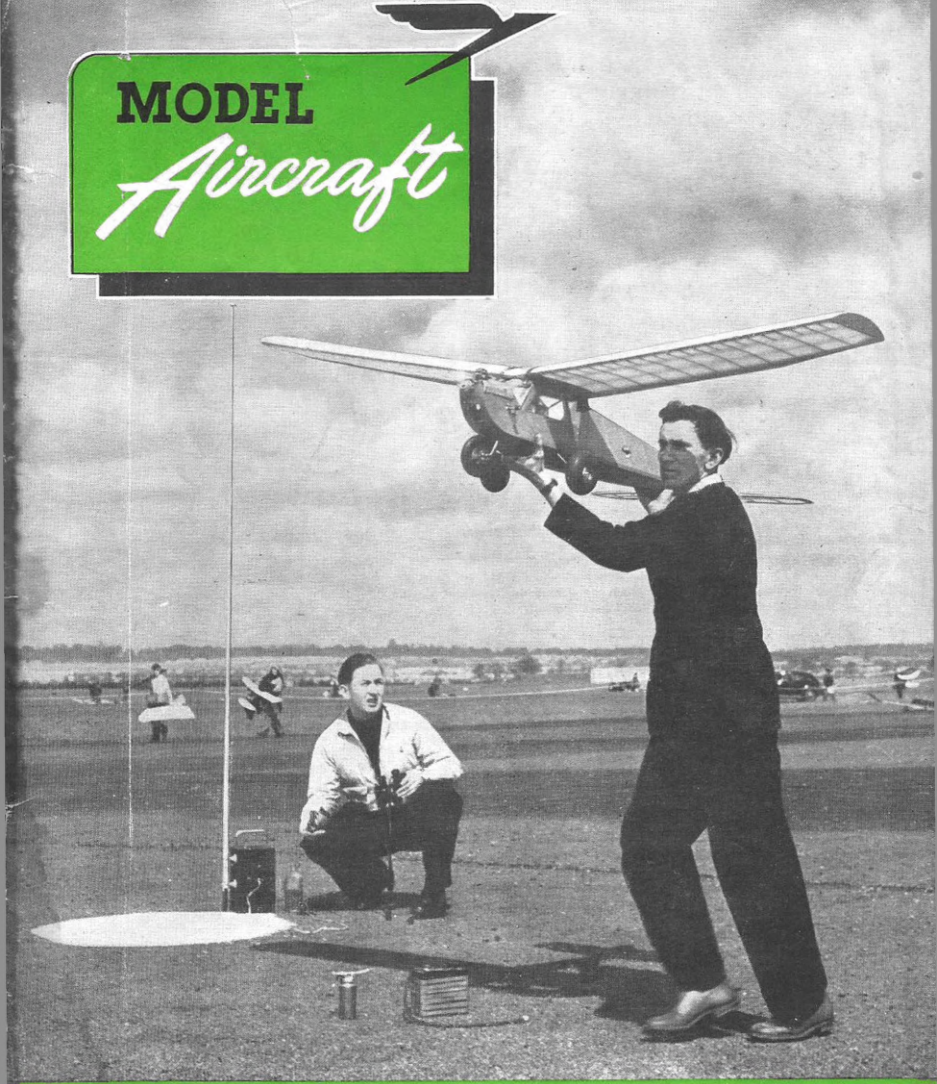
MODEL Aircraft



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JULY 1950

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THE JOURNAL OF THE SOCIETY OF MODEL AERONAUTICAL ENGINEERS

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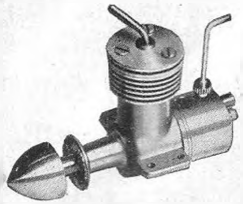

E.D. 1 c.c. Mark I (BEE)

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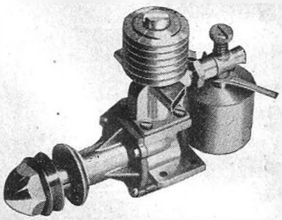
PRICE £2· 5· 0



E.D. 2 c.c. Mark II

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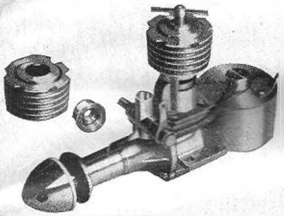

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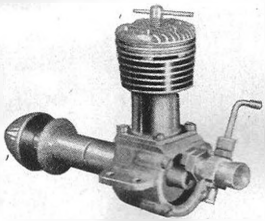

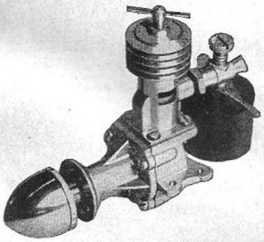

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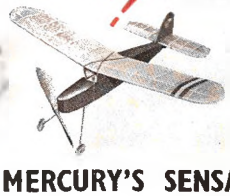

This 32 in. span semi-scale model is a true beginner's kit specially designed by Ron Young of Mercury Models, and is a direct follow-on from the Magpie. The Maybug is a smart-looking cabin job of robust design and one that builds very easily. Kit includes all necessary Solarbo Balsa and tissue, with photo-view plan and helpful building instructions.

