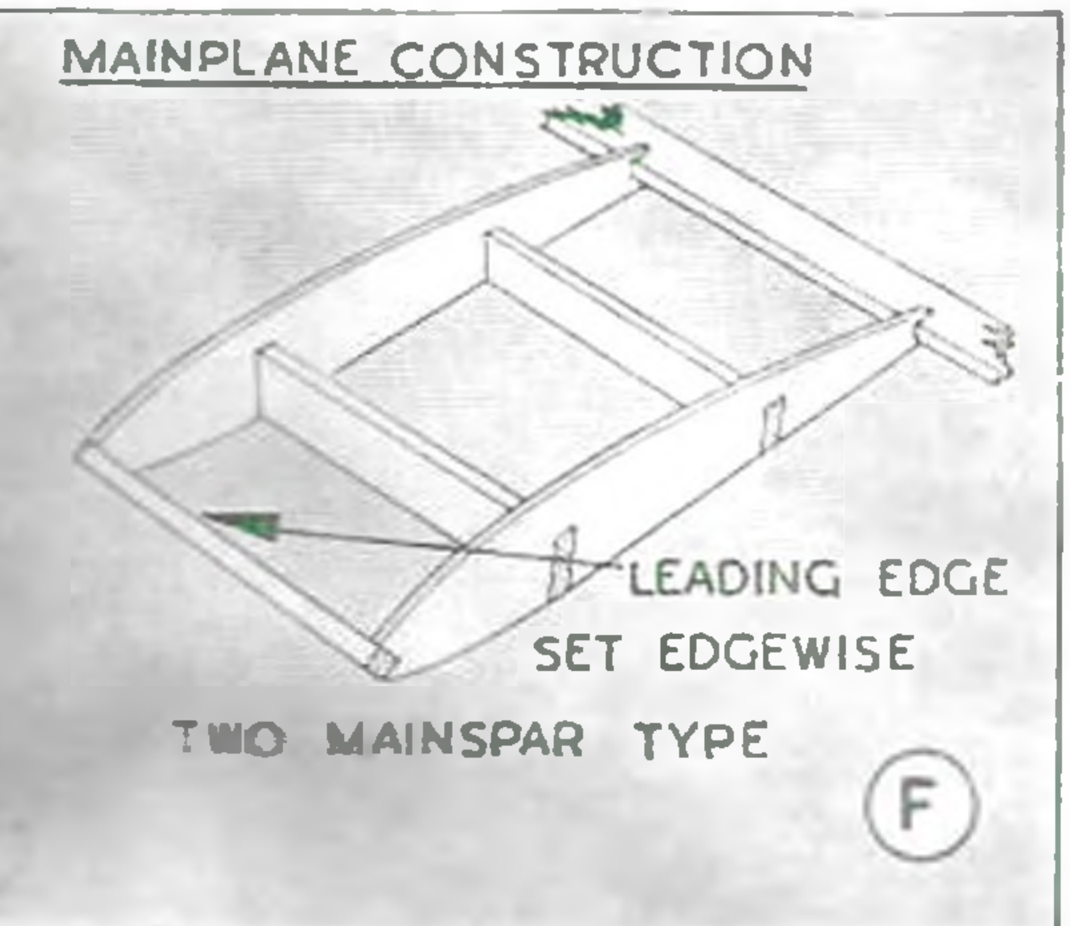
Monoplanes of the high wing strut-braced type may be assembled as in sketch E. Do not omit to incorporate the wire brace across the fuselage, or you will probably find that a hard knock on either wing panel will tear the longeron away.

Tail Surface Dimensions

The writer always avoids scaling down a prototype having a short moment arm, i.e., a short stubby fuselage. Unless the tail areas are considerably enlarged over scale size, such a machine would be very unstable longitudinally. In designing a flying scale model, the writer slightly increases the tail areas as a safety precaution, bearing in mind the need for stability. In round figures, when designing a 1/2 in. scale model, I add 1 in. to the span and 1/2 in. to the chord of the tailplane, over and above the







scaled down dimension. This slight increase in tail area in no way detracts from scale appearance and gives a margin of safety.

Material Specifications

The following are dimensions of materials used in the construction of the airframe.

A. 1 in. to 1 ft. scale models (0.75-0.87 c.c. diesels).

Longerons cross struts 1/8 in. plywood, other formers 3/32 in. sheet balsa.

Wings. Leading edge 3/8 in. hard balsa. Main spars 1/4 in. by 1/8 in. hard.

Trailing edge 1/4 in. by 1/4 in. hard balsa. Main end strut ribs 1/8 in. balsa, others 1/16 in. wire for centre section struts, and 18 g. for wing attachment runners. The front undercarriage legs are also bent from 16 g. piano wire.

B. 1/8 in. scale models (1 c.c. diesel motor).

Longerons, cross strips 3/16 in. sq. hard balsa.

Main bulkheads 3/16 in. ply, other formers from 1/8 in. sheet. Leading edge 3/16 in. sq. hard, main spars 3/8 in. by 1/8 in. hard, and also for trailing edge. Tail surfaces from 1/8 in. sq. leading edge, and 1/4 in. by 1/8 in. trailing edge—ribs 1/16 in. balsa, main ribs 1/8 in. balsa. Centre section strut assembly and undercarriage bent from 16 g. wire.

Rigging Incidences and Dihedral Angles

I always allow 1/8 in. positive incidence of the mainplane in the case of a scale monoplane, and a dihedral angle of 3/4 in. rise per foot of wing span. In the case of a biplane, I rig the upper wing at a larger angle of incidence than the lower. In actual figures, allow 1/16 in. positive incidence on the lower mainplane, and 1/8 in. on the upper. Dihedral, 1 in. per foot of span. The tailplane of the non-lifting type should be either at zero incidence, or positive incidence not exceeding 3/32 in. These are good figures to use when designing your model and machines incorporating them should not be difficult to trim, any final adjustment being made by the addition of small amounts of plasticine either to the nose or the tail. Should ballast be found necessary, the plasticine is replaced when trimming with lead. In the majority of machines very little ballast should be necessary.

Finally, if possible, install the motor in an inverted position. The low underslung weight, greatly contributes to stability.

Trimming and Flying

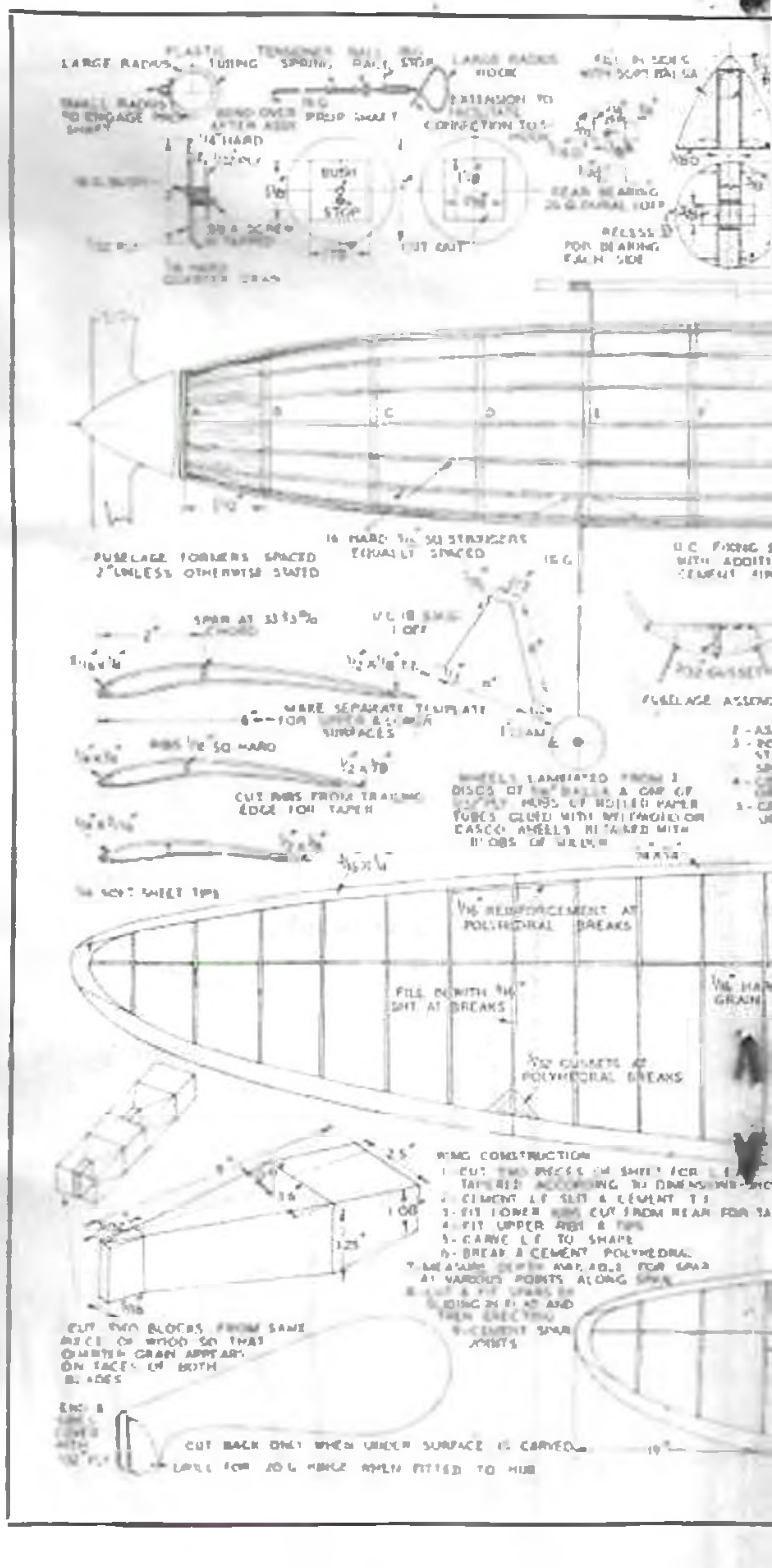
Always choose a flat calm for initial tests; it is impossible to trim a slow flying scale model except under these conditions. I prefer to commence operations by test gliding over long grass, and not until I have secured the best possible glide do I commence power tests. Commence with the tailplane at zero incidence, and note glide path. Should machine glide steeply, gradually increase tailplane incidence. Do not exceed 3/32 in. positive incidence but make any final adjustment with ballast. When satisfied, commence power tests with the engine running at the least possible revolutions. Note carefully any tendency to turn under torque, and counteract by offsetting the fin. Do not exceed a total movement of 1/16 in. offset, or the machine may spin on the glide. Correct for torque by increasing side thrust, until when under full power the machine climbs in slow left hand circles.

Should the machine stall under power, increase the downthrust until it climbs steadily at a flat angle. Altering the tail incidence to correct stalling will affect the glide. If the machine glides well but will not climb, decrease or remove the downthrust. Always fly your model with sufficient power to give a steady climb. It should not be necessary, however, to use full power to obtain satisfactory flight.

A final tip:—Don't fly scale models in more than a very light breeze, or you stand a good chance of losing them, if they are of the light wing loading type. For the same reason, limit your motor run. The writer prefers to do this by carefully metering the amount of the fuel in the tank and does not rely on timing devices.

TORPEDO

By J. R. North



THIS model is the result of experiments in streamlining which I have been making since 1937, and, as you will see from the plan, the layout differs from that favoured by Copland, Bullock, Chasteneuf and others of that school in that it employs a folding propeller, a lower aspect ratio, elliptical surfaces, a high wing position and a thin, highly cambered aerofoil. A further difference, not evident from the drawing, is that the model is intended to climb fast and high in order to make full use of its exceptional glide. The stability of the design is excellent, showing none of the vices supposedly inherent in streamlined models.

The pre-war versions all had free-wheeling propellers and were relatively light except for the 1939 Wakefield model. After the war I made the *Torpedo*, a 1946 Wakefield model, and a F.A.I. job with a slimmer fuselage; all with folding propellers. So I have no hesitation in saying that the design has been well tested and the theories on which it was based are well-founded.

Fuselage

The construction of streamlined fuselages has been well covered in the past and there are ample notes on the plan to assist the constructor. It is therefore, only necessary to say that this one is conventional and merely requires care in lining-up the stringers; the selection of good wood to start with, being half the battle. In making the formers

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

BEE-BUG

Designer Phil Smith has never been reluctant to introduce " full-size " features, as witness the flaps incorporated on the Veron flying scale C/L series.

The *Bee-Bug* has another of these little " tricks "—an aerodynamically balanced elevator. That part of the elevator forward of the hinge is subjected to a force, immediately it is displaced, tending to make movement of the whole elevators easier and lighter.

VANFIRE

One look, and any C/L fan will know that J. R. Vanderbeek designed this model which is specifically intended for the Frog 500. It is fully—and safely—aerobatic on 70 ft. lines, with a normal level speed of between 70 and 80 m.p.h. depending upon the propeller used.

Novel feature of the construction is the fact that the wings are built as separate halves, joined to the fuselage with a tongue and box fitting. This lessens the risk of damage in a crash landing—and we know for a fact that this model is certainly tough!

MUSKETEER

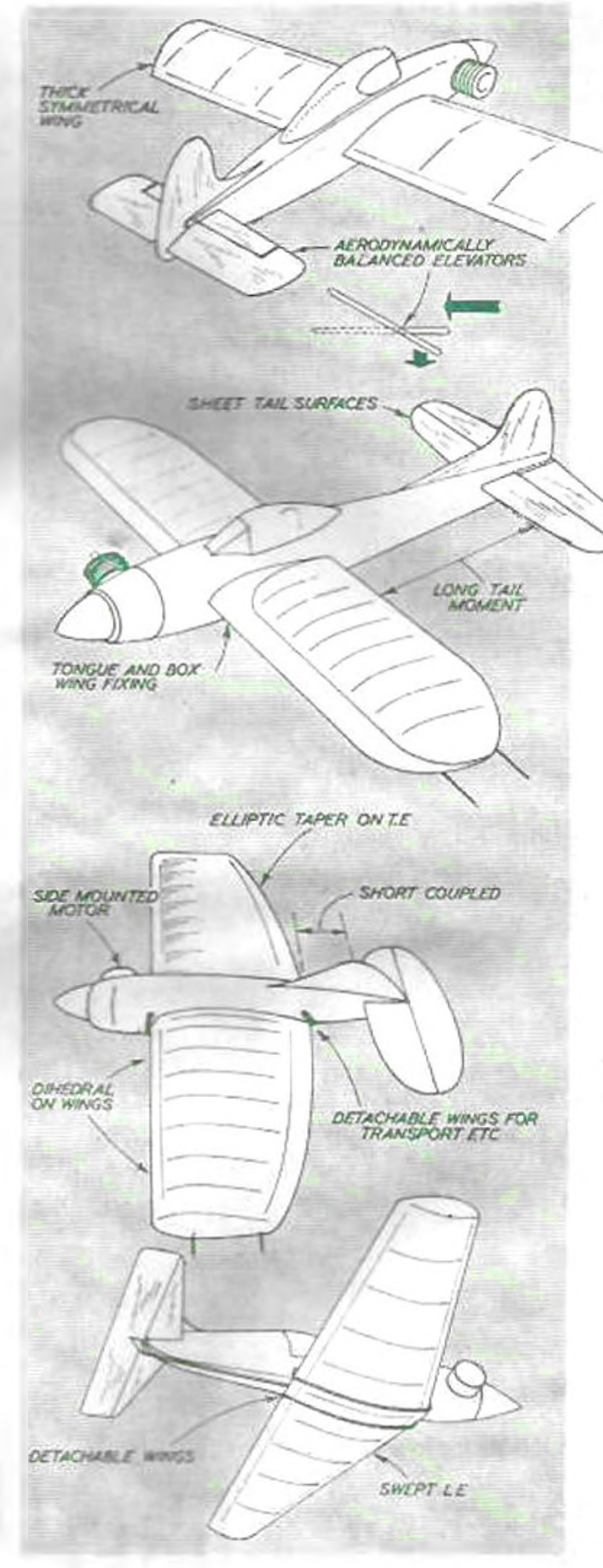
The Mercury range of short-coupled stunt C/L designs is already well known and the new Henry J. Nicholls *Musketeer* design follows the same layout. A lot of area is concentrated in a moderately low aspect ratio wing, with all the taper on the trailing edge. The tailplane is then located less than half a chord length from the wing trailing edge—a set-up making for extreme ease of manoeuvrability, without the tendency to mush or stall following a sharp pull-out.

This model, too, is proportioned to suit the Frog " 500 "—or other similar motors, like the Yulon 29. Speed similar to the *Vanfire*. The wing is detachable.

SKYSTREAK

This model really started out as a tailless design! The prototype tailless flew very smoothly, and would stunt well. But it had one major fault. It was too stable! Hence designer Bill Dean had some further thoughts on the subject, ending up with a somewhat similar configuration, but with a conventional tail unit. The whole design was modelled on modern jet fighter lines, with swept-back wing, tail and fin entries.

The *Skystreak* is now available in two versions. The smaller " 26 " was developed around the E-D Bee, but remains fully aerobatic on most other motors of similar size. Both versions feature detachable wings.



STUNT CONTROL LINE KITS

The following tables have been compiled to include all current stock and production kit models, as up to April, 1950. Whilst every effort has been made to ensure that these tables are as complete as possible we can take no responsibility for any errors or omissions. Allocation into the two main groups—*Stunt* and *Sport*—has been based on our own estimates of performance. The fact that a particular design is included in the "Sport" category does not necessarily mean that it is not stuntable, but rather that the model has been designed for sport flying rather than pure aerobatics. We should also like to point out that no flying scale models are included. These will be the subject of a later survey.

Whilst every care has been taken to make these tables as complete as possible, up to March, 1950, no responsibility can be taken for omissions or errors contained therein.

Span	Kit	Price	Manufacturer	Type	Max. Line Length	Suitable Motors (Design motors in heavy type)
20	COMET	11/6	British Model Aircraft ...	Low Wing	—	**E.D. Bee**, Mills II, Frog 100-160, 180, etc.
22	BEE BUG	11/6	Model Aircraft (Bournemouth)	Semi-scale	—	**E.D. Bee**, Mills .75, Amco .57, Mills II, etc.
24	STUNTER	19/6	" " "	Biplane	45-50 ft.	**Mills II**, Javelin, Frog 160, etc.
24	AEROBAT	10/6	Super Screw	Low Wing	—	0.75 c.c.-1.8 c.c.
24	SWIFT	25/-	Airyda	Biplane	—	**Elfin 1.8**, Frog 160, Javelin, etc.
25	DRAGONFLY ...	23/6	Premier	Biplane	70 ft.	**Eta 29**, Elfin 2.4, E.D. III, E.D. IV, Amco 3.5.
26	DE BOLT S-BIPE ...	29/6	Mercury	Biplane	70 ft.	Eta 29, E.D. IV, Yulon, Frog, etc.
26	VANDIVER	12/6	International Model Aircraft	Mid-Wing S/S	55 ft.	**Frog 100**, 150, Elfin 1.8, etc.
26	SKYSTREAK "76"	9/6*	Keil	Low Wing S/S	—	**E.D. Bee**, Amco .57, Mills .75, etc.
26	NIFTY	12/6	Don Models	Low Wing	—	**E.D. Comp**, Elfin 1.8, Elfin 2.4, etc.
26	MARLIN MITE ...	14/6	Mercury	Low Wing S/S	—	**E.D. Bee**, Amco .87, Mills .75
28	DERUSH	19/6	Shaws Model Aircraft ...	Semi-Scale	55 ft.	**Mills II**, Elfin 1.8, Frog 160, Javelin, etc.
28	SOUTHERN STOOGE	18/6	Southern Junior Aircraft ...	Low Wing	55 ft.	**Mills II**, Elfin 1.8, Frog 100, Javelin, etc.
28½	SUPALUPA	25/-	Aeromodels	Pod & Boom	—	**E.D. Comp**, Elfin 1.8, Elfin 2.4, etc.
29	KAN DOO	25/-	Kan Doo Products	Profile	55 ft.	**E.D. Comp**, Elfin 2.4, Mills 2.4, etc.
30	STUNTMASTER ...	19/6	Keil	Profile	60 ft.	**Mills II**, All 1.5, 3.5 c.c.
30	JNR. MONITOR ...	14/6	Mercury	L/W Short Coupled ...	60 ft.	**Elfin 2.49**, etc.
30	WILDCAT	30/-	Davis-Charlton	Low Wing	—	**Wildcat**, Frog 500, E.D. IV, Eta 29, Yulon
30	PLAYBOY	17/6	Shaws Model Aircraft ...	Mid Wing	55 ft.	**Mills II**, Elfin 1.5, Javelin Arrow etc.
31	SKYLARK	17/6	Roadway Models	Mid Wing	70 ft.	**Elfin 1.8** up to Amco 3.5.
32	MILLS BOMB II ...	18/6	Halfax	Low Wing	55 ft.	**Mills II**, Elfin, Javelin, etc.
32	MARLIN	19/6	Mercury	L/W Semi-Scale ...	60 ft.	**Elfin 1.8**, Frog 160, Elfin 2.9, etc.
36	BABET	25/-	Super Screw	Low Wing S/S	—	**Amco 3.5**, E.D. IV, Eta 19, etc.
37½	STUNT KING ...	18/6	Keil	High Wing	70 ft.	**Yulon**, Frog 500, Eta 29.
38	MONITOR	27/6	Mercury	L/W Short Coupled ...	70 ft.	**Amco 3.5**, E.D. IV, Yulon, Eta 29, Frog 500.
40	VANFIRE	—	International Model Aircraft	Mid Wing S/S	70 ft.	**Frog 500**, Yulon 29, E.D. IV, Eta 29.
40	SKYSTREAK "40"	10/6*	Keil	Low Wing S/S	70 ft.	**Frog 500**, Yulon, Eta 29.
40	MUSKETEER ...	19/6	Mercury	L/W Short Coupled ...	70 ft.	**Frog 500**, Yulon, Eta 29.

* Dry kit. † Basic kit.

SPORT CONTROL LINE KITS

Span	Kit	Price	Manufacturer	Type	Max. Line Length	Suitable Motors (Design motor in heavy type)
—	SHUFTI	10/6	Astral	—	—	0.75-1.5 c.c.
16	PHANTOM MITE ...	11/6	Keil	Low Wing S/S	35 ft.	**Amco .87**, 0.75-1.5 c.c.
17	NIPPER	9/6	Model Aircraft (Bournemouth)	Low Wing S/S	35 ft.	**Amco .87**, 0-75-1.5 c.c.
18	NANCY	14/6	J's	High Wing	—	**Mills II**, 1-2 c.c.
18	NANCY BIPLANE ...	15/6	J's	Biplane	—	1.2 c.c.
18	SWALLOW	12/-	Airyda	—	—	1-2 c.c.
18	PUSHER PUP ...	19/6	Don Models	Pusher	—	**Amco .57**, 0.75-2 c.c.
18	NIPPER	13/6	Roadway Models	—	—	1-2.5 c.c.
20	SCOUT	22/6	Keil	Biplane	35 ft.	**Mills II**, 1-2 c.c.
21	PHANTOM	18/6	Keil	Low Wing S/S	35 ft.	**Mills II**, 1-2.5 c.c.
22	RADIUS	17/6	International Model Aircraft	Mid Wing	—	**Frog 100**, 1-2.5 c.c.
—	WIZARD	17/6	Shaws Model Aircraft ...	High Wing	45 ft.	**Mills II**, 1-2.5 c.c.
22	RIVAL	10/6	Don Models	High Wing	—	**Mills II**, 1-2.5 c.c.
—	SWIFT	25/-	—	Biplane	—	**E.D. Comp**, 1.5-2.5 c.c.
22	MINX	25/-	Normans	Low Wing S/S	—	**E.D. Comp**, 1.5-2.5 c.c.
23½	RINGMASTER ...	25/-	Royles	Biplane	—	**E.D. Comp.**, 1.5-2.5 c.c.
—	GOBLIN	15/-	Shaws Model Aircraft ...	Shoulder Wing ...	45 ft.	**Mills II**, 1.0-2.5 c.c.
24	SPEEDEE	17/6	Model Aircraft (Bournemouth)	Twin Boom Pusher ...	45 ft.	**Mills II**, 1.0-2.5 c.c.
26½	MONARCH	17/6	Wurcraft	Low Wing S/S	45 ft.	**E.D. Comp**, 1.8-3.0 c.c.
26½	MAGNETTE	25/-	Mercury	Mid-Wing S/S	45 ft.	**E.D. Comp**, 1.8-3.0 c.c.
29	TRAINER	20/-	Halfax	Shoulder Wing ...	45 ft.	**E.D. Comp**, 2-3.5 c.c.
30	JINKER	1	Watkins	Low Wing	45 ft.	**Mills II**, 1.5-2.5 c.c.
30	THUNDERBIRD ...	22/6	British Model Aircraft ...	Mid Wing	—	**E.D. Comp**, 1.5-3.5 c.c.
33	ANITA	19/6	J's	Flying Wing	50 ft.	**Elfin 1.8**, 1.8-3.5 c.c.
34	FLYING WING ...	25/-	British Model Aircraft ...	Flying Wing	—	2-3.5 c.c.
45	GOSHAWK	79/6	Model Aircraft (Bournemouth)	Low Wing S/S	70 ft.	5-10 c.c.

† Plan pack.

M.A. Engine Tests

No. 12—THE NORDEC-SPECIAL ENGINES SERIES I & II

HAVING previously tested both the original 10 c.c. Nordec models, the R.10 spark-ignition and the R.G.10 glow-plug versions, it was with considerable interest that the writer undertook the testing of the new Nordec-Special when it first appeared towards the end of 1949.

The general construction of the new model remains unchanged from that of the standard Nordec, the improvements being confined mainly to the design of the combustion-chamber, and the only outward modifications appear in the new black cylinder-head with its inclined plug. The interior shape of the head is contoured to suit the new piston, which now follows the highly domed deflector pattern used by many of the leading racing engines, in place of the original, almost hemispherical, chamber of the earlier models. Supplementary air induction to the crankcase has been substantially increased by deepening the piston skirt clearance above the lower edge of the exhaust ports at T.D.C.

Carburettor and rotary-valve design remain the same, as do port areas and transfer-passage volume and it is therefore possible to convert the standard Nordec engines quite simply to "Special" specification. A conversion kit, containing the new head, piston and gudgeon-pin is, in fact, available to Nordec owners at £2 14s. 6d.

The engine submitted for test was actually a spark-ignition model and it should be mentioned that it has been found, on previous tests on Nordec engines, that spark ignition does give a greater output than glow-plug with this particular make. However, for present day speed work, battery and coil ignition is almost universally "out"—at least, as far as model aircraft enthusiasts are concerned—and glow-plug operation was, therefore, used for this test. The glow-plug version of the Special differs only in not being equipped with a contact-breaker assembly and in being without the cam-follower slot in the crankshaft housing. It was only necessary, therefore, to remove the contact-breaker and sparking plug and to fit a K.L.G. Miniglow plug, to convert the engine to glow-plug ignition.

The Nordec-Special is built by the North Downs Engineering Company, of Whyteleafe and Caterham, Surrey, and is, of course, mainly intended for fast C/L aircraft and also for model boats and cars.

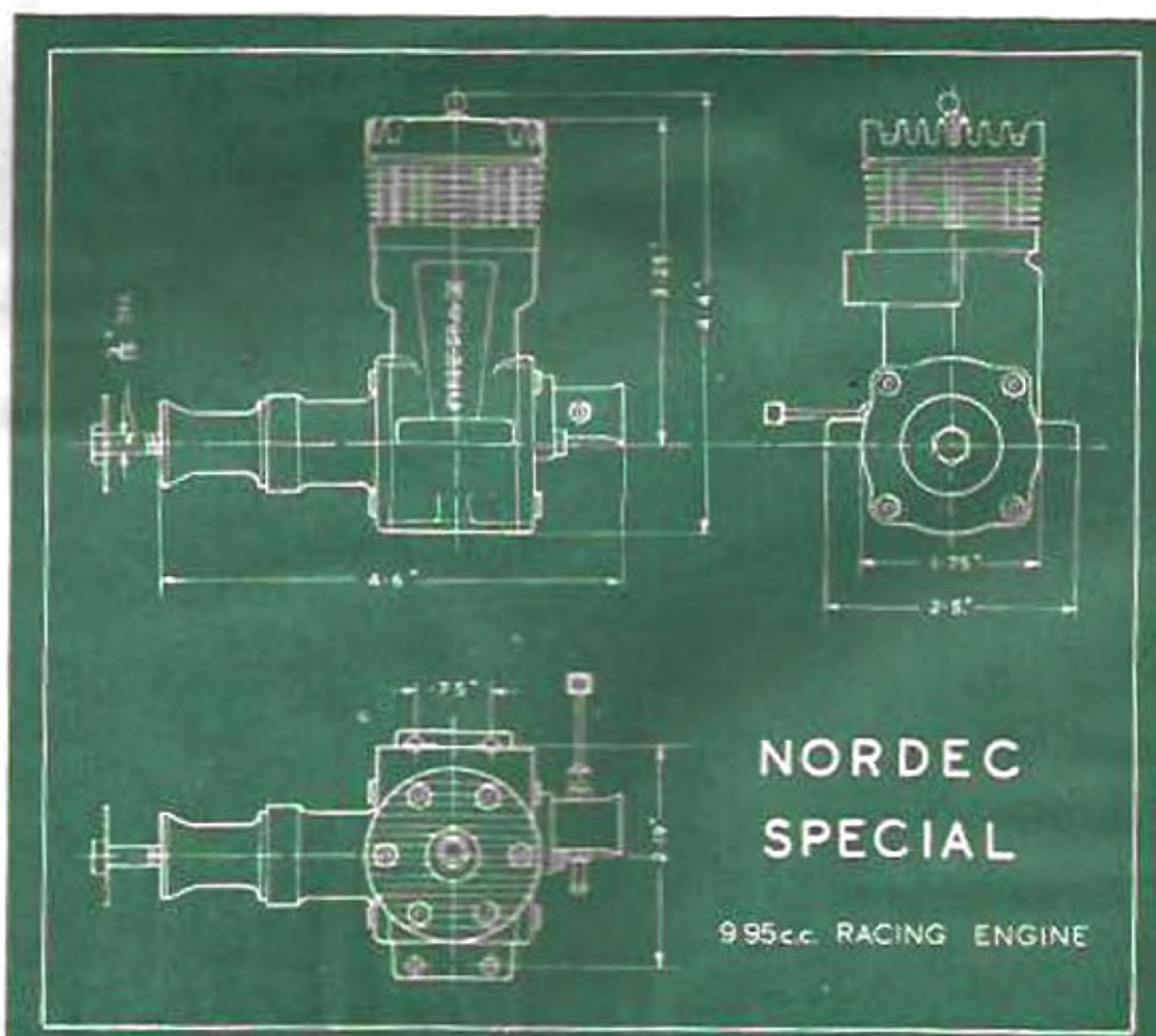
Specification

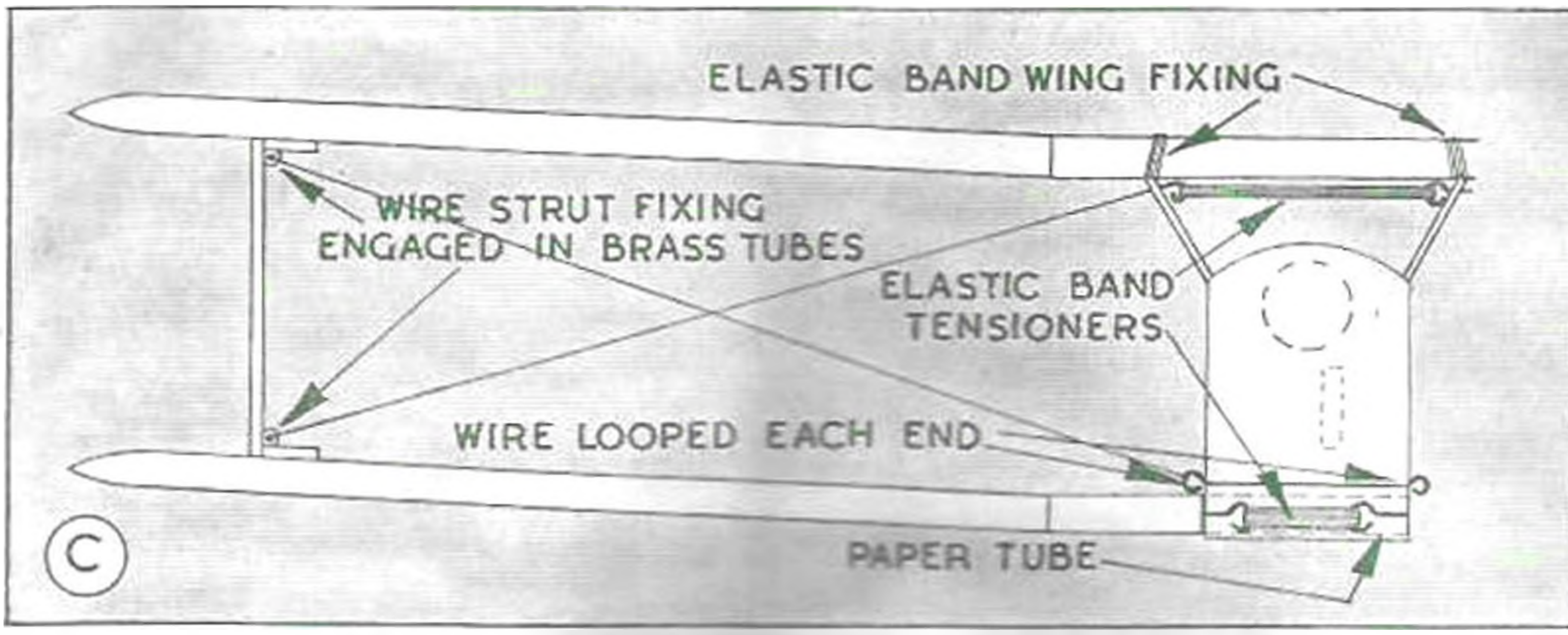
Type: Single-cylinder, air-cooled, two-cycle. Spark or glow-plug ignition. Induction by disc type rotary-valve driven by crankpin. 180 deg. exhaust porting. Baffle piston allowing supplementary air induction. Inclined ignition plug.

Swept volume: 9.95 c.c. (0.607 cu. in.) Bore: 0.940 in. Stroke 0.875 in.

Compression ratio: 10 : 1 (approx.). Stroke/bore ratio: 0.93 : 1.

Timing: Rotary-valve opens 120 deg. before





of a full-size machine either because of its historical interest or beauty of line, or because he has had personal experience of the prototype; and this brings me, first of all, to a selection of those suitable for power-driven flight.

As in the case of rubber-propelled models, the high wing "inline" engined type is the most successful and easiest to trim and fly. Contrary, though, to general belief, the biplane is an excellent scale model flier; the large wing area available makes it a very slow and steady model, and its low gliding and landing speeds render it much less liable to damage in a heavy landing than the monoplane.

Finally, we come to low wing monoplanes. There are a few machines in this category which make successful flying scale models, such as the "Klemm," but, generally speaking, such models are more for the expert, and it is possible to obtain stable flight only at the expense of scale appearance. Dihedral has to be much increased to obtain lateral stability, and, in effect, this reduces the wing area and increases the flying speed, gliding angle and landing speed. It has been my experience with rubber driven low wing models that they are always flying on the verge of instability and have little safety margin to combat eventualities such as gusts, or, in the case of power models, fluctuations of engine speed. So, until you have acquired scale model flying experience, leave the low wing monoplane to the expert.

Engine Size and Scale Dimensions

Coming now to the choice of a suitable scale for power driven models, let us first deal with the available engines. The popular 0.75 or 0.87 "diesel" should be employed in models built to a scale of 1 in. to 1 ft. This gives an average wing span, in the case of monoplanes, of 40 in. and in biplanes, 30 in. to 36 in. Such machines can be excellent performers, but are apt to be fast, and the writer's personal preference is for models built to a scale of one-eighth full size, powered with the "sports" type 1 c.c. diesel motor, such as the E.D. "Bee," the Frog "100" or the Mills 1.3 c.c. Strange as it may seem, it should be emphasised that the flying scale model should be underpowered rather than overpowered. One must bear in mind the effect of the slipstream from a power-driven airscrew, on the tail surfaces; obviously, the more powerful the motor, the greater the velocity of the slipstream and the more critical the effect on the stabilisers. It is safer to ensure that the motor is just powerful enough to give a slow, steady "scale" climb. After all, no scale model man would tolerate freak pylon-type corkscrews ascents.

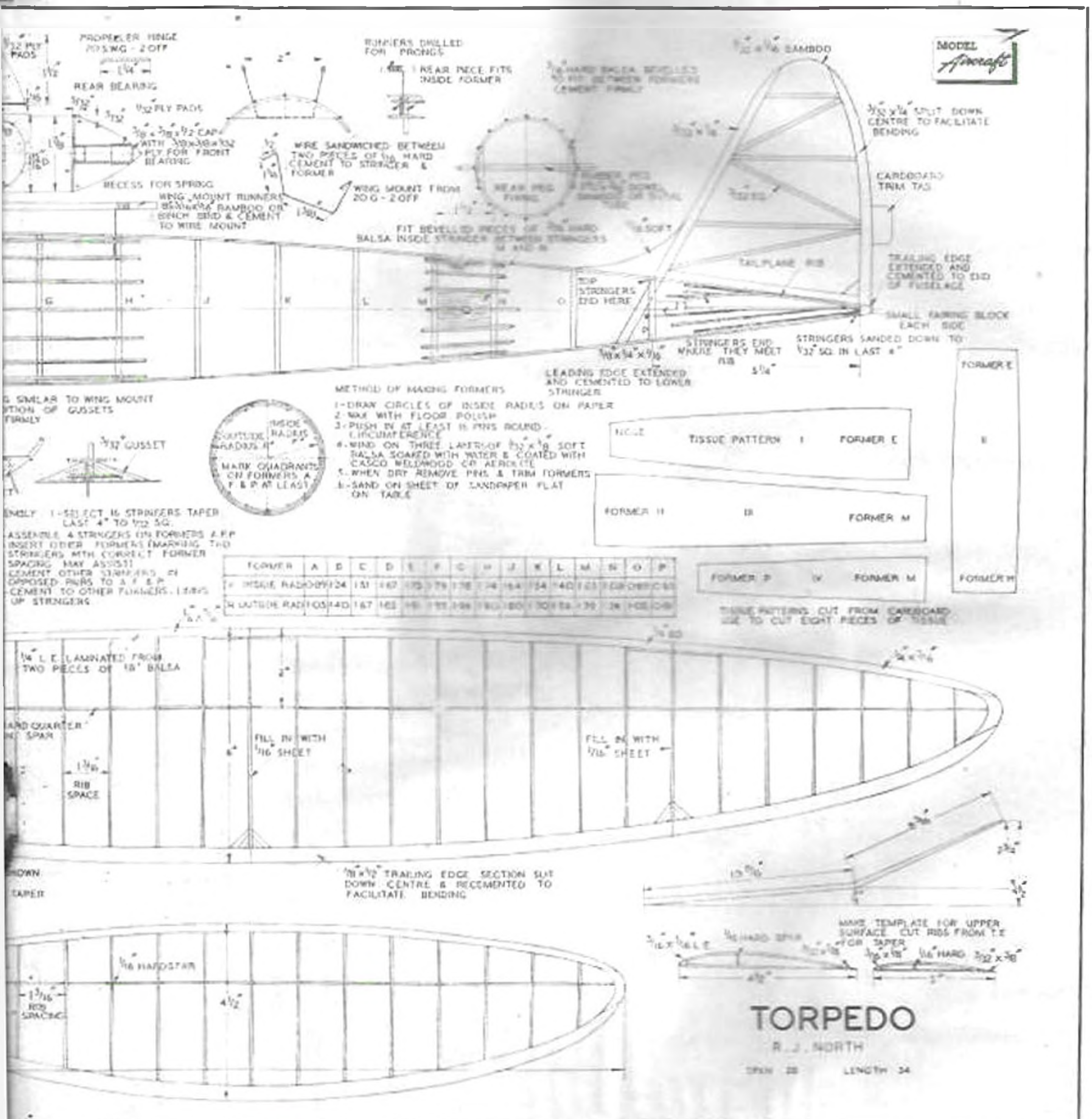
Biplanes to one-eighth scale are excellent fliers, and the writer has a one-eighth scale S.E.5A. fitted with a Frog "100" motor inverted. This machine, to use a cliche, "flew straight off the drawing board." The wingspan is 41½ in., the length overall 36¼ in., and the weight in flying trim 25 oz. It is capable of a smooth take-off and climbs in wide left-hand circles to a height determined by the length of the motor run. The ensuing glide is as flat and slow as that of any normal "duration" type. The writer has had many flights of over 4 min., and so far the only damage sustained has been the fracture of the right hand wing dihedral joint, caused by the machine striking a golf bunker during a take-off. I trust I may be excused for mentioning my own machine in some detail; I merely do so by way of supporting my statement that flying scale biplanes are quite practicable. Some of these braced and be-strutted war-birds of yesteryear are excellent, stable fliers, with a performance quite as good as any cabin type power driven aircraft.

I might mention here that glowplug motors, in their present state of development are quite unsuitable for the powering of scale models. As is well-known, these motors cannot be throttled down to any appreciable extent, and this fact alone would make initial trimming far more difficult.

The model, then, should be designed from a suitable prototype to a scale of one-eighth full size, and powered with a 1 c.c. motor. Use discretion when choosing a high wing monoplane or biplane of the stubby-nosed rotary engine type, such as the Sopwith Camel or Snipe. I am aware that scale models of these types have been built and flown, the use of a cold-setting synthetic glue such as "Weldwood," "Aerolite," or "Casco" will produce much stiffer results than the normal balsa cements and will be quicker, since the cementing and drying of the formers takes place at the same time. The use of a ring of pins as a jig for making the formers is much superior to any other method that I know—certainly it is faster and less laborious than cutting jigs from cardboard or wood. If the strips tend to kink at the pins either the wood is not sufficiently wet or you are winding them too tightly. They will shrink on to the pins when drying.

The wing mount should be made completely and assembled into place before it is cemented. Before

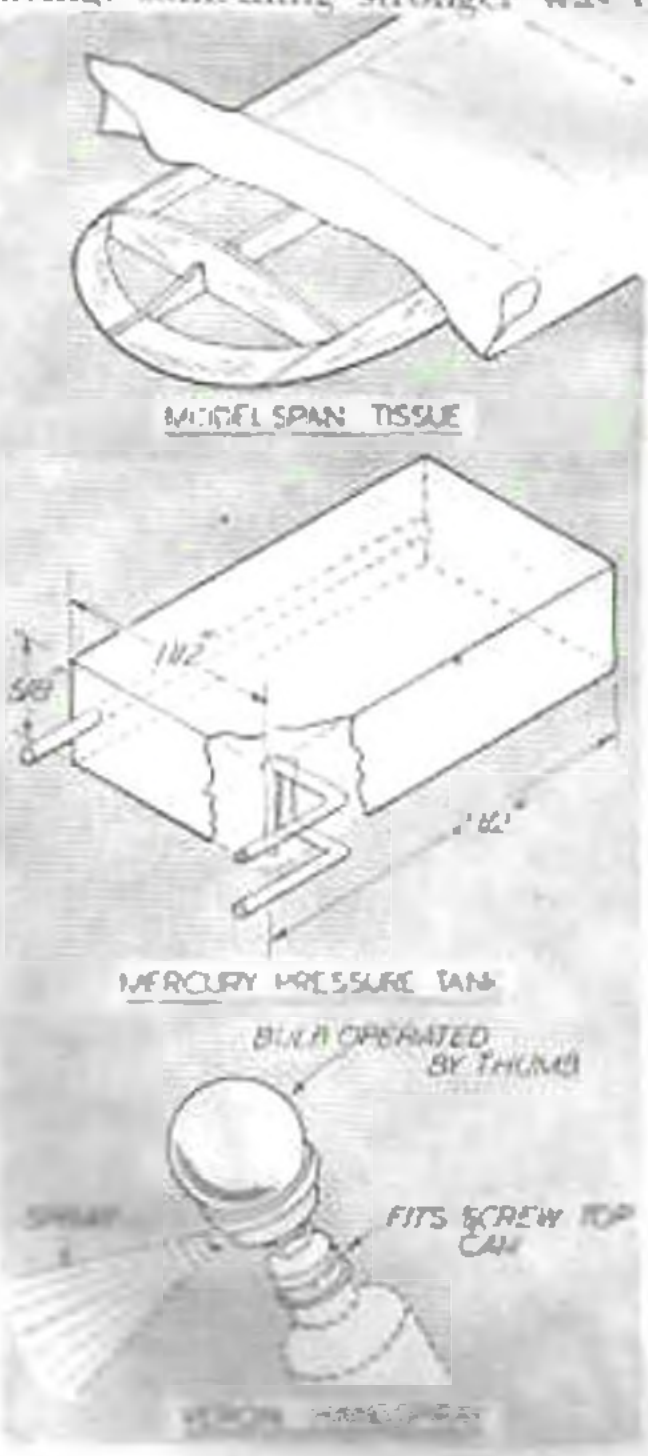
(*Continued on page* 186)



Over the Counter

A FEATURE WHICH WILL BRING YOU UP-TO-DATE NEWS OF THE LATEST TRADE PRODUCTS

TRADITIONALLY, Japanese tissue has been the recognised covering material for model aircraft. But when power modelling came into being, something stronger was obviously necessary. Silk ideal in many respects, is ruled out for average use on account of its high cost and the first successful "power model covering" was undoubtedly bamboo paper, although this suffered from being somewhat brittle. Silkspan, invented in America, then appeared to offer the ideal solution, but this again has proved to be rather brittle. Now, at last, we have a **British** covering paper specially developed for power models—**Modelspan,** manufactured by Berrick Bros. Tough, shrinking well under water, it takes dope readily and appears to be far the best material available for the job. It is available in both *lightweight* and *heavyweight* grades, and in a range of colours.