Your Mercury Dealer will tell you the price.

MAGPIE

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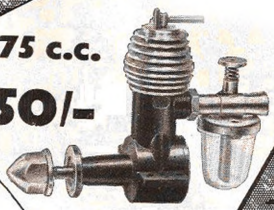

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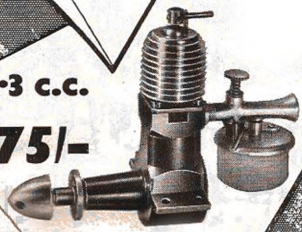

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MODEL Aircraft

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Editor: E. F. H. COSH

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Advertisement Manager: J. V. FORBES-BUCKINGHAM

JULY 1950 VOL. 9 No. 6

Contents

EDITORIAL

SUFFICIENT time has now elapsed since this journal appeared in its new enlarged form for us to assess the general reaction to the changes made. Opinion seems to be unanimous that the increased size and more varied contents are a great improvement. This is confirmed by the big increase in circulation which has taken place in recent months.

This naturally gives us considerable gratification, and we thank those readers, including many members of the model aircraft trade, who have been kind enough to write to us and express their appreciation of our efforts. We are, however, by no means complacent and are well aware that there is still room for improvement in MODEL AIRCRAFT. That is where you come in. We want to know your likes and dislikes. We want to know, for instance, which of our regular features appeals to you most—or least!

One of our readers recently suggested that we should reduce the margin around the type area and crowd more type matter on to the page. By the same post we received a letter from another reader who said that one of the most attractive features of MODEL AIRCRAFT to him was its present layout. Which one do you agree with? It is on points like these that we would welcome your views—why not go through this copy carefully and write to us about it?

We should also like to apologise to those readers who were unable to obtain copies of the last two issues. The demand for these exceeded even our optimistic expectations, and as a result they were sold out within a few days of publication. We shall continue to print more copies each month, but you can help us, and yourself, by placing a regular order for MODEL AIRCRAFT with your local newsagent or model shop.

Cover Story

This month's striking cover picture was taken by our photographer at Fairlop Aerodrome during the London Area S.M.A.E. Ripmax Trophy radio control event. The flier about to launch his "Rudderbug" is C. Hawkes, of the Battersea & District M.A.C.

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HERE AND THERE

The Editor Comments on Current Topics

DANISH SUMMER CAMP

For those who wish to combine a continental holiday with model flying at a low cost an excellent opportunity is presented by the annual camp organised by the Danish Royal Aerochil model section (previously known as "the Dansk Modelflyver Union.")

This is purely a friendly affair, although contests for all types of models form part of the programme, and it is run strictly on camp lines without any frills. A cordial invitation has been extended to any British model flyers who desire to attend. An essential item of equipment for those attending is a sleeping bag. If you want a cheap continental holiday, here is your opportunity if you don't mind roughing it.

The camp will, this year, take place at Novdel Aerodrome, near Vejle, during the week from July 10th to the 15th and the cost will be 43 Danish Kroner per head (£2 2s. 6d.), plus your fares each way.

Those who desire to attend should send in their applications to the S.M.A.E. immediately as the closing date for the receipt of applications is June 30th.

PROPAGANDA

Our correspondent Mr. D. Finch, whose provocative letter appeared in the May issue under the heading "Aeromodelling in the Doldrums?" certainly hit many nails on their heads, and we were particularly interested in his suggestion that efforts should be made to encourage more youngsters to take up aeromodelling as a hobby.

The Federation of Model Aeronautical Manufacturers and Wholesalers are fully alive to the present need for propaganda on these lines and some three months ago they decided to go ahead with a scheme suggested by Mr. J. V. Paterson of the Plantation Wood Co., briefly, the main features are: (*a*) Circularisation of all of the Educational authorities in the country, drawing attention to the advantages of aeromodelling; (*b*) Preparation of a brochure giving an introduction to every phase of the hobby; (*c*) Production of a film for showing schools, dealing with the growth and logging of balsa wood; manufacture of kits, engines, and accessories; contests; club activities, etc.

The first part of the scheme has already been put into effect, and it is hoped to complete it by the end of this year.