Mercury Models have a commercial pressurised tank now on the market which really does smooth out troublesome glow-plug motors. Unlike a normal stunt tank, the "Mercury" version is rectangular in shape—not wedge. Fuel supply is taken from the outboard side of the tank, as normally. The two vents are forward facing and enter the tank via the inboard side—not the top and bottom. The top vent turns down to the bottom of the tank; the bottom vent turning up to the top. Dynamic pressure due to the forward speed of the model "pressurises" the inside of the tank and controls the fuel flow.

Once you have got used to using a spray you will never want to go back to the old method of brush-work. The main trouble so far has been in finding a cheap, reliable and easy-to-work spray unit. Here is one we can recommend—the **Veron Handispray.**

All you want is a screw-top can to fit the threaded attachment on the spray unit—and, of course, something to spray! Try it with water first. That is probably its most useful application. Painting water over tissue covering with an ordinary brush is a very hazardous affair. It's all too easy to start a tear—or get too much water on one part so that it takes a long time to dry out. Spraying does a neater, more efficient job in less time. And there is something very satisfying about putting on a spray finish—even if it is only water!

The Handispray is not limited to water, however. It will lift thin cellulose—so you can clear dope those rubber or glider model wings with it. But don't expect it to handle thick coloured dope.

T.D.C.; closes 60 deg. after T.D.C. Transfer-port opens 58 deg. before B.D.C.; closes 58 deg. after B.D.C.; Exhaust-port opens 66 deg. before B.D.C.; closes 66 deg. after B.D.C.

Weight: 17 oz.

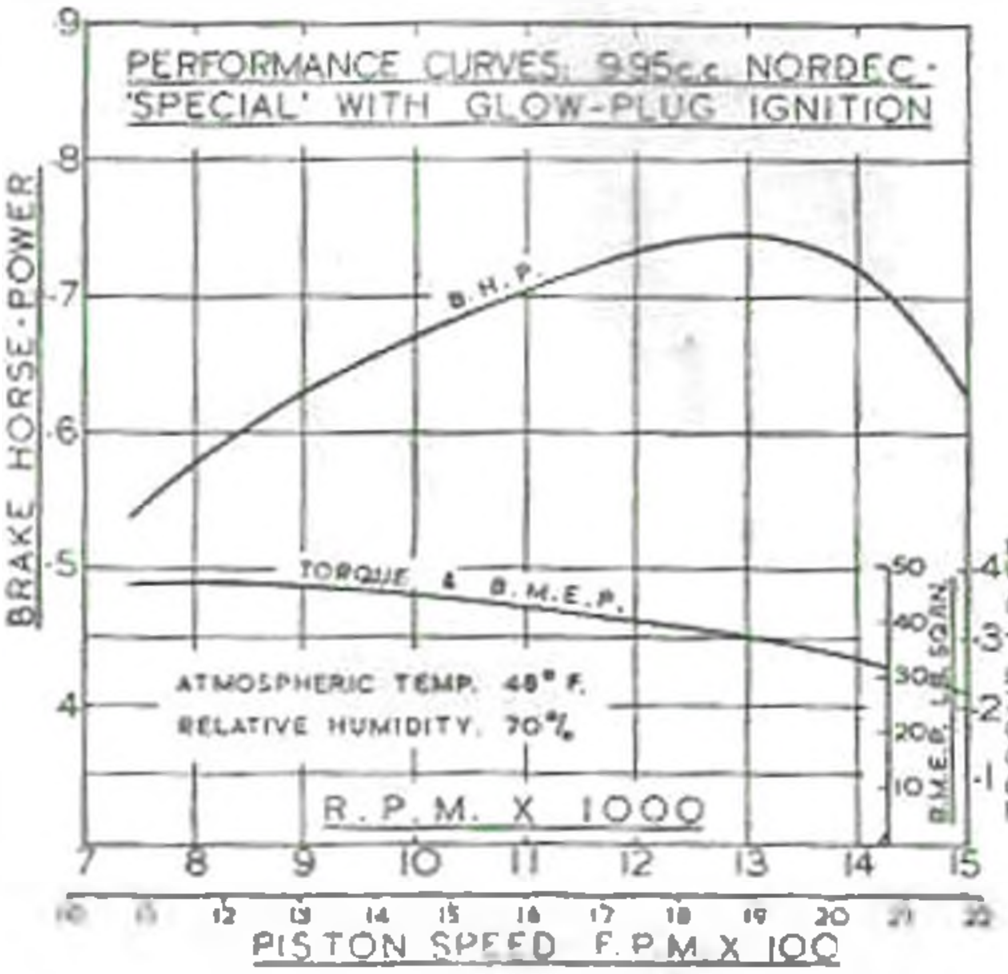
General Structural Data: Sandcast aluminium alloy, DTD.424 crankcase and cylinder barrel. Ground and honed Mechanite cylinder-liner. Piston of DTD.424 alloy, heat treated and diamond turned, with two Mechanite compression rings. Crankshaft of 3 per cent. nickel-steel, hardened and ground and running in two Hoffman ball journal bearings, ⅜ in. and ⅜ in. bore respectively. Front crankcase cover and bearing housing cast and machined from DTD.424. Rear cover and rotary-valve disc cast and machined from DTD 424, with aluminium-bronze valve-shaft bush. Crankcase covers each secured to crankcase with four, and cylinder-head with six, Allen-head screws. Forged light-alloy connecting-rod with aluminium-bronze big-end bush. Tubular steel fully-floating gudgeon-pin, hardened and ground with dural end-pads. Carburettor of machined dural locked in rear cover with grub-screw to permit rotational movement of the needle-valve assembly to suit installation. Car type ignition points. Metal-to-metal joints throughout—no gaskets used.

Test Data

Approximate time logged prior to test: 1 hour.

Ignition equipment used: K.L.G. Miniglow plug. 1.5 V. to start.

Fuel used: Record "Powerplus" racing blend.



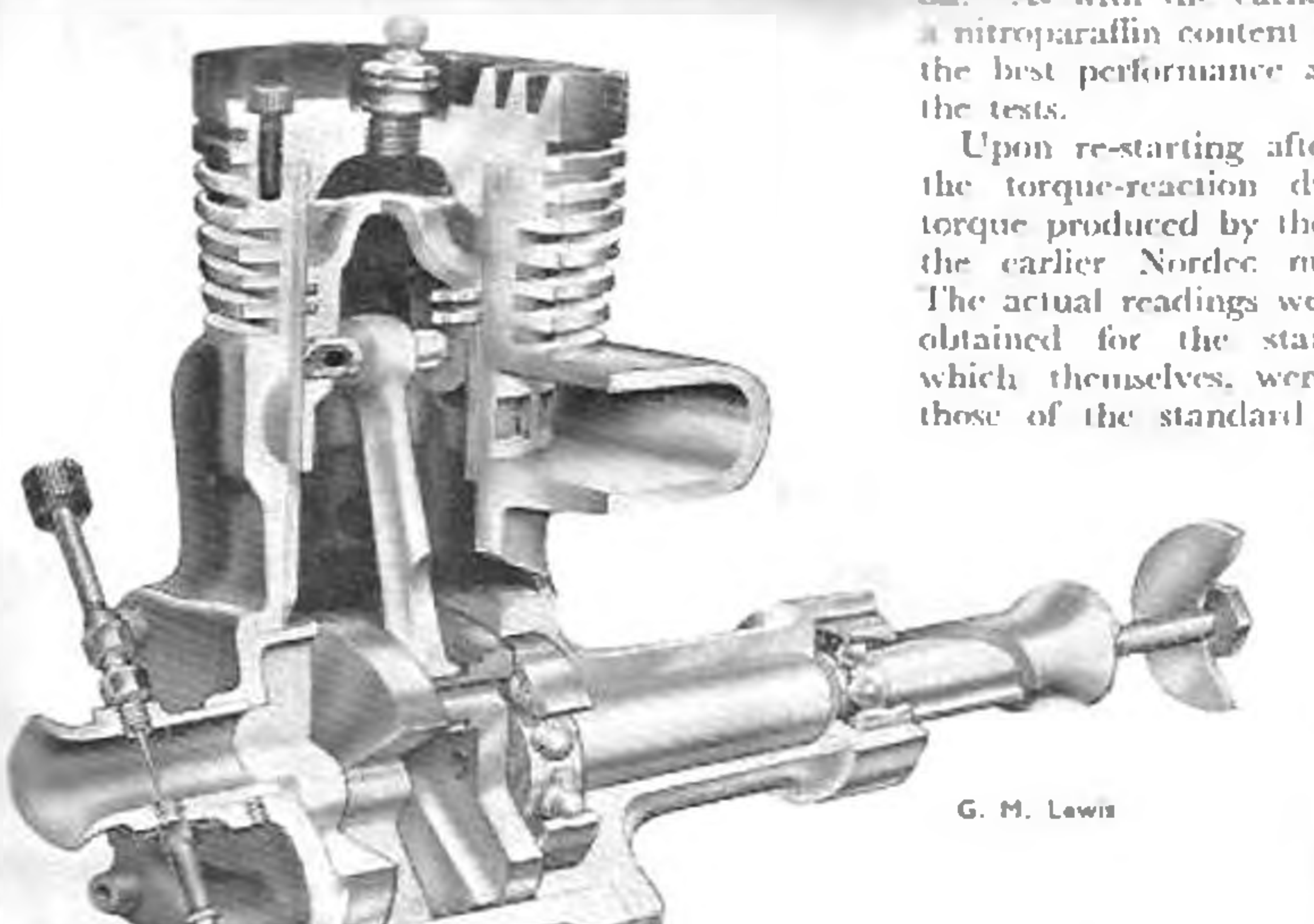
Performance

Using spark-ignition, an engine of this type is always inclined to be difficult to start by hand, but on glow-plugs, the Nordec handled much more easily and, once its preferences in regard to starting procedure had been ascertained, hand starting was performed under various loads up to the peak b.h.p. loading.

Initial running-in was carried out using a heavy 14 in. diameter free-flight airscrew and a straight mixture of five parts methanol and two parts castor-oil. As with the earlier Nordec engines, however, a nitroparaffin content fuel was found to give much the best performance and was, therefore, used for the tests.

Upon re-starting after setting up the engine on the torque-reaction dynamometer, the increased torque produced by the Special, as compared with the earlier Nordec model, was plainly evident. The actual readings were equal to those previously obtained for the standard spark-ignition R.10, which themselves, were some 20 per cent. up on those of the standard R.G.10 on the same fuel. This would appear to give a clear indication of the greater combustion efficiency obtained with the new combustion chamber, combined, possibly, with better scavenging and with increased volumetric efficiency gained by the use of sub-piston supplementary induction.

Starting at 7,000 r.p.m., load was then progressively reduced and torque readings taken up to 15,000 r.p.m. Between about 9,000 and 11,000 r.p.m., readings were inclined to be some-



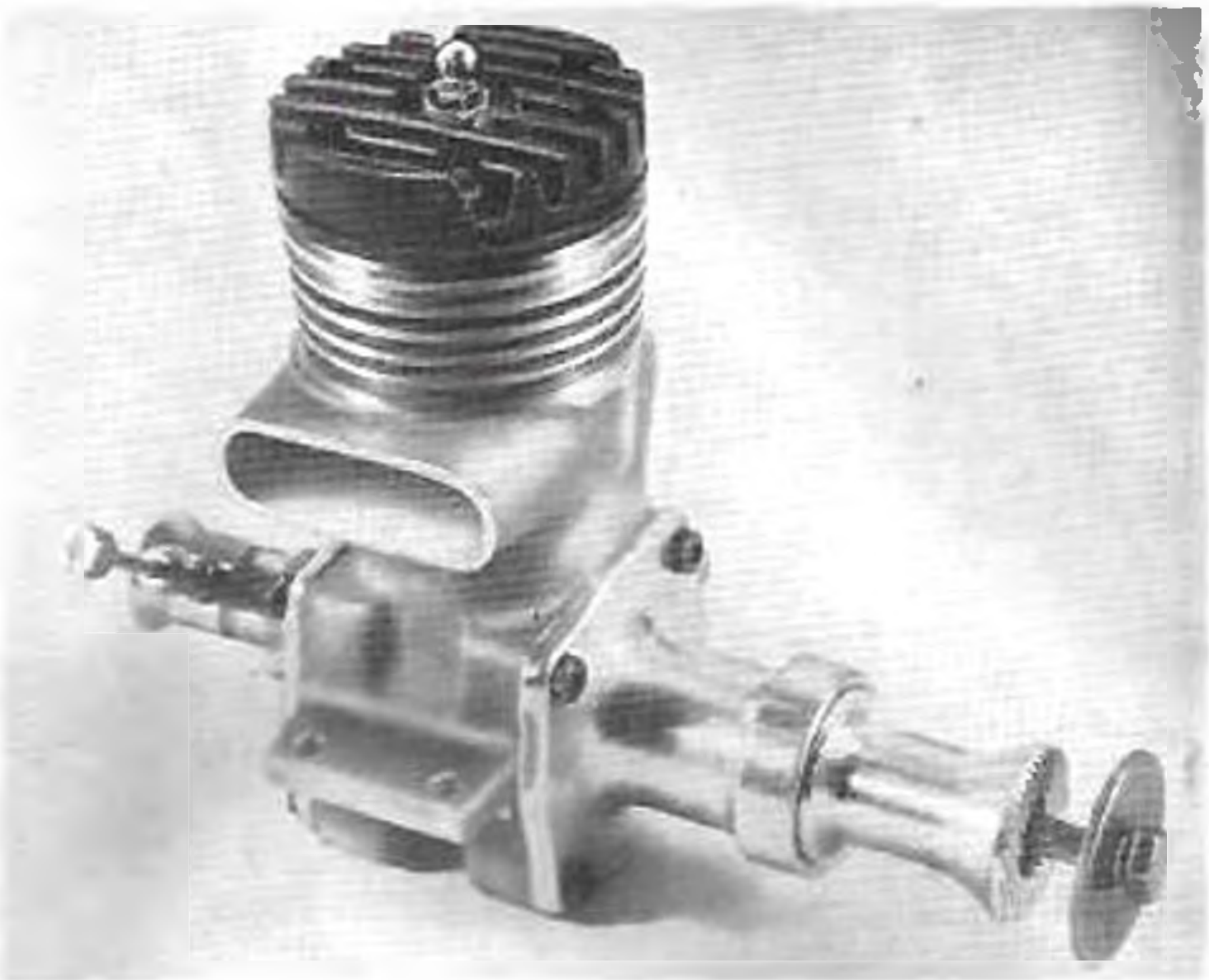
Our artist's cut-away drawing of the new Series II engine clearly shows the internal details.

what inconsistent but, beyond these speeds, torque resumed a steady decline and, when plotting the torque curve, these scattered readings (which, despite re-checks, may have been partly due to maladjustments of needle-valve settings) were, therefore, ignored. Maximum torque was reached at around 8,000 r.p.m., a figure of 73 in. oz. (0.38 lb. ft.) being recorded at this speed.

On plotting the power curve, it was noticed that the peak horsepower was now reached at 13,000 r.p.m., a maximum of nearly 0.75 b.h.p. being obtained at this speed as compared with 0.63 b.h.p. at 12,200 r.p.m. recorded for the earlier R.G. 10 on the same fuel. Based on the respective performances of the standard models, it is possible that this output might be increased to over 0.9 b.h.p. on spark ignition (the makers state that an output of approximately 0.95 b.h.p. has been reached) and it is probable that some experiment with compression-ratios might also increase performance on glow-plug ignition.

The Nordec is a robust job and no mechanical failures, or other troubles of any kind, were experienced during the tests.

Power/Weight Ratio (as tested): 0.71 b.h.p./lb.
Power/Displacement Ratio (as tested): 75 b.h.p./litre.



This photograph shows a general view of the new Series II Nordec Special engine. It will be noted that in general appearance it differs very little from the Series I.

THE NEW SERIES II ENGINE

Since the foregoing was written, an improved "Series II" Nordec-Special has been produced and will be marketed in July. The accompanying cut-away drawing is of this new model. One of the first units has just been received from the North Downs Engineering Company and tests show a very substantial increase in performance over that obtained with the Series I model.

Checks made on this unit between 11,000 r.p.m. and 17,000 r.p.m. on the dynamometer have indicated a maximum output of 1.23 b.h.p., reached at slightly above 15,000 r.p.m.—an increase of well over 60 per cent. in power output over the previous model. It was noted that the engine performed much more smoothly and consistently and that starting was actually easier.

This superior performance has been gained by a number of detail modifications to the Series I engine, the principal effect of which appears to have resulted in greatly increased volumetric efficiency, evidential in higher b.m.e.p. and peak revolutions. These are briefly as follows:

The transfer and exhaust port areas have been increased.

A new cylinder/crankcase casting is used having a transfer passage of much greater volume and fins are integrally cast.

The rotary-valve has been considerably opened out and the rear cover inlet aperture enlarged to coincide with the rotary-valve dimensions. The carburettor throat diameter has been increased from $\frac{5}{16}$ in. to $\frac{3}{8}$ in.

The bore and stroke and compression-ratio of the Series II remain unaltered and the cylinder-head, piston, rings, connecting-rod, crankshaft, etc., are the same as in the Series I engine. Weight, however, has been slightly reduced to 16 oz. by reason of lighter main casting sections.

The performance demonstrated by the Series II unit tested, it will be noted, is the highest so far published in these articles.

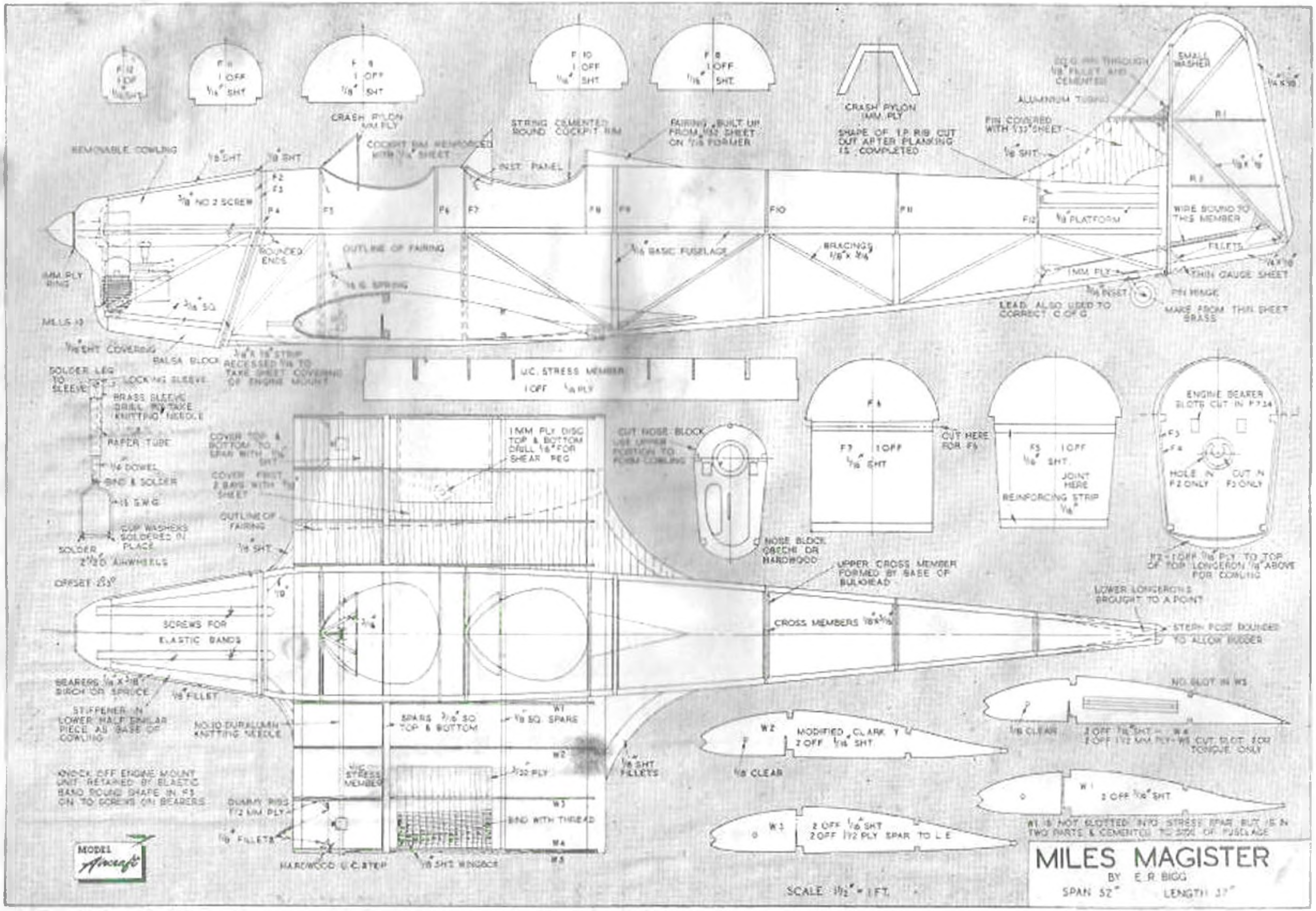
Power/Weight Ratio (as tested): 1.23 b.h.p./lb.
Power/Displacement Ratio (as tested): 124 b.h.p./litre.