RADIO CONTROL CONTESTS

The S.M.A.E. Radio Control sub-committee when framing the rules for this year's Ripmax Trophy event made a commendable effort to arrange a more satisfactory type of R/C event than those held in 1949. Their two main objects were (*a*) To obviate the awarding of points on the personal opinions of the judges; (*b*) To break away from the apparent tendency to organise R/C events on C/L stunt schedule lines.

When the rules were announced many people expressed the opinion that the contest would be far too difficult. The "Doubting Thomas" were certain that none of the competing models would be able to complete the triangular course. How wrong they proved to be. In the London Area Contest at Fairlop, admittedly run in calm weather conditions, many of the twenty entries, did, in fact, complete the course, and two of them tied for first place. Surprisingly enough the spot landing test appeared to cause more trouble than the course flying—but more on this point anon.

All of the I.A. Ripmax entrants agreed that the new rules provided a much more interesting contest than the 1949 event, both from the flyers and the spectators point of view.

Now these new rules are by no means perfect—it was not expected that they would be, as it is only under contest conditions that the snags become apparent. These snags must be eliminated before next year's rules are decided upon, and it has been suggested that the competitors in this year's Ripmax and Taplin Trophy contests should be invited to send in the suggestions *now* for next year's rules.

The S.M.A.E. R/C Sub-committee want to arrange contests which will appeal to all R/C fans and the views and experiences of these contest flyers would be of great assistance.

ON THE SPOT

As I have said, spot landings seem to give R/C contestants a great deal of trouble and this was particularly noticeable in the Ripmax event at Fairlop. Time after time contestants made very poor landing approaches after the engines had cut when their models were in excellent spot landing positions. Lack of judgment of the amount of height lost by the model in a turn resulted almost invariably in the plane undershooting the landing area by a considerable margin.

As any pilot of full-sized aircraft knows, if when flying a light plane the engine fails, unless you immediately set about making a forced landing in the selected field *in a methodical manner*, in R.A.F. language you have probably " had it."

Why not adopt the full-size procedure for this spot landing business? The main points to remember are : When the motor cuts, fly the plane to the downwind side of the landing area by the shortest route. On reaching the downwind side turn the aircraft across wind. Lose height by gliding across wind, edging towards or away from the area as necessary. Do not make the cross-wind legs too long, so that by turning back across wind you can avoid the model getting out of range of the area. When turning back across wind always turn *towards* the landing area and *never, repeat never*, away from it. When the aircraft is judged to be at the right altitude make the final turn into wind for the landing. I know that when flying an R/C model it is not as easy as all that, but this method of approach does, at any rate, give the flyer a far better chance of landing the plane on the spot than the hapazard type of approach to which I have referred.

A NORTHERN " MOVING FINGER "

Do you remember the " Moving Finger? " Way back in 1938 when I was Editor of the *Model Aeroplane Constructor*, one of the most popular features of this publication was the pertinent (very much so!) paragraphs of this contributor. The elusive Scarlet Pimpernel of aeromodelling ; he seemed to get here, there, and everywhere, and there was not much that escaped his notice. Many were the guesses that were made as to his identity, and although a few people got pretty near to the mark he managed to preserve his anonimity.

The " M.F." is still very much alive and kicking, and it has often been suggested that he should take up his pen again—maybe he will—we shall see. I wonder, however, whether his sharply pointed barbs would be taken by the lads of to-day in the good humoured spirit of the pre-war modellers—I doubt it.

I was reminded of the " Moving Finger " by reading the first instalment of Northern Notes which appeared in our last issue, the writer of which has a style very reminiscent of the " M.F." I wonder whether he will succeed in concealing his identity as successfully?

Incidentally, we want to find an apt non-de-plume for our Northern correspondent. Any suggestions? The sender of the most suitable one will receive a free year's subscription to MODEL AIRCRAFT.

" M.E." EXHIBITION

A feature of this year's " M.E." Exhibition, which is being held at the Royal Horticultural Hall, London, S.W.1., from the 9th-19th August, will be a large section in which will be shown models of all types in the course of construction. Amongst the many thousands who attend the Exhibition each year there must be many who admire the completed models in the competition section and on the trade stands but who have little knowledge of the methods of construction employed. This demonstration area will, without doubt, be a great attraction and it is hoped that many of the trade exhibitors will also be showing on their stands some of their products in the course of manufacture.

THE FLYING GROUND QUESTION

The situation concerning flying grounds is becoming decidedly difficult in many districts and there have been one or two cases recently, where local authorities have taken much stronger action than they are entitled to under the terms of the recent directive issued by the Home Office.

In their directive, the Home Office make it quite clear that the object of the powers given to local authorities concerning the establishment of bylaws regulating the flying of model aircraft on public open spaces is not to *prevent* model flying, but to ensure *safe* flying.