B.H.P. CHECK—NORDEC-SPECIAL RACING ENGINE

Improved "Series II" Model

Speed	Power Developed
11,000 r.p.m.	0.985 b.h.p.
12,000 r.p.m.	1.07 b.h.p.
13,000 r.p.m.	1.14 b.h.p.
14,000 r.p.m.	1.2 b.h.p.
15,000 r.p.m.	1.23 b.h.p.
16,000 r.p.m.	1.21 b.h.p.
17,000 r.p.m.	1.13 b.h.p.

Atmospheric conditions: Humid. Air temp.: 50 deg. F. Ignition: Glowplug (K.L.G.). Fuel: "Record." Engine stated to have been partly run-in.


MILES MAGISTER
BY E. R. BIGG
SPAN 52" LENGTH 37"
SCALE 1½" = 1 FT.
MODEL Aircraft
REMOVABLE COWLING
CRASH PYLON 1MM PLY
COCKPIT RIM REINFORCED WITH 1/16" SHEET
STRING CEMENTED ROUND COCKPIT RIM
INST. PANEL
FAIRING BUILT UP FROM 1/32 SHEET ON 1/16 FORMER
SHAPE OF T.P. RIB CUT OUT AFTER PLANKING IS COMPLETED
FIN COVERED WITH 1/32" SHEET
ALUMINIUM TUBING
SMALL WASHER
WIRE BOUND TO THIS MEMBER
1/8" PLATFORM
FILLETS
THIN GAUGE SHEET
FIN HINGE
MAKE FROM THIN SHEET BRASS
LEAD ALSO USED TO CORRECT C. OF G.
BRACINGS 1/8" X 3/16"
3/16" BASIC FUSELAGE
OUTLINE OF FAIRING
ROUNDED ENDS
1MM PLY RING
MILLS 1.3
1/16" SHT. COVERING
BALSA BLOCK
U.C. STRESS MEMBER 1 OFF 1/8 PLY
1MM PLY DISC TOP & BOTTOM DRILL 1/8" FOR SHEAR PEG
CUT NOSE BLOCK USE UPPER PORTION TO FORM COWLING
NOSE BLOCK OBECHI OR HARDWOOD
UPPER CROSS MEMBER FORMED BY BASE OF BULKHEAD
ENGINE BEARER SLOTS CUT IN F.2.3.4
CUT HERE FOR F6
REINFORCING STRIP 1/16"
HOLE IN F2 ONLY
LOWER LONGERONS BROUGHT TO A POINT
STERN POST ROUNDED TO ALLOW RUDDER
CROSS MEMBERS
SCREWS FOR ELASTIC BANDS
BEARERS 1/4 X 3/16" BIRCH OR SPRUCE
1/8" FILLET
NO.10 DURALUMIN KNITTING NEEDLE
KNOCK OFF ENGINE MOUNT UNIT RETAINED BY ELASTIC BAND ROUND SHAPE IN F3 ON TO SCREWS ON BEARERS
SPARS 3/16 SQ. TOP & BOTTOM
1/8 SQ. SPARE
U.C. STRESS MEMBER
BIND WITH THREAD
HARDWOOD U.C. STEP
1/16" FILLETS
MODIFIED CLARK Y
1/8 CLEAR
1/8 SHT FILLETS
NO SLOT IN W5
W1 IS NOT SLOTTED INTO STRESS SPAR BUT IS IN TWO PARTS & CEMENTED TO SIDE OF FUSELAGE
PAPER TUBE
1/4 DOWEL
BIND & SOLDER
18 S.W.G.
CUP WASHERS SOLDERED IN PLACE
SOLDER
2½" DIA. AIRWHEELS
OFFSET 2½°

THE *Magister* was the result of a desire on my part to build something a little different. In 1948 I designed and built a 48 in. span "Blackburn Firebrand" and it was after my experiences with this model that I took up my pencil and evolved the *Magister*. "The low wing bug" had got me, and its problems only increased my interest.

An initial trouble was a tendency to swing right on take-off, and this was found to be entirely due to careless launching. The large side area of the *Magister* makes it a good weather vane! This does not matter once she is well airborne, but if the model is launched or made to take-off r.o.g. with the wind blowing from its port side it has great difficulty in circling left into wind. So be warned, always launch straight into wind or with the wind coming slightly from your right and you will have no trouble in this respect.

Do not expect the *Magister* to have a rocket-like climb; with the Mills 1.3 c.c. engine scale flight is obtained, the model cruising up in a steady climb. If over elevated a steeper climb is obtained but a stall will develop on the glide.

Fuselage

The basic frame of $\frac{1}{16}$ in. is built in the usual manner, the two sides being built on the plan. On removal from the plan the stern post is inserted and then, working forward, the cross-members, formers, and bulkheads are cemented into position until the fuselage shape is obtained. Next place the first $\frac{1}{8}$ in. × $\frac{1}{16}$ in. plank along the top of the fuselage and glue into position, thus ensuring that the formers above the basic frame are linked together and so protected from damage whilst other work is done. Cement into place the tailplane platform and the ply and block for the tail-wheel. Insert fillets behind first bulkhead as shown on the plan.

Sheet the sides of the fuselage and plank the upper curved section with $\frac{1}{32}$ in. sheet. Do *not* sheet the bottom of the fuselage yet. Mark out on the sheeting the cockpit shapes and tailplane position; carefully cut these out and reinforce rim of cockpits as shown on plan. (N.B.—It is a great help if the position of formers F.5-8 and the tailplane platform are marked in pencil before the last plank is put in place.) Cement into position the fin leading edge and link to sternpost with half rib. Sheet the fin with 1/32 in. sheet. Build up head-rest.

Centre-Section

Mark on the side of the fuselage the position of rib W.1 and cement rib in place. (Note that U/C stress member cuts this rib completely in two.) Carefully cut out on both ribs the holes through which the leading edge, U/C stress spar, the main-spars, and the anti-warp spar are to pass. Cut out all parts necessary to build the centre-section, marking with a pencil where ribs will come when assembled.

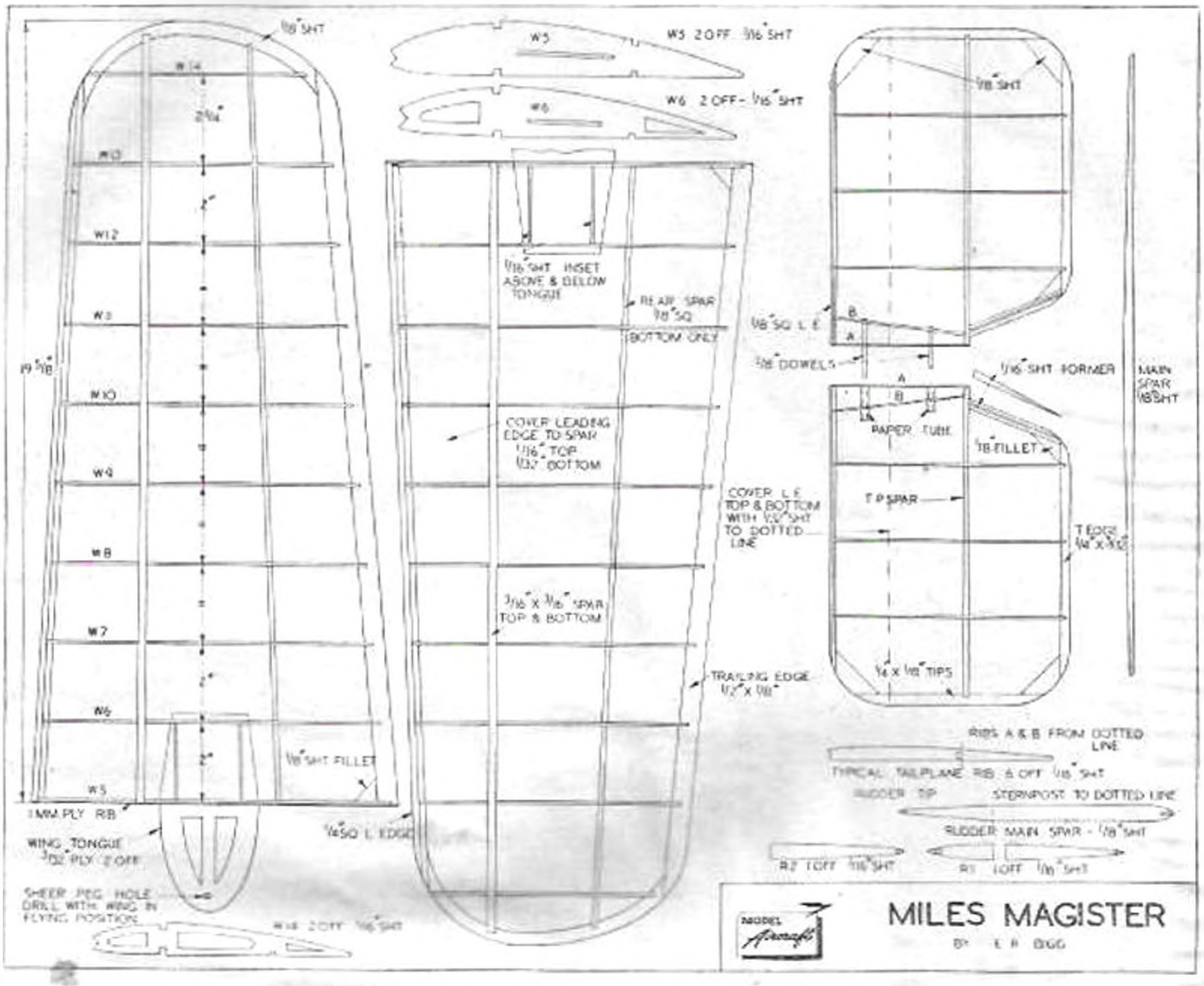
Cement lower main spar to U/C stress spar. Insert through fuselage. Cement ribs in place on this only. Now add the upper main spar, leading edge, anti-warp spars and trailing edge. (The lower anti-warp spar and the trailing edge do not pass through the fuselage.)

Check centre section for alignment and be certain that ribs W.4 on each side are at the same angle of incidence, if necessary steam until this is so. Build in wing boxes and blind well. Do *not* sheet the centre-section until U/C assembly is complete.

Wings

These require little explanation and are of straight-forward construction. The Clark Y section allows them to be built flat on the plan and so ensures

FULL SIZE DRAWINGS ARE OBTAINABLE FROM YOUR LOCAL DEALER, OR BY POST FROM THE "MODEL AIRCRAFT" PLANS DEPARTMENT, 23, GREAT QUEEN ST., LONDON, W.C.2, TWO SHEETS 7s. 6d. POST FREE



good alignment. The intervening ribs are constructed by using W.5 and W.13 as templates and placing the remainder as blanks in between them, carefully cutting and sandpapering them to the correct aerofoil shape.

All ribs are of $\frac{1}{16}$ in. sheet with the exception of the ply strengthening rib at the root. It is important however, that W.5 is cemented into place and the ply tongue inserted with the wing in flying position and entered into the wing box. This ensures a good joint between wing and centre-section.

Sheet the leading edge and insert $\frac{1}{16}$ in. sheet strengtheners in two root-rib bays.

Rudder

This is built up off the plan after all the parts have been cut to shape and size. Drill a hole through the stern post to allow for the insertion of the pendulum rudder mechanism. Hinge rudder as shown on plan. Insert 18 s.w.g. wire pendulum as shown and bind to rudder member.

N.B.—The pendulum weight is utilised to adjust the C.G. position if necessary, so that it is immediately behind the main spar.

Tailplane

This is built in two sections and is thus removable for ease of transport. If the fairing is cut away carefully the tailplane should be a nice snug fit and will need no other means of attachment apart from the dowels joining the two halves.

Undercarriage

Carefully mark the position of the hole for insertion of rod or knitting needle. Drill very carefully a $\frac{1}{8}$ in. hole through W.4 and W.3. The remainder of holes are burnt through with a suitable implement.

Insert the needle and check for alignment. Remove and drill a $\frac{1}{16}$ in. hole through centre of needle for insertion of 16 s.w.g. wire spring. File small flat on needle where U/C legs will be locked in position. Re-insert needle slipping on U/C legs and central sleeve. Glue in place U/C stops between W.3 and 4. Insert wire spring inside forward cockpit and glue ply strengtheners across the face of F.5, where indicated on the plan. Lock the U/C legs in position and check for alignment.

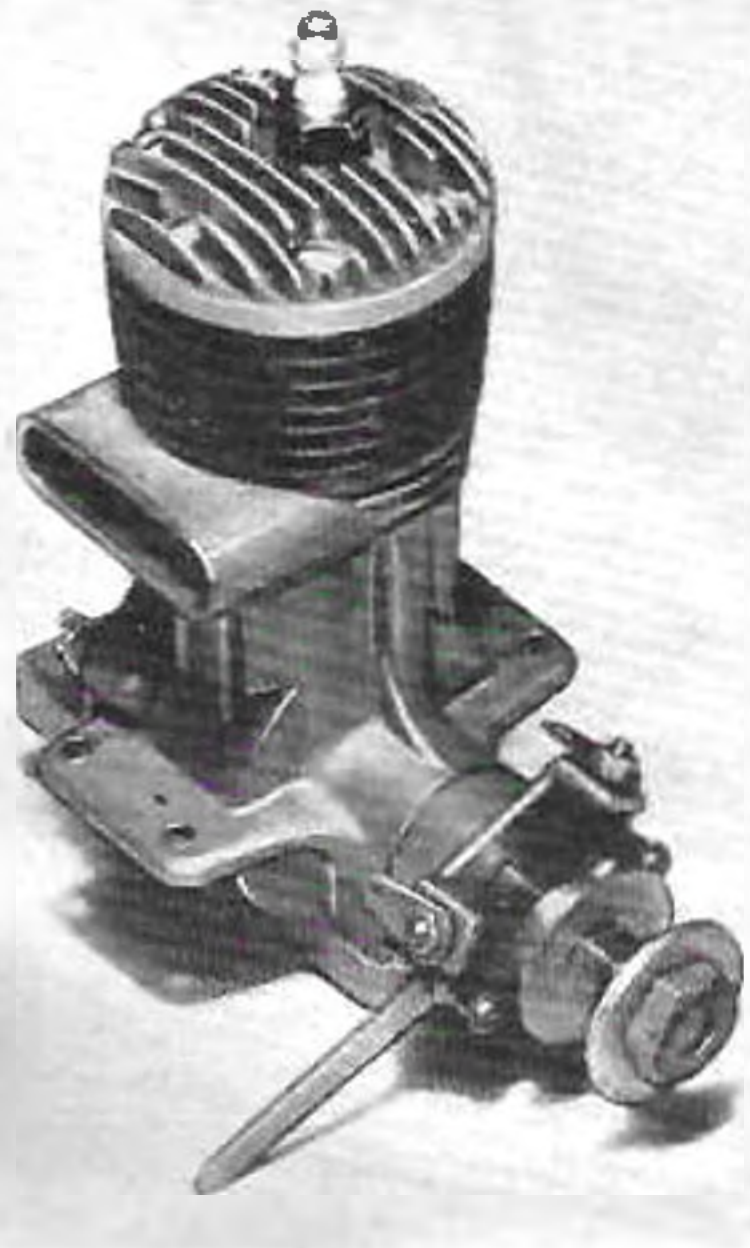
When the rudder and U/C are completed the bottom of the fuselage and the centre section may be sheeted. Do not do it before.

KNOW YOUR ENGINE

PART IV

GENERAL OPERATIONAL INFORMATION

By P. G. F. Chinn



A popular American 10 c.c. spark ignition engine, the Atwood Champion. This example is fitted with a two-speed contact breaker.

THE subject of starting and running procedure has been deliberately left until the final article in this short series, since it was felt that only from an appreciation of the fundamentals of model i.c. engine design, operation and installation, would the basic requirements essential to reliable starting be fully understood.

As we have seen, trends in model engine design during the past few years have been towards steadily increasing power and speed. Compared with the performance of the average commercially-made model two-stroke of 10 years ago, the model aircraft engine has made tremendous strides in this direction. Whereas, in 1939, an output of $\frac{1}{4}$ h.p. from a 10 c.c. engine could be considered good, current competition engines of only one-third of this capacity are developing equal power, while racing types are delivering four to six times as much power for an equivalent capacity.

Increased performance is seldom gained without some penalty however, and, in practically every type of i.c. engine, raising output is accompanied by increased handling complications. Present-day model aircraft engines, for the most part, are no easier to start than those of ten years ago. Racing types, in fact, are generally considerably more difficult. The almost universal adoption of compression-ignition and glow-plug ignition in place of induction-coil and battery type spark ignition has, of course, reduced the possible causes of trouble which can complicate starting, but this gain in reliability has hardly compensated the increased low-speed carburation problems which have been brought about by large ports and gas passages.

However, whereas a few years ago, practically all model aircraft motors were of strictly standard design and showed similar starting and running characteristics, the many and varied types of engines currently available do include some extremely easy-to-handle types and the beginner is well advised to forget about " hot " performance and to commence his power modelling with something more docile.

Generally, the most easily operated types are to be found among the small diesels, such as the Mills 0.75 c.c. and 1.3 c.c. and Amco 0.87 c.c., as listed in Table I in the first article. To these may now be added the new 1.49 c.c. Allbon Javelin, which, despite a somewhat higher output, remains remarkably easy to start. Some glow-plug engines are also very easy to handle, the Allbon Arrow and the American Arden engines being good examples.

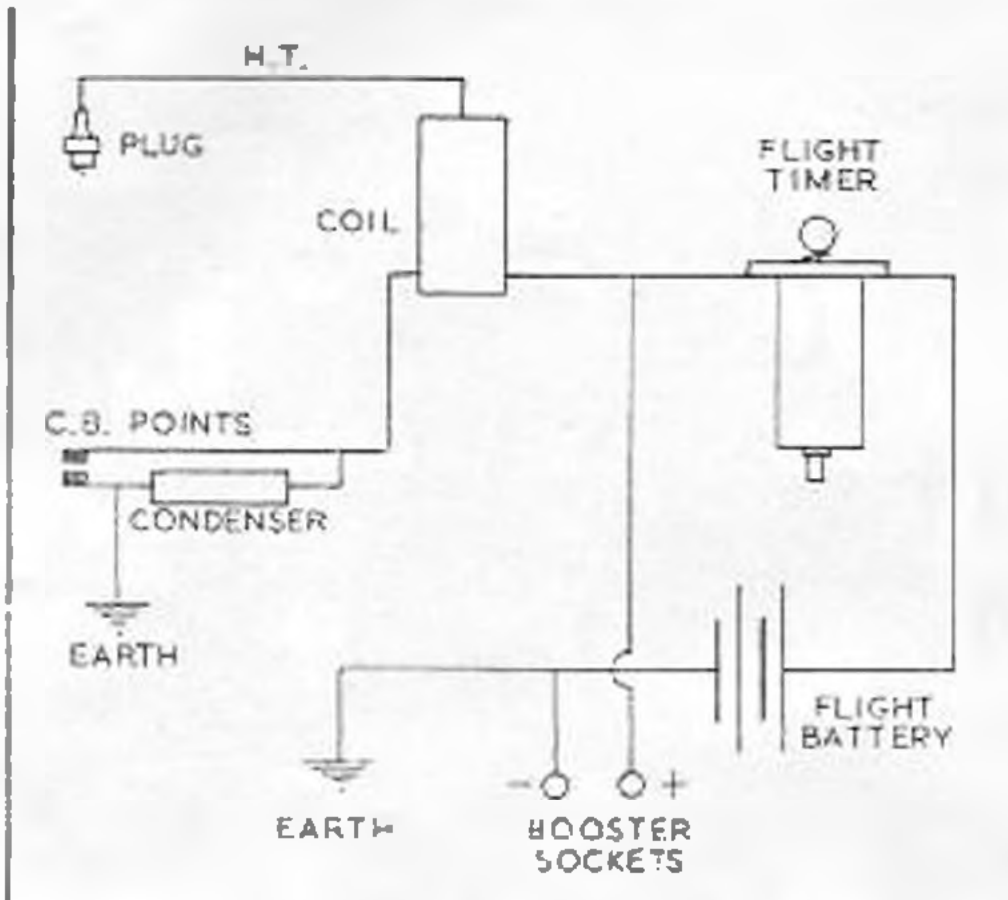
Among medium size engines, certain of the older spark-ignition petrol types still produced are quite easy to start. Some high-speed, high-output diesels, on the other hand, are rather more difficult, as are most racing glow-plug types. Most tricky of all are the spark-ignition racing engines, which, having ignition advance pre-set for high revs., usually require an electric starter.

In the course of time, the experienced model engine enthusiast will come to recognise what is required by almost any engine to obtain a sure start. By touch, sight and sound, as he flicks over the propeller, he will detect whether an engine is going to start or not and, almost instinctively, will make the necessary adjustments. Occasionally, of course, an engine will defy even the most expert. A few racing engines are particularly unpredictable in this respect and, unless one determines the best procedure and sticks rigidly to it, cannot be relied upon to start, even within the time laid down at most contests. The small " beginners' " diesels mentioned, however, are instant starters in the hands of the expert and only a mechanical defect, or fuel trouble, should be responsible for the experienced modeller's failure to obtain a quick start from them.

From the foregoing, it will be apparent that written instructions can only serve as a guide to the beginner and he should not be discouraged if his early efforts do not go smoothly. Learning to operate a model i.c. engine is almost like learning to drive a car; one can learn the elements of what one has to do from a book, but doing it properly only comes with experience. The following procedure, therefore, should be read with this in mind.

Taking the small, easy-to-operate, diesels first, initial requirements are a firm mounting, a suitable airscrew and, if this is not already fitted to the engine, a fuel tank suitably positioned to give a short suction

FIG. 1



STANDARD F/F IGNITION CIRCUIT

feed, i.e., mounted close to the engine and at a height which will place the fuel level, when the tank is full, on a level with, or slightly below, the carburettor jet. For initial running and running-in, a fairly large diameter fine pitch airscrew makes for easiest starting and a free-flight type therefore, is to be preferred.

An indication of suitable propeller sizes is given in Table IV. Included are diameters and pitches suitable for semi-scale and power-duration free-flight models and for stunt and speed control-liners, based on engine power and revolutions and assuming models of conventional design and loadings.

TABLE IV.—AIRSCREW GUIDE

Engines	Airscrews—Diameters x Pitches in inches.*			
	Free-flight		Control-line	
	Precision and Running-in	Fast climb Comp. P.D.	Aerobatic	Speed
Mills 75, Amco 87 ...	8 x 4	7 x 4	7 x 5	
E.D. Bee	9 x 4	8 x 4	7 x 6	
Frog 100	9 x 5	8 x 5	8 x 6	
Mills Mk.II ...	9 x 5	8 x 6	8 x 8	6 x 10
Frog 160		8 x 5	8 x 6	6 x 9
Frog 180	10 x 4	9 x 5	8 x 8	
Allbon Arrow ...		8 x 4	7 x 6	6 x 9
Allbon Javelin ...	9 x 5	8 x 5	8 x 6	6 x 10
Elfin 1.8	10 x 4	8 x 6	8 x 8	6 x 10
K. Falcon	10 x 4	8 x 6	8 x 8	7 x 10
E.D. Comp. Special	10 x 5	9 x 6	9 x 8	
Mills 2.4	11 x 5	10 x 5	9 x 8	
Frog 250	11 x 5	10 x 5	9 x 8	
Elfin 2.49	11 x 5	9 x 6	9 x 8	
Amco 3.5	12 x 5	10 x 6	9 x 8	7 x 10
Eta 19		10 x 5	9 x 4	7 x 10
E.D. Mk.IV ...	12 x 5	10 x 6	9 x 8	
K Vulture	13 x 6	11 x 6	10 x 8	
Eta 5	13 x 6	12 x 7	10 x 10	
Wildcat Mk.III ...	13 x 6	12 x 6	10 x 8	
Yulon 30		10 x 6	9 x 8	7 x 10
Frog 500	13 x 6	11 x 5	9 x 8	8 x 10
Eta 29		11 x 5	9 x 8	8 x 10
Norder-Special ...				9 x 10
Rowell 60 ...				9 x 12

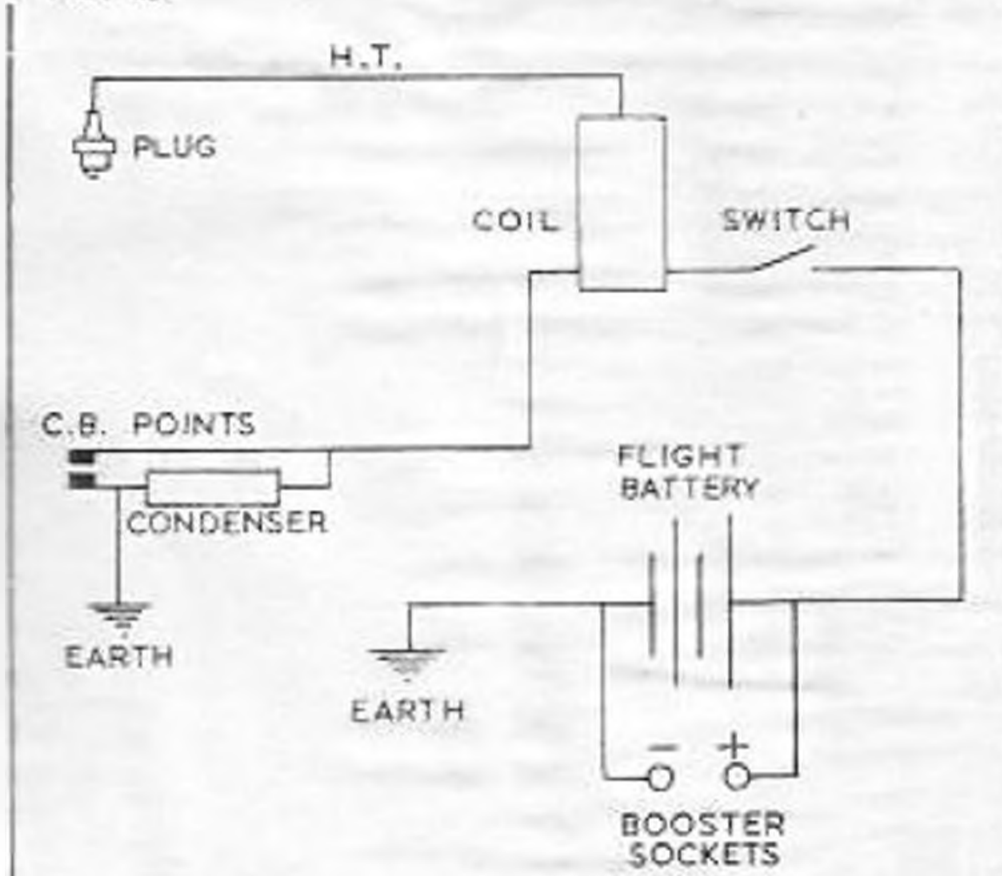
*Note.—Dimensions are for standard propellers and suitable for average models only. Optimum dimensions for any engine/model combination are critical, particularly for speed work and will demand experiment to achieve maximum performance.

In most cases, the compression and needle-valve settings of each production unit are noted before engines leave the works and are included on an inspection card or instruction leaflet provided with the engine. These settings usually correspond approximately to those required for starting on a normal free-flight propeller and are unlikely to vary to any great extent, even when different fuels are used. For ease of starting and in making running adjustments, a good quality nitrated fuel, preferably of a castor base, is recommended and is better from every consideration than some of the widely assorted mixtures that one occasionally finds quoted in makers' literature. Make sure that the air intake and exhaust ports are free from any particles of dirt and turn the engine over carefully to ensure that it rotates quite freely.

With the fuel tank full and the compression-lever and needle-valve at the specified settings, the engine is now choked by placing a finger over the carburettor air intake and the propeller flipped over two or three times. Unless a vertical intake is fitted, the finger will appear wet with fuel, indicating that mixture is reaching the jet. The propeller is then flicked with the intake open and it will probably be noticed that the engine now sounds "wet" and that it turns over more easily. The engine should now start within half-a-dozen flicks. If it does so, but only gives a short burst, insufficient fuel is indicated and the needle-valve should therefore be opened slightly more, the engine choked a couple of times, and re-started.

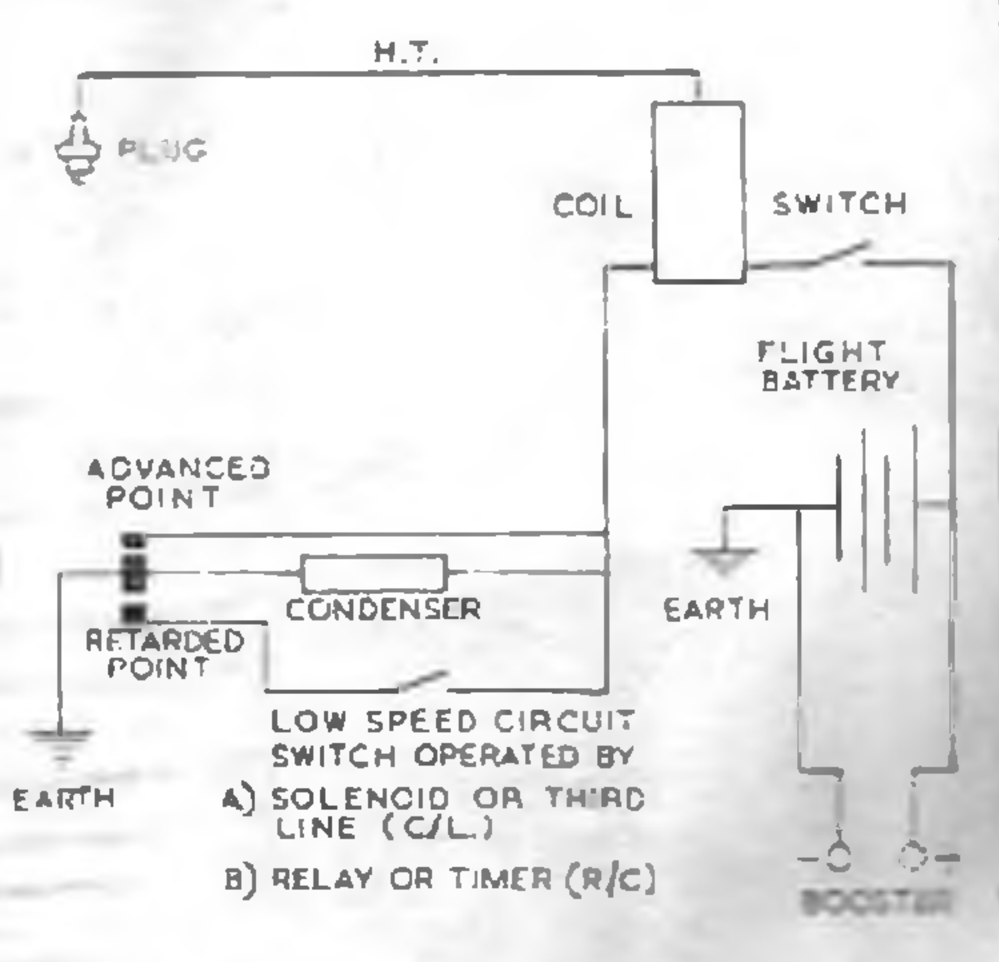
If the engine does not start, this may be due to insufficient compression, insufficient fuel, or both. Procedure, therefore, is to choke, increase compression slightly, and try again. It should be remembered that provided fuel is reaching the combustion-chamber, it is only a case of finding the correct compression to fire the mixture.

FIG. 2



STANDARD C/L IGNITION CIRCUIT

FIG. 3



TWO-SPEED IGNITION CIRCUIT

Probably the most frequent cause of failure to obtain a start is insufficient fuel. When an engine is flicked continuously, without any sign of firing, this is almost certain to be the case. Nevertheless, it is better to first try compression adjustment since continually increasing the needle-valve setting, without adequate compression, may well result in the crankcase becoming flooded with the result that the engine will " hydraulic " when it does fire and may then be difficult to clear.

If the engine does become flooded, this will be indicated by increased resistance to flicking over top-dead-centre and, possibly, if the engine fires in this condition, by the propeller being kicked loose. If this occurs, compression should be reduced, usually by at least half a turn of the lever. A partially flooded engine can be started on a reduced compression setting, compression then being increased as the excess fuel is used up, but if the engine is badly flooded, it should first be cleared by inverting it to drain the raw fuel into the cylinder and then blowing this out via the exhaust ports.

The adjustment of controls from starting to running settings varies considerably with different engines and it is almost impossible to generalise on this point. However, it may be said that needle-valve settings usually require to be reduced but never increased. Compression settings, on the other hand, require reducing with some engines but increasing with others to obtain maximum performance. As we have already seen, light loads and high-speed running, i.e., small propellers, require early ignition and a considerably higher compression setting will, therefore, be necessary when a small diameter racing propeller running at, say, 10,000 r.p.m., is fitted, than with a large free-flight airscrew running at only 5,000 r.p.m. Usually, when a small propeller is used, it is necessary to reduce compression to obtain the correct ignition timing for a finger-flick start, increasing this by as much as half a turn as soon as the engine is running.

The highest revolutions obtainable with any particular airscrew are achieved with a relatively weak mixture (i.e., reduced jet opening) and high compression setting. These adjustments are reached, approximately, when any further increase in compression results in a slowing down of the engine which cannot be compensated by a further reduction to the needle setting. With the critical compression found, the best performance is then reached at a needle-valve setting very slightly wider than that at which a slight harshness is detected and beyond which misfiring and, eventually, complete cutting out, is obtained.

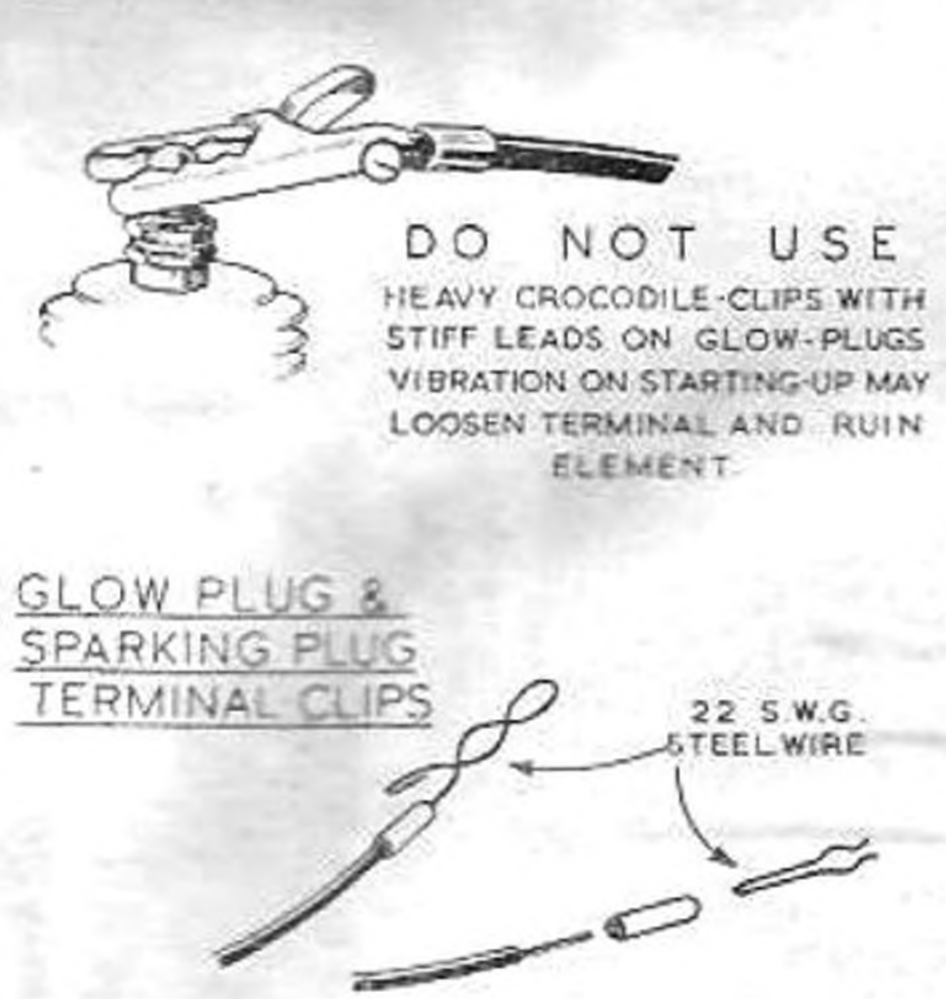
With the introduction of chemically treated diesel fuels, finding these optimum settings, without much knocking and misfiring, has been rendered a good deal easier. With these fuels, too, equal or slightly superior power output is obtained with a lower compression ratio and, when using them the compression-lever should be slackened off as the engine warms up to allow it to run at maximum speed.

With regard to the more powerful " competition " type diesels currently available, the same basic starting procedure as described above, is applicable. With these types, however, it is often found helpful, to obtain a quick start, to prime with a few drops of fuel through the exhaust ports on to the piston crown, in addition to choking the engine in the normal manner. Often a somewhat " wetter " condition is necessary to secure a start than is required with the " beginners' " engine.

Spark ignition is less popular for model aircraft these days although, in many respects, starting and general operation are more straightforward.

Firstly, however, the ignition system must be

FIG. 4



GLOW PLUG & SPARKING PLUG TERMINAL CLIPS correctly wired up to eliminate, as far as possible, any troubles occurring in this quarter. Typical wiring diagrams for free-flight and C/L models are given in Figs. 1, 2 and 3. Usual recommendations when positioning the ignition accessories, are to mount the condenser as close as possible to the contact-breaker assembly, but to position the coil a few inches back from the engine, keeping all wiring as short as possible.

A good insulated stranded copper wire is best for wiring the circuit and, if any of this is to be exposed to petroil, a plastic covering is preferable to rubber which will rot if in contact with petroleum base fuels. All wire joints and connections should be soldered (avoiding the use of acid fluxes, of course) either directly to the respective components or, better still, to suitable clips or terminal ends which will permit clean firm connections to terminals on the coil, condenser, contact-breaker, etc.

Most model ignition coils are designed to operate on 3 V, consisting of either one or two penlite batteries and the British M.I. coils, which are particularly good, and most of the American competition coils function satisfactorily, without excessively frequent renewal, on these. Some of the older types of coil, however, do not give reliable performance on 3 V and 4½ V flat type flash-lamp battery is often worth while in the case of the larger types of model. Most racing engines, also, require heavy duty coils functioning on 4½ V.

Although a few model coils have been designed to operate on small dry cells without the aid of a booster starting battery, the assistance of a booster is essential with the majority of coils at present in use. The best type of booster is undoubtedly a lead-acid accumulator of 4 V, e.g., either two cells coupled in series or 4 V tapped from a 6 V battery. When wiring the model ignition circuit, two terminals are installed on the fuselage enabling the booster to be plugged in, in parallel with the circuit, as shown in the diagrams.

A typical British compression-ignition engine, the 2 c.c. "K" Falcon.

The controls normally provided on a model petrol engine are, of course, the needle-valve and contact-breaker advance and retard. The latter, as we have seen, is used for the adjustment of ignition timing to suit various speeds and loads, and, for starting, the ignition should be retarded by moving the contact-breaker arm with the direction of crankshaft rotation.

Again, the makers' settings should be followed and basic starting drill is similar to that already described for the diesel. Normal procedure employed by the writer with conventional petrol engines, is to choke the carburettor for two or three flicks, supplementing this with a small prime through the exhaust port. Unlike the diesel, where firing of the charge is dependent on a critical compression temperature being reached, the petrol engine is bound to fire once mixture is in the combustion chamber, provided that there is a good spark at the plug. A check, before attempting to start, to see that the ignition system is functioning is advisable by removing the plug lead and holding this not more than ⅛ in. from the cylinder-head and noting whether a spark regularly bridges this gap as the engine is turned over.

The petrol engine, it should be noted, is more sensitive to mixture strength adjustment than other types and care should be taken to avoid excessively wide needle-valve settings which will lead to flooding.

When the engine is running, the ignition may be advanced to increase speed up to the maximum possible under the load of the propeller used. With the ignition advanced, the engine will require a weaker mixture to maintain even two-stroking and the needle-valve should, therefore, be closed slightly until this is obtained.

Petrol-type engines running on alcohol fuels respond to the same general procedure but a wider jet setting is demanded; an engine running on one-and-a-half turns open with petroil fuel, for example, usually requires about two-and-a-half turns of the needle when a change is made to methanol base mixtures. Methanol fuels provide the greatest power and revolutions but are only used to full advantage in high-speed engines having relatively high compression-ratios. It is not generally worth while to use methanol in any engine having a compression-ratio of less than 7 : 1 and running at speeds much below 10,000 r.p.m.

Racing type engines which peak their output at 15,000 r.p.m. and more, are run on methanol base fuels exclusively. Normal procedure with spark ignition racing engines is to pre-set the ignition-timing at optimum advance, after determining maximum performance by tests. The contact-breaker is then locked in position and cannot be retarded for hand starting. Under these conditions, an electric starter is essential.

The response of racing engines to glow-plug ignition varies considerably but all are generally more easy to handle on this form of ignition and can usually be started by hand. Fairly generous priming is required through the exhaust ports although the best needle-valve settings for starting

(Continued on page 182)

Team Racing Tanks

TEAM RACING RULES

1. A Team Race shall consist of two or more models, each made to the correct specification, flown at the same time, in the same circle over a pre-determined distance. The winner shall be the first to cover the required distance from a standing start. All models must start at the same time and be flown in an anti-clockwise direction.
2. Models shall be either scale or semi-scale in appearance. If semi-scale, the model must have a raised cockpit or cabin and contain a dummy pilot. It must have a completely cowled engine, except for access to spark plug, glo-plug and compression adjustment. Wheels must be at least 1½ inches diameter and the undercarriage must be fixed or retractable. If of the latter type it must be lowered for each landing.
3. Maximum engine capacity 5 c.c.
4. [illegible]

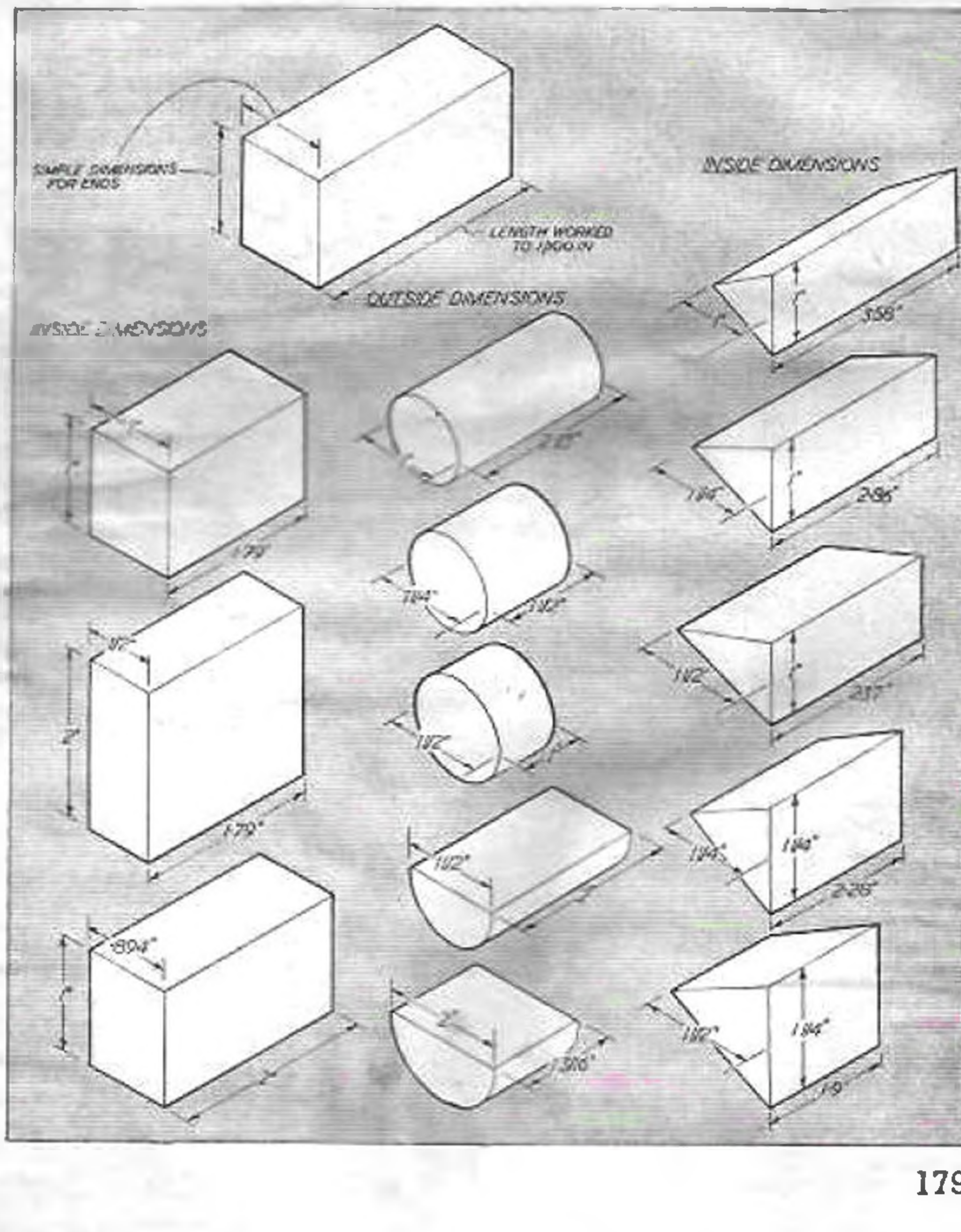
Line length from centre line of handle to centre of model to be [illegible]

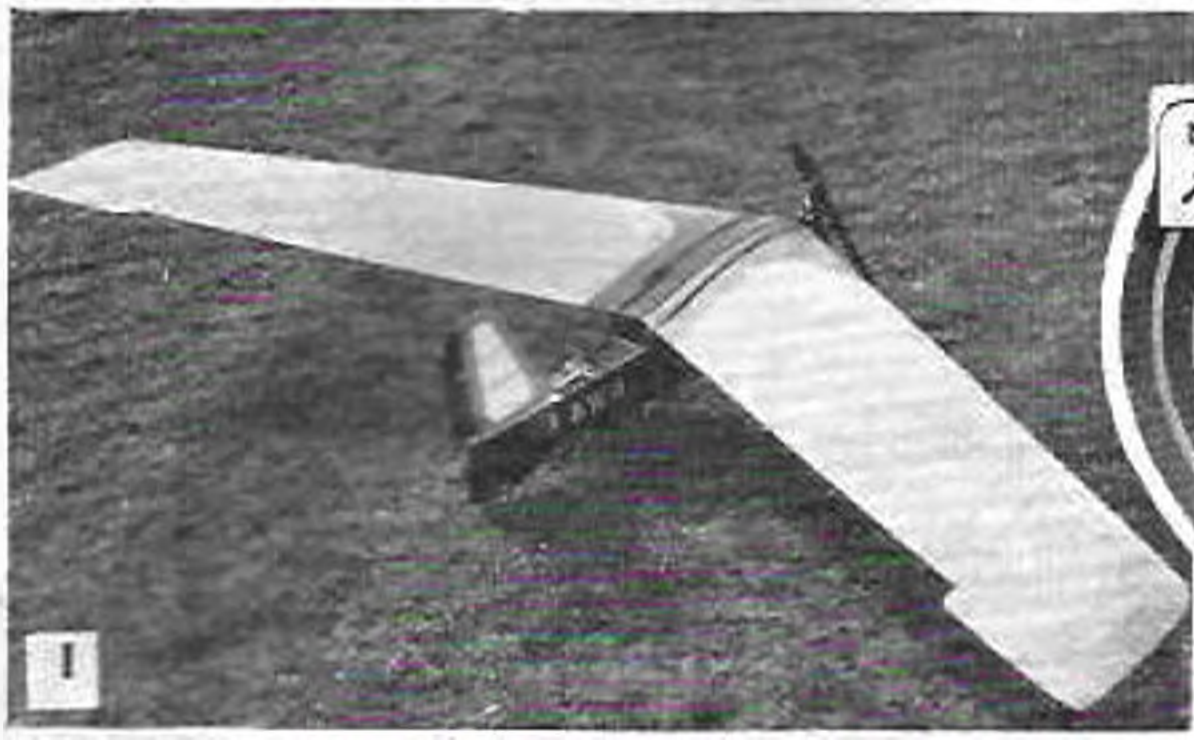
6. Maximum tank capacity (plus fuel pipe), 30 c.c. (1.83 cu. in.).

A 30 c.c. TANK is not very big! Moreover, if worked out in the standard British unit of inches it is impossible to calculate an *exact* 30 c.c. equivalent for there is no *exact* conversion. However, for all practical purposes it will be difficult enough to work to an accuracy of 1/100 of an inch and so there is no need to calculate to any greater degree of accuracy than this. Of course, you *can* measure out tank sizes in *centimetres* to simplify calculation, but nearly everyone in this country is used to *inch* units.

To get the fullest possible advantage out of the tank will call for very careful work to calculated dimensions. The onus will be on the designer for, remember, judges will not have to calculate your tank capacity to check if it is within the limit specified. All that they need do is to see if a 30 c.c. measure of liquid will fill it or not. *So if you are not sure of being able to work with absolute accuracy within calculated dimensions, work on the safe side all the time.*

The simplest way of calculating a 30 c.c. tank is to make two of the dimensions simple numbers and work the third dimension to the closest possible limits. The logical choice is simple dimensions for the ends, cutting the length to the calculated figure within 1/100 in. Here are some figures worked out for square, rectangular, round, half-round and wedge shaped tanks. Note that the *circular* and *semi-circular* tanks have been calculated to *outside* dimensions for a material thickness of 0.072 in. Any material thicker than this will be on the safe side. Wedge and rectangular tanks have been calculated to *inside* dimensions. Allowance has been made for *six inches* of 3/32 in. inside diameter fuel tubing (included in the 30 c.c. limit of the rules). The volume occupied by the vent and fuel pipes located within the tank itself should provide a slight safety margin. *Don't go and make the job more difficult by using some odd-shaped cross section but choose one of those given in the illustration below.* *And* whatever shape of tank you use, check the actual capacity against a fluid measure before finally soldering on the end, or fitting in the model.





MODEL *Aircraft* photonews

THE star model of this month's "Photonews" is by Alec. Wilson, of the Hayes Club, who knows most of the answers to tailless model problems having learnt them the hard way. Alec is an old stager at the aeromodelling game and seems to have made a habit of cleaning up the tailless contests at the Isle of Man rallies and elsewhere. The model shown is R/C—equipm[illegible]g standard E.D. Other details are: Sp[illegible]; weight (all up, 7 lb.: Ohlsson 60 engine. The wing section is particularly interesting as it employs a double under-camber and the usual reflex trailing edge. This experimental model has proved to have a very stable and consistent performance and a new version is now awaiting flight tests. This has an inverted cowled-in engine and a tricycle undercart.

Most of the old biplanes make excellent flying models and when airborne they have a realistic appearance seldom equalled by models of modern monoplanes.

At the recent Surbiton Gala, at Epsom, we spotted the free-flight Nicuport 17C shown in photograph No. 2, with its owner, R. Johnson, of Regents Park M.F.C. It was powered by a Mills 1.3 c.c. engine and performed very well.

Summer or winter, P. E. Norman can usually be found at Epsom Downs at week-ends flying his free-flight scale jobs. His models feature diesel engines of his own construction (made without a lathe!) and pendulum operated elevators which really work. Quite a personality is P.E. A sculptor by profession, in addition to aeromodelling, as a hobby he makes violins, an instrument on which he is a very accomplished performer, having won many high awards at music festivals.

Gull-winged power models are a rarity these days and our next photograph (No. 4) is of a very attractive looking example. It is called *The Loafer*,

and was designed by the well known American modeller, Frank Ehling. The model shown was made by Fairlop flyer, "Willie" Wilcox. The span is 4 ft. and the power unit a 0.75 c.c. Baby Anderson. Note the dummy cylinder head which gives a twin-engined appearance.

The very business-like looking power duration model in the next photograph is by J. Gorham, of Ipswich. It is Elfin powered and was entered in the North/South Area Keil Trophy Contest, at Fairlop last season when this picture was taken.

Reader J. Giles, of Cardiff M.A.C., took photograph No. 6, and it shows two of his fellow club members, D. Person and M. J. Bennett, getting ready to duck as an errant power model dives at the photographer—who apparently finished up flat on his back after taking the photograph and being hit by the aforesaid power job!

Wakefield expert, Bob Copland, of the Northern Heights M.F.C., tells us that he is more than satisfied with his 1950 model, and with good reason as it certainly proved in the Gutteridge Trophy Contest, that it could get up there smartly. Although in outward appearance it differs little from his earlier models it incorporates a number of new features. Bob is one of the few Wakefield designers who are sticking to parachute-type dethermalisers, the main reason being, so he says, that he has found it difficult to evolve a satisfactory method of fitting a tip-up tail to a streamliner.

Eddie Catten's 6 ft. span *Zephyr* glider design is very popular with his fellow members of the Ilford & District M.A.C., who have built six examples. Bob Amor is shown in photograph No. 8 with one of these which was lost on its first flight immediately after this photograph was taken by Edwin Stoffel.

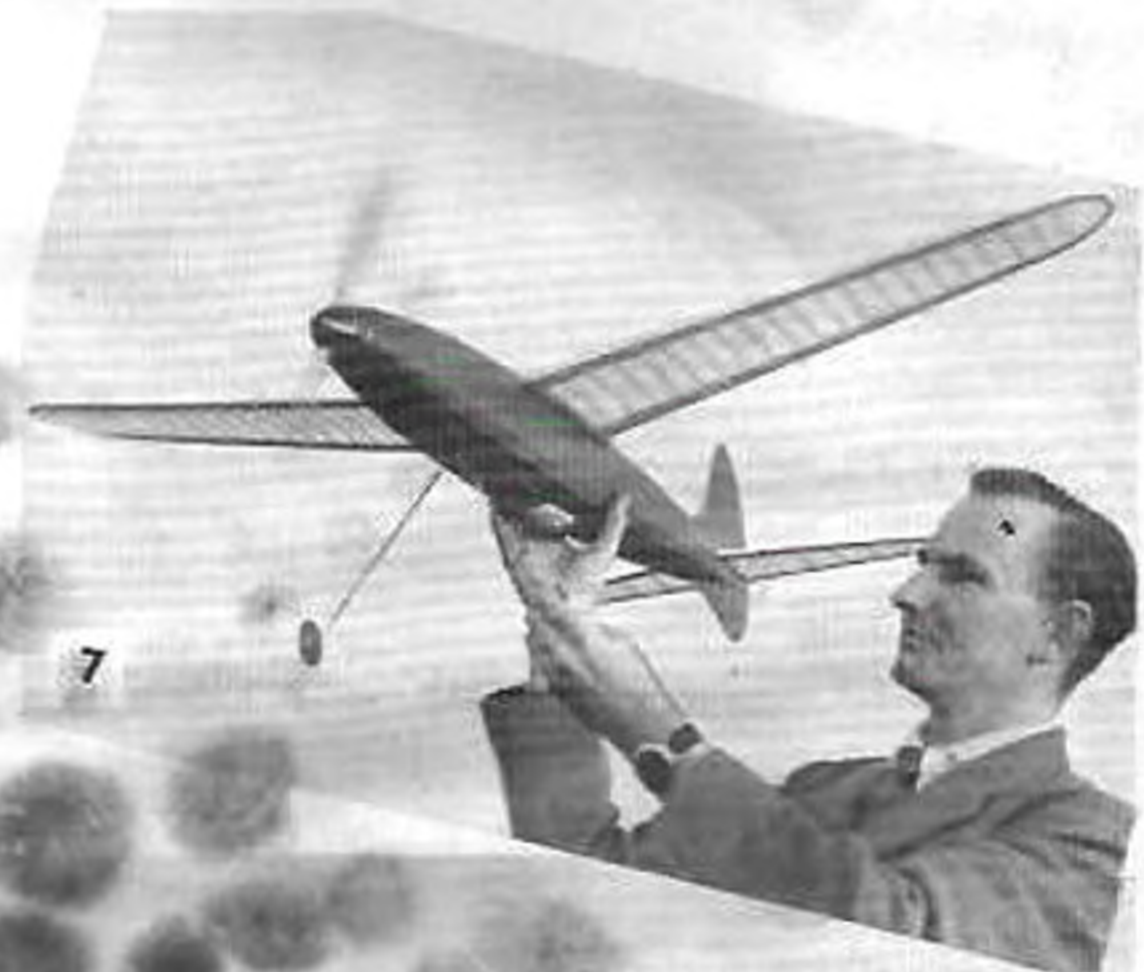
The last photograph shows V. Jays, of the Manor House Club, getting well down to it when launching his Arden powered Slicker "50" in a London Area power contest.

Thanks a lot chaps for the fine response to our appeal last month for more readers' photographs for inclusion in "Photonews"—keep it up!

Photographs which are published will be paid for, but we cannot return all prints submitted.

Here are a few tips for you budding press photographers. Remember that many otherwise good photographs are spoilt by bad arrangement of the subject—No, garden trellis does *not* make a good background! Prints should be on glossy paper and we prefer half-plate size if possible, although this is not essential. Finally, do please send full details of the subject of your photograph. Good hunting!

6



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5

CONTEST RESULTS

S.E. AREA C/L CHAMPIONSHIPS—BRIGHTON

Class I		
1. C. Shaw	Zombies	72.00 m.p.h.
2. A. R. Allbon	—	66.67 ,,
Class II		
1. D. W. Free	Surbiton	90.00 ,,
2. F. A. Wilson	Malden	82.96 ,,
Class III	(40 Flights—None Completed)	
Class IV		
1. E. Salter	E. London	66.67 ,,
Class V		
1. C. Shaw	Zombies	108.5 ,,
2. P. D. Kelsey	Cheam	106.55 ,,
Class VI		
1. N. G. Taylor	Wimbledon	132.4 ,,
2. P. W. Evans	Weston	112.5 ,,
3. N. G. Taylor	Wimbledon	110.5 ,,
Class VII		
1. R. Stovold	Guildford	143.95 ,,
2. D. Foskett	,,	125.0 ,,
Scale Speed		
1. P. Smith	Bournemouth	72.0 ,, 80 Concours Points
Scale Stunt		
1. N. J. Butcher	Croydon	
2. — Smith	Chingford	
3. — Kearney	Gravesend	
Open Stunt		
1. L. Steward	West Essex	132 points
W. H. C. Taylor	,, ,,	,, ,,
2. K. Muskett	,, ,,	
3. D. Allen	,, ,,	
Team Race		
1. Bournemouth		13½ mins. 10 mls.
2. Guildford		Not completed
3. St. Albans		,, ,,

GAMAGE CUP

1. E. Smith	Icarians	413.2
2. J. S. Richmond	Wolves	382.2
3. R. H. Warring	Zombies	253.3
4. B. G. Hope	Men of Kent	233.0
5. S. Allen	Evesham	220.8
6. J. Tangney	Croydon	212.5

(45 entries)

PILCHER CUP

1. R. Monks	Birmingham	260.0
2. J. Holt	Upton	232.8
3. L. W. Whittall	Birmingham	195.0
4. H. R. Turner	Northern Heights	168.0
5. P. North	Cardiff	160.0

(50 entries)

GUTTERIDGE TROPHY

1. R. T. Parham	Worcester	824.5
2. G. Woolls	Bristol & West	793.0
3. R. Copland	Northern Heights	767.8
4. R. Spratley	Hayes	760.5
5. J. L. Pitcher	Croydon	759.0
6. P. Gilbert	Pharos	748.3

(417 entries)

HALFAX TROPHY

1. N. G. Marcus	Croydon	639.9
2. E. Lord	Accrington	622.0
3. R. Grasmeder	West Essex	603.2
4. C. J. Davey	Blackpool	587.0
5. R. Amor	Ilford	578.0
6. P. Wyatt	Ipswich	570.0

(455 entries)

RIPMAX (RADIO CONTROL) TROPHY

1. F. H. Ashdowne	Southend Senior	300 points (Max.)
K. Honnest-Redlich	Isle of Thanet	
R. W. Birkhead	St. Georges Heights	
2. S. Allen	Battersea	210 points
3. J. A. Gorham	Ipswich	200 ,,
O. Hemsley	Bushy Park	
Hook Bros.	Zombies	
W. Taylor	West Essex	
P. Wallace	Battersea	
F. Knowles	Redhill	
4. M. A. Ayres	High Wycombe	165 ,,
J. Howard	Kentish Nomads	125 ,,

(31 entries)

Know your Engine

(Continued from page 178)

vary appreciably. Some engines, including the Eta "29" and the larger McCoys, start best with the needle-valve closed down almost to the running setting and commence fast two-stroking immediately after starting on the prime, while others, such as the small McCoy "19," start on a very wide jet opening, four-stroking slowly until the needle-valve is closed down to the optimum running setting.

Certain of the high-performance glow-plug engines not intended primarily for racing purposes can be extremely easy to start. The Arden engine has already been mentioned and another in this category is the British Yulon which is an instant starter, seldom requiring any re-adjustment to the needle-valve after a properly primed start.

Reliable operation of any model engine largely depends on intelligent handling by the user and on a systematic approach to any trouble which may arise. In the case of diesel and glow-plug engines, such troubles as are like to be encountered are mainly confined to carburation, and keeping the jet clean and using a good fuel, with the addition of a periodical check on the plug, starting-battery and leads in the case of g.p. engines will do much to ensure trouble-free operation. In the case of g.p. engines, incidentally, it is much better to have the plug wired to two conveniently placed contacts on the fuselage rather than to use a crocodile clip on the plug terminal itself. The latter procedure may cause the plug terminal to loosen under the grip of the clip and engine vibration, when starting, and may result in the element being twisted or broken. (See Fig. 4.)

In the case of the petrol-engine, the low-tension wiring can be quickly checked with the aid of a simple tester consisting of a 3.5 V flash-light bulb with suitable wire contacts. The primary winding of the coil can also be tested, opening the c.b. points and bridging the breaker terminal to earth, when a sound winding will be indicated by the bulb lighting up. To check the secondary winding, the H.T. lead is held about $\frac{1}{16}$ in. from the cylinder and contact alternately made and broken between the c.b. terminal end earth. If the plug is now removed, connected to the H.T. lead and laid against the cylinder, the question of whether this is at fault can be decided.

The condenser is easily checked as the possible cause of a short by means of the test bulb and, if all wiring is sound, only the contact breaker now remains as the possible cause of any trouble. This may be due to dirty points or to the points being out of adjustment and not making or breaking the circuit properly. Maximum point gap normally recommended is 0.010 in.-0.012 in., with rather closer clearances in the case of racing engines of 0.004-0.006 in.

AN IMPROVED BALLOON TANK

IT seems to be agreed, among stunt enthusiasts who have tried the balloon tank, that this simple device is quite the most effective means of ensuring a constant fuel feed yet introduced.

Devised by C/L pioneer Jim Walker, the balloon tank was first described to British modellers in the January, 1940, issue of MODEL AIRCRAFT. It is the only form of tank which, properly used, positively eliminates the possibility of bubbles in the fuel feed and the misfiring or cutting-out of the engine which this causes. Unlike the normal rigid tank, which must have a vent pipe to permit the entry of air to replace the used fuel, the balloon tank collapses as the fuel is used up. The worst that can happen is that the collapsed material might cover the end of the feed tube but this risk is minimised by notching the tube and such troubles seldom seem to arise in practice.

The only criticism which appears to have been levelled against the balloon tank is the fact that refilling is complicated and messy since it entails removal of the tank from the model and great care must be exercised to squeeze out all the air in the tank via the feed tube. The modified system described here eliminates these difficulties.

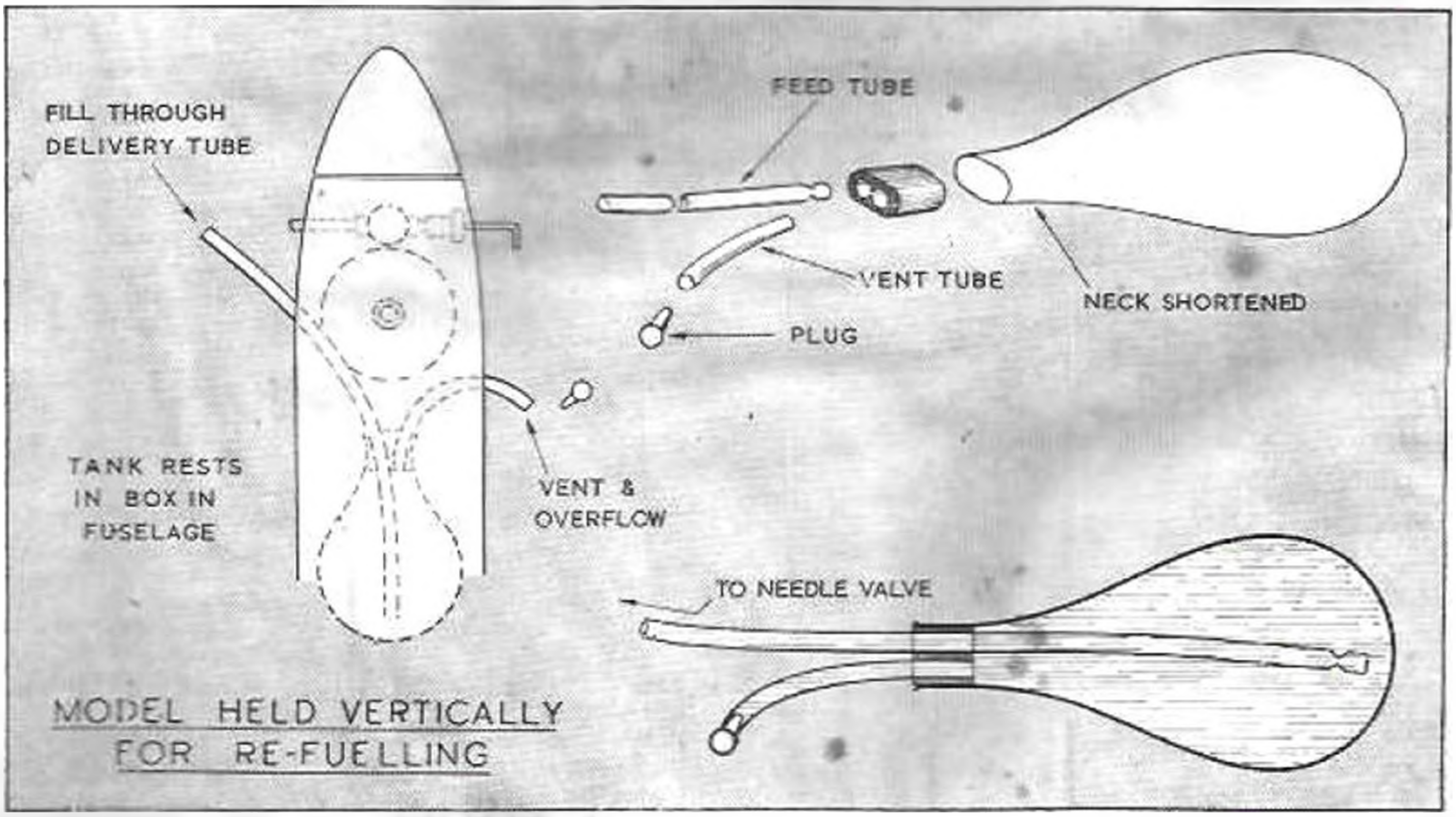
In addition to an ordinary balloon and Neoprene tubing, all that is required is about ½ in. of twin core rubber-covered electric cable, an extra piece of Neoprene and a simple plug for the latter.

The two wires, complete with their individual rubber covering, are drawn from the cable and Neoprene feed and vent pipes inserted in their place, as shown in the illustration below. Note that the vent tube is cut off flush inside the tank. The balloon is then bound firmly on with thread and, to test for leaks, it should be possible to blow up the balloon through the delivery tube with the vent plug in place.

The tank may now be fitted to the model, leaving access only to the feed and vent tubes. To re-fuel, the model is held vertically and filled through the feed pipe. With the plug removed, any air then escapes via the vent tube. When the fuel overflows from the vent, and the feed pipe is full, the former is plugged and the latter fitted to the needle-valve.

It is important to remember that, if an oil-can filler, such as a "Valvespout," is used, a certain amount of air is bound to be injected with the fuel. The overflow must then be allowed to run until no more bubbles are observed. A container placed under the vent tube will eliminate wastage and mess.

Balloon tanks are ideal for use with the glow-plug engines currently favoured for stunt work, such as the Yulon, using methanol/castor base fuels. Most diesel fuels, however, quickly cause the rubber components to deteriorate and frequent inspection and replacement are then necessary.



Correspondence

- *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*

"SCHNOZZLE" ENTERS THE FRAY!

DEAR SIR,—*Re* Bill Dean's discourse on team racing in "Power Talk" in the May issue of MODEL AIRCRAFT.

Bill asks: "Is the 'fully-cowled engine' rule really necessary?" and puts forward an alternative that "Engine must be fully cowled or sidemounted." I have always understood that team racers should be scale or semi-scale, and if a cylinder, whether it be upwards, downwards or sideways, is sticking out like Jimmy Durante's nose then it can hardly be scale or semi-scale.

I agree with Bill that there should be a Junior Team Race for engines of up to 2 c.c. and, say, using 15 c.c. or 1 cu. in. tanks, carrying 60 or 75 sq. in. of wing area, and flying on 42-ft. lines.

I like this additional junior class far better than another suggestion of 25 sq. in. of wing area per c.c. engine capacity. As the S.M.A.E. T.R. rules stand at present, what the large engines gain in speed over the smaller engines, they lose on fuel consumption, and vice versa; so that the whole thing evens itself out reasonably well. If a "25 sq. in. per c.c." rule were adopted, it would bring the speed of the smaller engined airplanes up to near that of the large engined jobs yet give them a quite unfair advantage in consumption. In any case such a rule is inadequate on a further score for it would exclude the smaller engines (up to 2 c.c.) just about completely, since it would be difficult to fly such airplanes on 52½ ft. lines.

Yours faithfully,

St. Albans, Herts. E. J. BUXTON.

CLUB REPORTS

DEAR SIR,—With reference to the recent correspondence concerning club reports, may I make some suggestions.

Ever since the early days of organised aeromodelling the problem of publicity and club reports has exercised the wits and attention of both editors and club secretaries.

The Editor of a National Monthly is looking for *real* news, and what was news in 1911 is commonplace today. No longer is a reader in the provinces interested to know that a new member of a London club actually made his first model take off un-assisted! No longer is he thrilled to know that the Slocum-on-Mud M.A.C. held its annual bun fight, and that Bill Bloggs took most of the prizes.

On the one hand the secretary of the typical model club is seeking publicity and new members for his club, and a club news report seems the right approach. Unfortunately, club secretaries are not all gifted writers, and so a sketchy report, or no report at all, results.

On the other hand, a few club reporters, P.R.O.'s, or what have you, dash off a few thousand words with perhaps a few interesting lines tucked away which are, at great pains, selected for publication by the Editor, who then gets a stinking letter from the sender complaining that his news has been slashed.

In a great many cases no club report is published because none is sent in and then the members condemn the periodical for lack of publicity, not knowing the facts.

I'm all for publicity for all clubs, but not wasteful or dull publicity at the expense of the readers, so I am suggesting that perhaps a solution could be found by MODEL AIRCRAFT sending round to clubs each month a standardised form of questionnaire which could be answered by the members themselves at a club meeting and posted immediately after. No recriminations could result and the secretary or club reporter would have the minimum amount of work to do!

On receipt of the questionnaire the Editor could check through for the real news from each club and write-up the selections into a montage of items which should prove of interest to all, and the clubs which are progressive would undoubtedly reap the benefit of publicity and new members.

Now what form should the questionnaire take? Here is a suggestion:

1. Name of the club and the date.
2. Were your meetings well attended during the month ending such and such a date?
3. How many new members were enrolled?
4. Did your club hold an indoor exhibition or lecture during that month?
5. Did any special visitor or lecturer pay your club a visit?
6. Did the club or members support any National Contests and were any members placed 1st, 2nd or 3rd.
7. Are you arranging any fixture in the month after next (this to allow time for publication) which you think that our readers should try and attend?
8. Has your club any comment to make upon current affairs in the Model Aircraft Movement?
9. Has any specific member singled himself out for special attention during the month in question, i.e., Won a Contest; built an outstanding model; given an interesting talk, etc.?

Well, Mr. Editor, there it is—why not give it a trial?

Yours faithfully,

London, N.20. C. A. RIPPON.

WHY WAKEFIELDS ARE BUILT

DEAR SIR,—I would like to know how, why or when "Wakefielder" managed to deduce that the Americans were ahead of us in Wakefield design? It is obvious that with two countries so far apart that no one knows which has the best models. From recent U.S. magazines it can be seen that the Americans think our "Wakes" are superior, mainly due to Ron Warring's 4¾ min. still air claims.

Regarding kit and magazine design Wakefield models; why should these be penalised? Any regular contest flyer knows that winning a contest is about 10 per cent.

skill and [illegible] per cent. luck—sometimes 100 per cent. luck! It is not the design that matters, but the thermals. By the way, whither has the *Jaguar* flown? I did not see one at the (London Area) Gutteridge Trophy Contest.

I think that the Wakefield rules could be improved (from the duration point of view) if the F.A.I. rules were adopted—say, 300 sq. in. of wing and tail area and 8 oz. minimum weight. I feel sure also, that whatever the rules, design will *never* reach stagnation point, whilst aeromodellers exist.

I must disagree with Ron Warring's statement that Wakefields are the ultimate in aeromodelling. Heaven help us if they are!

Has "Wakefielder" ever built an indoor microfilm model, or a r.t.p. job that will do 5 min.? No thermals here! Has he completed the C/L stunt schedule?—This, too, is very exacting! Has he ever flown R/C, or a high powered free-flight gas ship successfully? Believe me, these tasks are harder than getting 3 min. out of a "Wake."

And why do people build Wakefields? I feel sure that modellers (myself included) build them more because of the incentive of a free trip to a foreign country, than for the love of it. Look at the number of Nordic A/2 gliders around, mainly because of the prospect of a trip to Sweden.

Finally, I do agree with "Wakefielder" in that it is far better to hide under the cloak of anonymity.

Yours faithfully,

Surrey. CONTEST ALL-ROUNDER.

MEET THE CONTRIBUTORS

A. W. "BILL" GARRY

Age 44. Married. G.P.O. employee. Founder member of the Brighton District M.A.C. (1932).

Commenced aeromodelling in 1917 with canard pushers.

Has held his clubs' flying scale record since 1937.

Chief interest building and flying scale model aircraft—particularly biplanes.

Dislikes control-line flying and pylon-type duration models.

Other interests: motor cycling, reading and writing.

PROCESSING DOWN UNDER

DEAR SIR,—The correspondence concerning enforcing weight rules, etc., makes me think that perhaps the method we use here in New Zealand may be of interest to you. All our classes are weight rule of sorts, (we don't seem to like lightweights), and we make the modeller solely responsible for conforming with the class rulings in this way:—Each entrant must supply a tracing of wing and cross-section (and for Wakefields, tail area). On registration, the model is simply check-weighed, that is all the processors need to do before the contest. After the contest, the place-winners only are processed, all the necessary data is readily available in the tracings and official weight. In practice the scheme works very well, with the minimum of labour by officials.

Yours faithfully,

Auckland, New Zealand. F. D. BETHWAITE.

AEROMODELLING CLASSES

DEAR SIR, With reference to the letter headed "Aeromodelling in the Doldrums," published in the May issue of the MODEL AIRCRAFT, I would like to take this opportunity to bring to the notice of readers that facilities *do* exist for young lads to receive instruction in aeromodelling at numerous L.C.C. Evening Institutes.

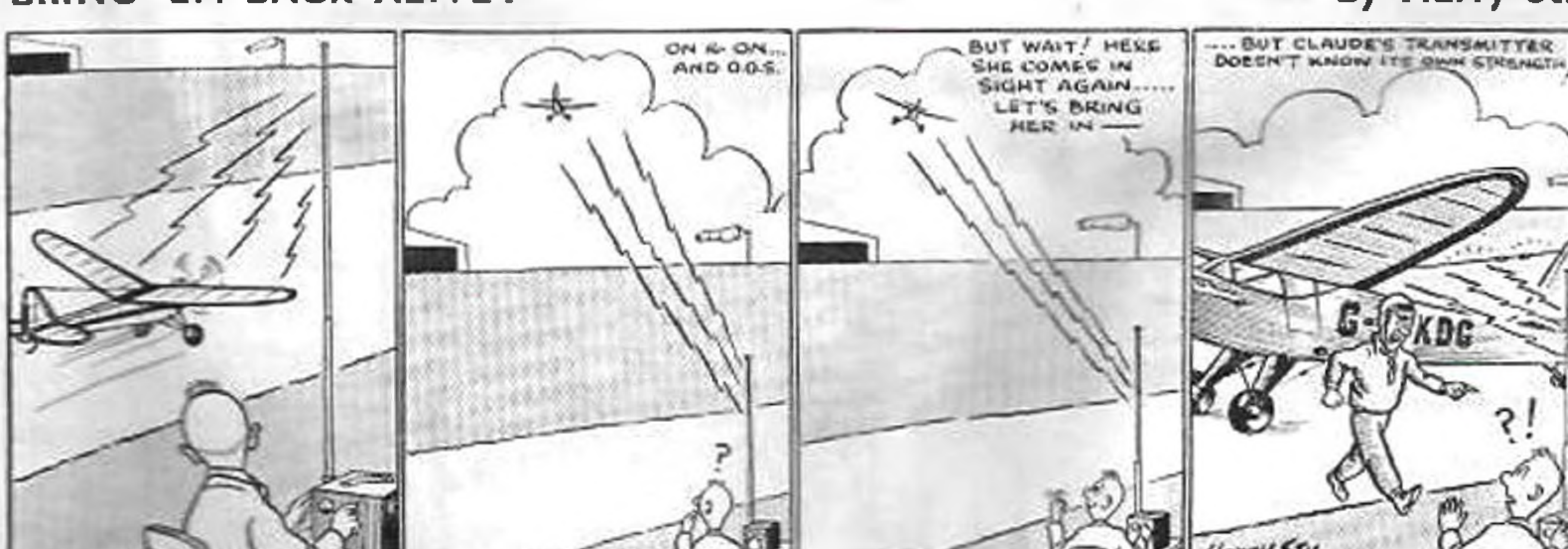
Aeromodelling as a subject was first introduced at the Dog Kennel Hill Evening Institute, where excellent facilities are available to modellers each night of the week. There is access to a large classroom suitably equipped for designing and building model aircraft, also, at the disposal of the students is a large hall for indoor flying and, of course, the playground for outdoor C/L flying. Further, the L.C.C. has now made it possible for modellers to purchase necessary materials on the premises. These facilities along with qualified instructors may be found in numerous evening institutes in the L.C.C. area.

I feel sure that many more young modellers would avail themselves of these opportunities if only they were aware of their existence.

Yours faithfully,

London, S.E.5. F. W. SPICER.

BRING 'EM BACK ALIVE! By Harry Stil



the cement dries you can ensure that the mount is properly aligned with the fin, tailplane and fuselage. Do not substitute a thicker gauge wire than that specified as it is easier to bend the mount back in the event of a severe collision with an obstacle than it is to rebuild part of the fuselage.

The covering of the fuselage will be simplified by the use of the patterns provided on the plan. The original was double-covered in Jap tissue, but a single covering of "Modelspan" or Burmese tissue will do as well and will be easier to apply.

Wing and Tail

The leading and trailing edges are laminated to reduce the locked-up stresses in the structure and to minimise warping. The use of sliced ribs is justified by the ease of allowing for the taper by cutting from the trailing edge. The wing section is suitable for this method and in conjunction with tapering the leading edge as shown on the plan, a good aerofoil section is maintained to the tips. It is only too easy to distort the aerofoil shape by jamming in the ribs and bowing them; this must be avoided and the ribs cut exactly to the lengths required. The strengthening of the ribs at the dihedral breaks is most necessary since the shape tends to distort at these points.

Fin

The fin should be well built of hard wood so that it will not warp; the covering should not be shrunk with water or dope. It will be noticed that the fin is large; this is demanded by the large propeller and dihedral angles, but you won't need any additional fins above or below the tailplane.

Propeller

This is the most difficult part of the model to make because it demands a high standard of workmanship. The performance of the model will depend very largely on the efficiency of this unit and there is no point in streamlining the model if the propeller is inefficient and wasting energy.

The first requirement is a fairly hard straight-grained block carved in the correct manner with quarter-grain on both blades. This can only be done by cutting the blocks separately, as shown on the plan. Check for quarter-grain by chipping the corners of the blocks. The blades should be thin with about 3/32 in. undercamber at the widest point; the lower surface must be carved first in order to preserve the designed blade angles, the upper surface being cut down to it after cutting back the root. This produces a characteristic curl in the trailing edge of the blade near the root. The hub and blade roots should be finished together to get a shake-free fit. The blades should fold stiffly on the test flights and the mating parts should be heavily doped to prevent swelling in wet weather. Drill the holes for the hinges with the blades in the extended position. Since the spinner takes all the knocks in collisions with obstacles and landings on the chute it should be well made; the same applies to the nose-block, bearings and tension stop, all of which will contribute to poor results if there is sloppiness or shake.

Power

Use 10-12 strands of Dunlop ¼ in. = 1/24 in. weighing 2½ oz. You will find that the performance is distinctly better with the higher power, and the motor run in flight, fully wound, should be 60-70 sec. Should you build the model heavier than the weights indicated below the number of strands must be increased in proportion.

Flying

The original model circled right and you will find that a tight circle in the glide will be of great assistance in checking any tendency to stall due to poor trim. If you have not flown a model with a large double-bladed folding propeller before it should be noted that there is a considerable change in the C.G. position when the propeller folds and there is little latitude in the wing position for the glide. It is as well to have the wing too far back, if anything, on the initial flights.

Use whatever dethermaliser system you prefer. I use a large paper 'chute attached to the rear of the fuselage so that it will bring the model down vertically. I have never had anything broken by such a descent, but on the other hand I have often seen models fly away with a small 'chute trailing behind!

Weights

Wing	0.6	ounces
Fuselage	1.6	,,
Tail	0.2	,,
Propeller and Noseblock	1.1	,,
	3.5	
Motor	2.5	,,
Total weight	6.0	,,

This loading is just under the 1949 F.A.I. minimum, but stronger spars, heavier stringers, and so on, with an increase in rubber weight would bring it within the formula if required.

THE DESIGNER . . .

R. J. North . . . Age 28 . . . Single . . . Experimental Officer, Aerodynamics Division, National Physical Laboratory . . . . Spent war in R.A.F. on ground control radar . . . Started modelling in 1934 . . . Member of Croydon & District M.A.C. . . . Builds all types—even control-line—and currently interested in Wakefields and free-flight power . . . Regards aeromodelling purely as a sport . . . Thinks contest rules should be simpler and dislikes weight rules . . . Strongly approves of the 5 minute rule . . . Can't understand why models should be expected to look like full size planes . . . Regrets the low standard of aerodynamic knowledge of model experts—especially those who write for magazines!

S.M.A.E News

REPORT OF S.M.A.E. COUNCIL MEETING HELD AT LONDONDERRY HOUSE, PARK LANE, LONDON, W1., ON SATURDAY, APRIL 22nd, 1950, AT 2.30 p.m.

The following were present : Messrs. R. F. L. Gosling (Chairman in the absence of Mr. A. F. Houlberg who arrived later), D. A. Gordon, H. W. Barker, H. R. Turner, C. S. Rushbrooke, E. F. H. Cosh (London Area), B. A. Messom (Northern), D. Salisbury (North Western), W. W. Lowery (South Wales Area), J. S. Bishop (Western Area), H. G. Hundleby (South Midland), R. C. F. Day (Southern Area), G. F. Foden (East Anglian Area), F. A. Mason (Midland Area), D. F. Scuffham (Royal Aero Club).

Correspondence

The attention of the Council was drawn to an offer which had been made in circulars and advertisements to provide a recovery service. It was decided to advise the affiliated clubs that such a service was already provided by the S.M.A.E. Registration Scheme.

A letter from the Secretary of the Federation of Model Aeronautical Manufacturers and Wholesalers was read in which it was suggested that the Federation be advised in future of any alterations to rules, particularly those relating to the specifications of contest models in order that this information could be circulated simultaneously to all kit manufacturers. This suggestion was agreed to.

An invitation to send a British team to compete in the Irish Nationals on July 8th and 9th was discussed and it was decided that in view of the Society's commitments in connection with the Wakefield and Nordic Contests, it would not be possible to support this event officially. Individuals who intend to go to Ireland for this event are requested to advise the S.M.A.E. in order that they can be officially entered.

Correspondence was read from the South African M.A.A. concerning the return of their 1949 Wakefield models by B.O.A.C. at a cost of £45. It had apparently been intended that these should have been returned by sea at a much lower frieght charge, but the Society had not been informed of this fact. As the payment of the charge had placed the S.A.M.A.A. in financial difficulties, the Council decided to meet half the cost.

A letter from the Kentish Nomads Club drew attention to the fact that the certificates for the 1948-49 Wakefield "100" had not been awarded and at the request of the Council, Mr. E. F. H. Cosh agreed to prepare a suitable design.

The Chairman read a letter which he had received from the Secretary of the Radio Controlled Models Society, in which it was suggested that this Society should be represented on the S.M.A.E. Radio Control Sub-Committee. Mr. Houlberg was instructed to reply that the Council were not prepared to accede to this request.

Finance

The Treasurer, Mr. H. W. Barker, presented his report which showed a balance of cash in hand of £757 15s. 5d.

Wakefield Contest

Following suggested amendments to rules which had been submitted by the Finnish Aeronautical Association were discussed.

(1) That the maximum flight time be extended to six minutes. This was *not* agreed to.

(2) That repairs or test flights may only be made in an area specified by the Judges. Agreed.

(3) That the winning models be re-checked after the contest. Agreed.

Final Wakefield Trials

Arrangements for holding these at Kidlington or Wittering Aerodromes having broken down, it was decided to hold the trials at Fairlop Aerodrome.

1951 Competition Programme

It was decided that at the next Council Meeting the proposals received from the areas would be collated and then circulated to the clubs in the form of a questionnaire.

Records

The Council decided to institute a new record class for A/2 Gliders H.L. and T.L. The following records were ratified : Indoor, Tailless R.O.G., M. R. Thomas (Oldham & D.M.A.C.) 1 min. 46.2 sec ; Indoor, Helicopter R.O.G., S. A. Ward (Wolves M.A.C.) 2 min. 00 secs ; Indoor, Fuselage R.O.G., R. T. Parham, (Worcester M.A.C.) 6 min. 42 secs ; Indoor, Fuselage H.L., R. T. Parham, (Worcester M.A.C.) 6 min. 55 secs ; Indoor, R.T.P. Speed, T. A. Jolley, (Warrington M.F.C.), [illegible] m.p.h. ; Outdoor, Lightweight Glider, M. L. Hanson, (Solihull M.F.C.) 10 min. 30 secs.

The following record applications were recorded : Outdoor, Power Class "C", D. S. Lund, (Wakefield M.F.C.), 6 min. 46 secs. ; Outdoor, C/L Speed Class VI, N. C. Taylor (Wimbledon Power) 132.4 m.p.h. ; Outdoor, A/2 Glider T.L., J. Truscott, (Belfairs M.A.C.) 6 min. 25 secs. An application for an Outdoor C/L Speed Class 2 record of 90 m.p.h. by D. W. Free (Surbiton & D.M.F.C.) was rejected as the engine used had not been impounded for checking purposes after the flight.

Merit Certificates

These were awarded to the following : Class A, No. 351, Kay, F. A. (Rochdale), 352, Fitton, H. G. (Rochdale), 353, Deakin, J. (Evesham), 354, Ramsden, E. (Wakefield), 355 Rushton, W. (Burnley), 356, Grimes, Patricia (Burnley), 357, Grimes, J. (Burnley), 358, Smith, A. S. (Regents Park), 359, Richmond, J. S. (Wolves).

Applications for Affiliation

Applications from the following clubs were accepted :

Whittlesey M.A.C., Seniors 12, fee 30s. Hogsthorpe & District M.A.C., Seniors 6, Juniors 9, fee 24s. Spalding & District M.A.C. Seniors 19, Juniors 6, fee 53s. 6d. The North London Society of M.E. (Aero Section), Seniors 10, fee 25s. Redhill, Reigate & District M.F.C., Seniors 10, fee 25s. Wimbledon Power M.A.C., Seniors 8, Juniors 2, fee 22s. Victoria M.F.C., Seniors 11, fee 27s. 6d. Chilwell Zenith M.A.C., Seniors 3, Juniors 9, fee 21s. South Bradford M.A.C., Seniors 8, Juniors 10, fee 30s. Malton, Norton & District M.A.C., Seniors 11, fee 27s. 6d. The Aberdeen & District M.F.C., Seniors 19, Juniors 23, fee 70s 6d. Crewe & District M.F.C., Seniors 15, Juniors 21, fee 58s 6d. Fylde Coast M.A.C., Seniors 12, Juniors 8, fee 38s. Horwich M.A.C., Seniors 13, Juniors 7, fee 39s. 6d. North Manchester M.A.C., Seniors 13, Juniors 3, fee 35s. 6d. The Skyscrapers (Rossendale) M.F.C., Seniors 12, Juniors 1, fee 31s. Southport M. & E.C., Seniors 20, Juniors, 11, fee 61s. Stockport M.A.C., Seniors 9, Juniors 1, fee 23s. 6d. Median Model Club (Newport & Carisbrooke), Seniors 14, Juniors 12, fee 47s. Stafford & District M.A.C., Seniors 7, fee 25s. Westfield & District M.F.C., Seniors 7, Juniors 5, fee 22s. 6d. Dover & District M.F.C., Seniors 12, Juniors 6, fee 36s. Seaford & District M.C., Seniors 10, fee 25s. Hawkhurst & District M.C., Seniors 11, Juniors 2, fee 29s. 6d. Men of Kent (Maidstone) Aeromodellers, Seniors 7, Juniors 4, fee 21s. 6d. Lanark M.F.C., Seniors 9, Juniors 1, fee. 32s. 6d. The College of Aeronautics M.A.C., Seniors 15, fee, 24s. Aylesbury M.F.C., Seniors 8, Juniors 4, fee 24s. Teignmouth M.C., Seniors 6, Juniors 9, fee 24s. Bargoed & District Eagle F.C., Seniors 7, Juniors 4, fee 21s. 6d. Tewkesbury & District M.A.C., Seniors 16, Juniors 5, fee 45s. Short Bros. & Harland Ltd., M.E.S., Seniors 10, fee 25s.

1950 Contests

Competition Secretary, Mr. H. T. [illegible], requested Area Delegates to draw the attention of their clubs to the fact that in this year's contests, the rule requiring the inspection of insurance certificates before the acceptance of entries in S.M.A.E. Power Contests *must* be applied in all cases. He also stated that it was intended to rigidly enforce the closing date for the receipt of entries in Area Centralised and decentralised contests.

Annual Dinner and Prize Giving

It was considered that last year's experiment of holding a buffet supper and dance had not been entirely successful and it was decided to hold a dinner and dance in London on Saturday, November 4th, 1950, the day prior to the A.G.M.

The meeting terminated at 8 p.m. with a vote of thanks to the Chair.

NEWS *from* the CLUBS

WESTERN AREA COMMITTEE

At last, after many setbacks, the area is once again on its feet. On March 11th, Mr. Houlberg, took the chair at the E.G.M. held at Bath. Mr. G. Woods (Bristol and West M.A.C.) gave a report on the activities of the caretaker committee, which had temporarily taken over the reins.

The following were elected as officers:—Chairman, Mr. Pocock (Trowbridge & District M.A.C.); Vice-chairman, Mr. Walters (Bristol & West M.A.C.); Secretary Mr. G. Woods (Bristol & West M.A.C.); Comp. Secretary: Mr. H. Middleton (Bristol & West M.A.C.); Treasurer and Insurance: Mr. T. Nutt (South Bristol M.A.C.); P.R.O.: Mr. K. Farmer (South Bristol M.A.C.) Area Delegate: Mr. Bishop (Glevum M.A.C., Glos.).

It was decided that the following rallies should be held, subject to the venues mentioned being available:—

Spring Rally—Yeovilton Aerodrome, Yeovil.
Summer Rally—Lulsgate Aerodrome, Bristol.
Autumn Rally—Swindon.

The C/L Contest venue is not yet decided.

NORTHERN HEIGHTS M.F.C.

As part of the publicity drive recently undertaken by the N.H.M.F.C., which includes the display of attractive showcards in local shops, the club participated in an exhibition of model aircraft at a North London Odeon cinema, during the showing of the film "12 o'clock High."

Organisation of the N.H. 1950 gala is proceeding, and the programme will include contests for open rubber, open glider, open power duration, C/L stunt, helicopter trophy and, of course the Queen's Cup, for which the rules remain the same as last year.

Details can be obtained from the hon. sec.: A. G. Bell, 70, Nelson Road, Hornsey, N.8. (Phone: MOU 7322).

Make a date to meet all your friends at the H.N. gala, at Langley Airfield, Nr. Slough, on July 2nd, 1950.

HUDDERSFIELD AIR LEAGUE M.A.C.

Membership is now approximately 70, and the club is more active than ever before. Thanks for this happy state of affairs are mainly due to a decision taken at the last A.G.M., which has eliminated the "off the record" grumbling which undermines many clubs, and which caused us some concern last year.

The idea is quite a simple one and has resulted in what we call "Grumble Night," which is the name given to the club night before each monthly committee meeting. These meetings take the form of an open forum under the chairman, where members air their views and grievances quite freely with "no holds barred." Each subject is thrashed out in general terms, and the secretary makes notes for the committee to work out details at their meeting.

At first the grumbles were many and varied, but now we get no more than an odd one or two at the most, which is a pleasant state of affairs, particularly for the committee! More important though, it gives the ordinary member a sense of importance, in that he is helping to run the club.

At last members are showing signs of becoming "competition minded," someone may yet figure in the prize lists! We're living in hopes anyway.

LUTON AND DISTRICT M.A.S.

The club held their exhibition last month and a fine selection of models was on show. The *Prix d'Elegance* was won by Mr. Yeo's high wing cabin job, powered by an E.D. Comp. Special, and nicely finished in blue and white. The winner of the flying scale class was Brice Mander's 45 in. Miles Sparrowhawk. This model is unique in that it is entirely covered with sheet (1/16 in. on fuselage, 1/32 in. on wings). Full marks must go to our friend, Mr. S. Miller, for the working model of a R/C rudder layout, hand operated from an ordinary switch.

LIVERPOOL M.A.S.

The President's Trophy this year will be awarded on the following basis: three competitions to be nominated by each member within the outdoor season, which must contain two different types, i.e., two rubber and one glider, two glider and one power, or any other combination. Points for each competition will be awarded thus:— "A" cert., 50—max. for three flights 450 (three flights 2½ min.); design, 30 own design, 20 club or plan design, 0 for a kit. Model in flying condition after three flights, 100; model retrieved after each flight, 50 (max. 150). Handicap, 1st year junior, 100; 1st year senior, 50, juniors, 50, others 0. Max. points for three competitions = [illegible].

PARK M.A.L.

The club has now finally emerged from its semi-hibernation during the winter, the main activity appearing to have been the purchasing of motor-cycles. But two new Wakefield designs have been evolved, built and flown, and the Nordic gliders are showing great promise.

Mr. Briggs has now nearly finished his four-engined C/L scale "Lancaster," which he started building in the dim past. More will be heard of this model, which promises to be a worthy successor to his previous scale models. He now threatens to start building a "Fortress" . . . well, "An Englishman's home. . . ."

● The club turned out in force for the Surbiton Glider Gala, the club winning the team trophy for the second year running, despite the loss of a number of models, most of which have since been retrieved.

SUNDERLAND & DISTRICT M.A.C.

Following affiliation to the S.M.A.E. the club has now received Air Ministry approval for the use of the nearby R.A.F. airfield at Usworth. Free flight is allowed after the daily work of the station is ended, and a hangar is available for indoor C/L flying at week-ends. These facilities are open to club members only. The loss of the club field last year broke up organised club flying, but it is hoped that now the club will be able to get together again. Although hibernating in the main, some stalwarts kept up regular C/L sessions in various local quarries throughout the winter, while free flight was not entirely unknown!

The first contest scheduled is for the Potts' Cup, awarded this year for F.A.I. gliders, to be flown off at Usworth on Sunday, May 21st, 1950. A decent turn-out for this event has been promised, *Gilli-choppers* being the favourites at present. R/C has reached us in the shape of a *Falcon* and a modified *Ethereal Lady*, built by F. Smith, while three or four other members are known to be plotting in secret.

WEST ESSEX AEROMODELLERS

We start the season with a continental flavour, for a contest with Aero Club di Roma, on April 23rd, with two Wakefield models and two gliders. Results and photographs of both teams will be exchanged.

Annual club records, A. W. Green (Wakefield), 6 min. 20 sec. H/L. C. Mayes, open glider, 10 min. 47.8 sec.

Arrangements for a coach to Odiham are well supported. The wielders of the micro-switch ("clonk, clonk") are on the increase, amounting to eight active members ("on and off"). Our 1950 gala programme for June 18th, is complete and no member of the club will take part in any of the gala events. They all will be working (we hope!)

SWANSEA AEROMODELLERS CLUB

The editorial in the February issue of MODEL AIRCRAFT, regarding winter activities, impels us to write you. Perhaps our publicity department isn't working overtime, but the committee of this club sees that during the winter everyone is catered for and every endeavour is made to fit both old and new members for the coming season.

Winter flying takes place on all fine Sundays and a winter competition is held in January every year. This year competitors were allowed to fly either rubber, power or glider, no handicap and the best duration was the winner. The June rally is an innovation with prizes to the value of £20. Fairwood is one of the best flying fields in the country. Any club which comes to any rally at Fairwood will be amply repaid with a good day's sport.

A group of happy-looking members of The Swansea Aeromodellers Club at their annual prize-giving dinner

HULL "PEGASUS" M.F.C.

The club is very active, and R/C, Wakefield, and "A2" glider events will see us participating. Having recently re-gained the R.A.F. Leconfield drome for use by members, some improvement in flying has already been noticed. The C/L boys are holding their end up by giving occasional displays to the crowds at Hull City A.F.C. home matches and do the crowd love it? I'll say. I should stress that "own design" is quite usual in this club, in all branches, from R/C (plane and set) to "A2" glider and not too much to the rear is canard rubber.

SURBITON & DISTRICT M.F.C.

We had a very interesting lecture in February, given by Mr. G. H. Redlich, on three channel R/C, complete with working models, which the radio boys played with after the lecture. Mr. Redlich also gave us some useful gen on the successful operation of thyratron type equipment.

Our annual glider gala was held on March 26th, on Epsom Downs, bringing forth the glider fans with their latest creations dreamed up during the winter. Total entry of 252 was received and the weather was sunny though rather windy, resulting in some good flights and a host of lost models. Organisation worked very smoothly and no timekeeping hold-ups occurred.

ST. ALBANS M.A.C.

The new date for this year's All Herts Rally is July 23rd.

Rubber, glider and free flight power rules stay as last year, with one alteration for rubber and free flight—models may be hand-launched or r.o.g. as the competitor desires.

The *Concours d'Elegance* is divided into three classes: (1) rubber and glider models; (2) free flight power; (3) control lines.

In the C/L sphere we are working completely to S.M.A.E. classes and rules in all three events, speed, stunt and team racing. This will avoid any unfortunate snags which arise when a competitor wishes to claim a British record.

Total prize money for this year's rally is £45, ten quid up on last year! So roll up.

We would just point out that in the team racing event there are two additions to S.M.A.E. rules.

(1) A closed eye tail hook for use with automatic stooge take-off gadget.

(2) An engine cut-out device (any sort) capable of being operated by the pilot.

We have had two interesting lectures recently; the first was by Group Captain Donaldson, on "High Speed Flying," and the second by Reginald Denny, on "Radio Control."

Our class of youngsters on Friday nights has been coming along quite well. The age range is ten to fourteen. As they become good modellers we hope to bring them in the club as junior members; we only have two or three in that category now! The class consists of 20 members, who are building a rubber model and a glider!

BRISTOL AND WEST M.A.C.

Indoor meetings are progressing well, and there is a good attendance.

The club has been fortunate in securing the use of Lulsgate Aerodrome, just outside Bristol, together with one of the buildings.

It is hoped to hold informal competitions on Durdham Downs in the light evenings, and these will probably be open to non-members.

Progress is being made in R/C, and it is hoped to have several models flying soon.

PRESTWICH M.A.S.

During the past month some good flying has been done in spite of the bad weather. Two models were lost, both lightweight rubber jobs, one was a *Ruff V*, belonging to S. P. Targett, which went o.o.s. in 25.00, the other belonging to D. Bennett, clocked 10.20 o.o.s. and was picked up 14 miles away. During the week preceding the "Gamage," three models were lost, D. R. Criddle lost his Mills powered model for 4 min., and S. R. Targett lost his Arden 0.099 powered *Baby Climer*, for 8.00, any news of these two models would be very welcome, also C. Hargreaves lost his *Gillichopper* for 1.37 in a high wind. It was found impossible to fly in the Gamage Cup, due to a 50 m.p.h. gale.

ROCHDALE & DISTRICT M.F.C.

Though the above club has been formed since 1946 little has been done that could be considered of outstanding interest to outsiders until this year, when we elected an almost entirely new committee and our present secretary—now things *are* humming. Since the year began we have persuaded Mr. T. Dunkerly, of King's Cup Air Race fame, to become our first president.

An exhibition was held at the commencement of the flying season of upwards of 50 models and prizes included joy flights with the president.

A strong tendency can be seen following some rather spectacular flying with a large and very heavy glider at the end of last season in that direction with the development of R/C for these models.

The club has an excellent flying field at Lobden Moor, *but* permission must be sought by the club for its use before each contest or flying day, so whilst neighbouring clubs are welcome they *must* write for permission 14 days beforehand, in case of a refusal.

Wishing you all the best with our favourite journal.

CONTEST CALENDAR

June	25th	**Hamley Trophy.** Power Duration. D.C.
July	2nd	Northern Heights Gala, Langley, Bucks.
,,	9th	**Control-line Stunt and Speed.** Area.
,,	16th	Sevenoaks Gala Day, Dunton Green, Kent.
,,	23rd	**Wakefield Trophy—Finland.**
,,	23rd	All-Herts Rally, Radlet, Herts.
,,	30th	**A 2 Glider Contest—Sweden.**
Aug.	6th	Bolton M.A.S. Rally, Affetside.
,,	6th	**Bowden Trophy.** Power Precision.
	&	**Taplin Trophy.** Radio Control.
	7th	**Control-line Speed.** Centralised—venue to be announced.
,,	13th	South Coast Gala, Brighton.
,,	15th-25th	Eaton Bray Rally.
,,	27th	Huddersfield Air League M.A.C. Rally.
,,	27th	Merseyside M.A.C. Slope Soaring Meeting, Clwyd Hills, N. Wales.
Sept.	3rd	**AREA AUTUMN RALLY**
		Farrow Shield. Unres. Team Rubber.
		"Model Engineer" Cup. Unres. Team Glider.
		Astral Trophy. Power Ratio.
,,	17th	**S.M.A.E. Cup.** Open Glider. D.C.
,,	17th	**"Flight" Cup.** Open Rubber. D.C.
,,	17th	**Frog Junior Cup.** Open Rubber. D.C.
,,	17th	Portsmouth and District M.A.C., Southern Counties Rally, Thorney Island, Hants.

S.M.A.E. CONTESTS IN BOLD TYPE

BY-PASS (SUTTON) MODELLERS

We opened the flying season this year with a competition against Ewell M.A.C., in which we managed to win the rubber, and power events, and the Ewell lads won the glider. The best flight of the day was made by C. Clarke (By-Pass), who achieved a ratio of 37.5 : 1, with his Frog "500" powered pylon. This is a new club record.

ICARIANS M.F.C.

Those lightweight rubber addicts who, towards the end of last season, deserted the cause, and went over to Wakefields, have, it appears, returned to the paddle-prop fraternity. Indeed, one worthy has already installed an E.D. Bee in the nose of his *Gypsy*, the results of which have been amazing, if not wholly successful!

In the free-flight power field, promise is coming from the building board of Bill Syrett, who has just completed an Amco 3.5 powered *Flanders Flyer*, which, when trimmed, should be quite formidable. A Frog 100 powered *Bandit* has also been going through its paces recently, logging decent ratios. Another project which has not yet reached the building stage, but should be good, is an Elfin 1.8 powered six-foot lightweight. A similar model by the same designer, powered with a Frog "100" was extremely consistent last season. To complete the scene is a *Powerhouse* 33, sporting an E.D. Bee, which has a terrific rate of climb.

The circular-minded types have been hard at it and one of the best looking stunt jobs we have seen is John Coasby's latest effort, a 6 ft. span, fully streamlined McCoy 60 powered ship. This took two months to build, has elliptical section planked fuselage with bubble canopy, dihedralled wings with straight L.E. and elliptical T.E., fully faired and elliptical built-up tail unit, and the under-carriage is of the scale type, fixed to the wings, and knocks off with the wings in the event of a crash, the wing bands take the landing loads.

Sailplane enthusiasts are also at work, on A/2's, and the usual monster-lightweights, as well as some six and seven footers, both light and medium weight.

DURHAM CITY M.F.C.

We regret to report that our secretary, Kenneth J. Warriner, died on Wednesday, March 29th, after a sudden illness.

He was one of the founder members of the club.

His death was a shock to all of us. It has been requested that his models be entered and flown in the competitions for which he intended them, by his friend, A. I. Nunn. A trophy will be given by our chairman, Mr. I. Applegarth, to be known as the Warriner Trophy, in his memory.

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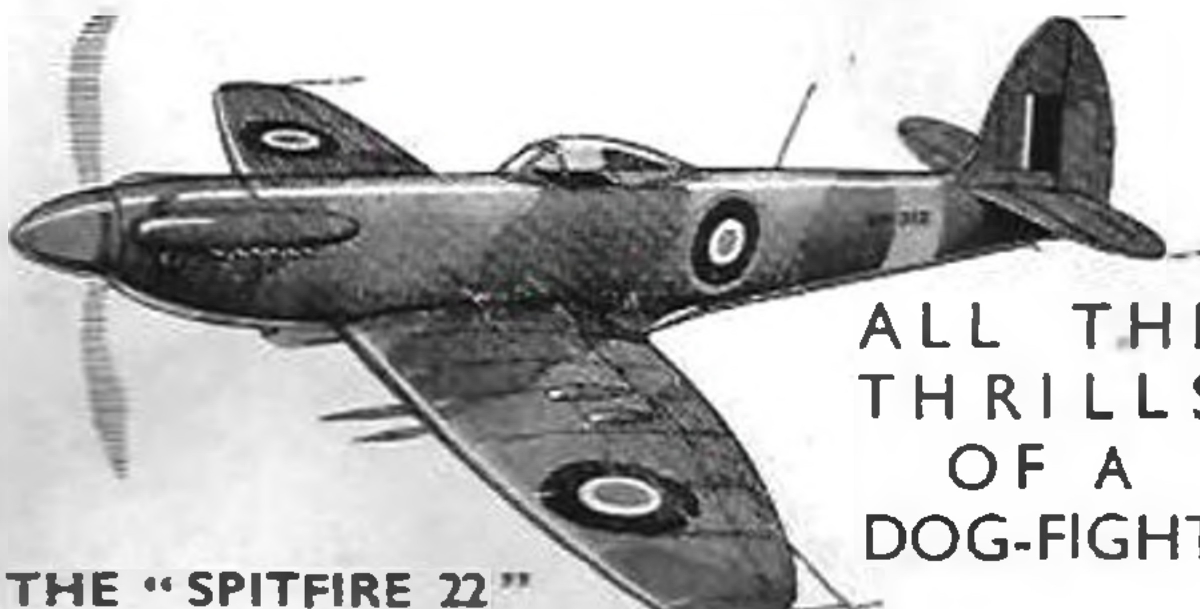

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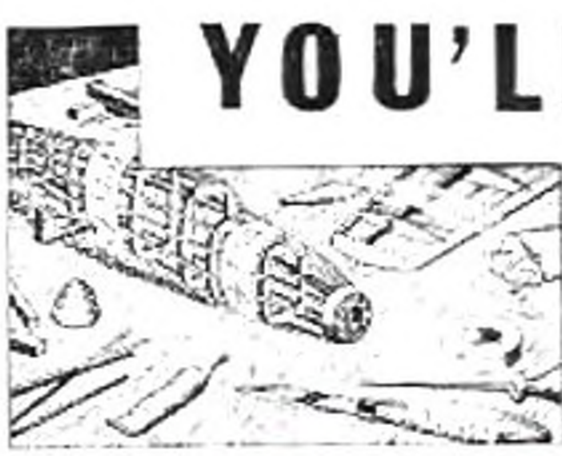

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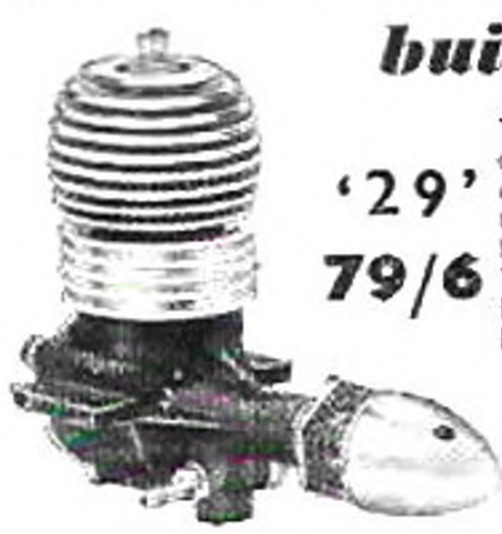

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