Quite a number of local council members and officials appear to ignore this aspect altogether and completely ban the flying of models on the public open spaces under their control on the slightest pretext and without adequate reason.

It is extraordinary how a perfectly plain and straightforward document can be misread or ignored altogether by persons holding responsible positions and one is often led to wonder how much is wilfully misread or overlooked.

Any club which has suffered in this direction should immediately inform the S.M.A.E. so that suitable representations can be made in the right quarters.

BIGGER AND BETTER

This tailpiece story comes from Ron Warring. Zombies club member, Duncan Geddie was testing his 12 ft. plus span glider at Blackheath, with another 11 ft. span job for company. The inevitable crowd gathered, but one fellow in particular seemed most interested, asked all sorts of questions, and studied the jobs from all angles. After a while, and in all seriousness, he delivered himself of this masterpiece. " Tell me," he said. " Has anyone ever built a really *big* model of about twenty ft. span or so? "

MODEL REPORT

Helicopters

By Ron Warring

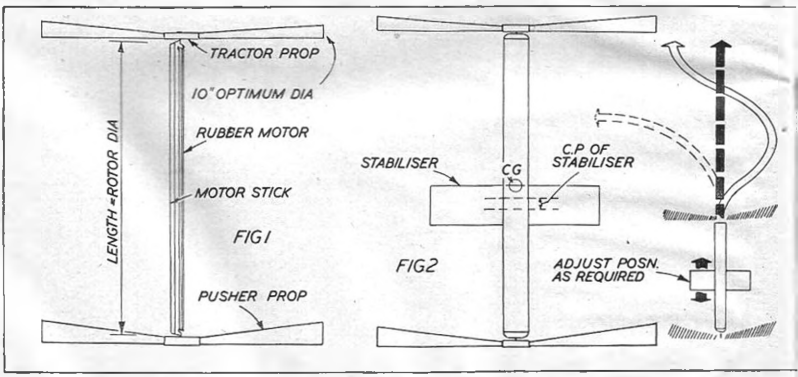
BY and large, modellers generally ignore helicopters—except for the one annual competition for the type at the Northern Heights Gala. Probably the usual models of this type are just a little *too* functional for the average enthusiast, consisting of just a fuselage and a couple of propellers, but they can be quite good fun. In fact, the general rule seems to be that the simpler you make a helicopter, the better it is likely to fly.

Quite seriously, Don Brockman, the writer, and a few others considered the possibilities of a simple helicopter for *rough weather* duration contest work some years ago. The model, being pointed upwards for launching, and having vertical ascent anyway, should have no take-off difficulties. A motor run of 90 sec., using enough power to give a rapid initial rate of climb and thus get clear of ground disturbances, was originally aimed at, with a two minute motor run a distinct possibility.

Flight path for rough weather conditions would be nearly ideal. A rapid initial, and vertical climb, gaining, or at least maintaining height for the rest of the power run, and then a positive descent to earth with very little chance of losing the model. Estimated flight time was 2 min. with a 90 sec. power run. Actual distance covered from the launching point would be less than that of a conventional model under the same conditions—and a 6 min. aggregate for three flights would earn a place in most competitions held under conditions like this year's Gamage Cup event.

That, at least, was our original object. It never worked out that way, but thinking back over those early experiments it still seems that it might be a feasible proposition. Those early models at least taught us a lot about helicopters, although much of the knowledge we gained was of the "negative" type. That, is, we mostly found out what *not* to do, rather than the basic rules for stable and efficient helicopter flight.

The simplest type of helicopter comprises just a motor stick with a bearing at each end, and two elementary fine-pitch propellers or rotors, Fig. 1. The rubber motor is connected directly between the two propeller shafts, driving the motors with equal torque, in opposite directions. Both rotors are arranged to develop upwards thrust, i.e. one rotor



(usually the top one) is normal handed and the other rotor of opposite pitch, and the motor wound accordingly.

In very small sizes—rotor diameter about 8 in. to 10 in., these little jobs perform extremely well in still air. They are generally quite stable with no dihedral on either rotor, the only likely fault being that if the bottom rotor is lifting too strongly, it may cause the bottom of the model to rotate about the centre of the top rotor. This is overcome by making sure that the lower rotor cannot develop more lift than the top one—giving it greater pitch, for example, so that it rotates more slowly.

The design can be cleaned up by using an enclosed fuselage to accommodate the motor, again with propellers or rotors on each end, but this puts up the total weight and demands a large model before the same efficiency can be achieved. Unfortunately, once the model size increases, so also do the stability problems. In fact, a larger model of this layout is not usually successful unless fitted with stabilising fins.

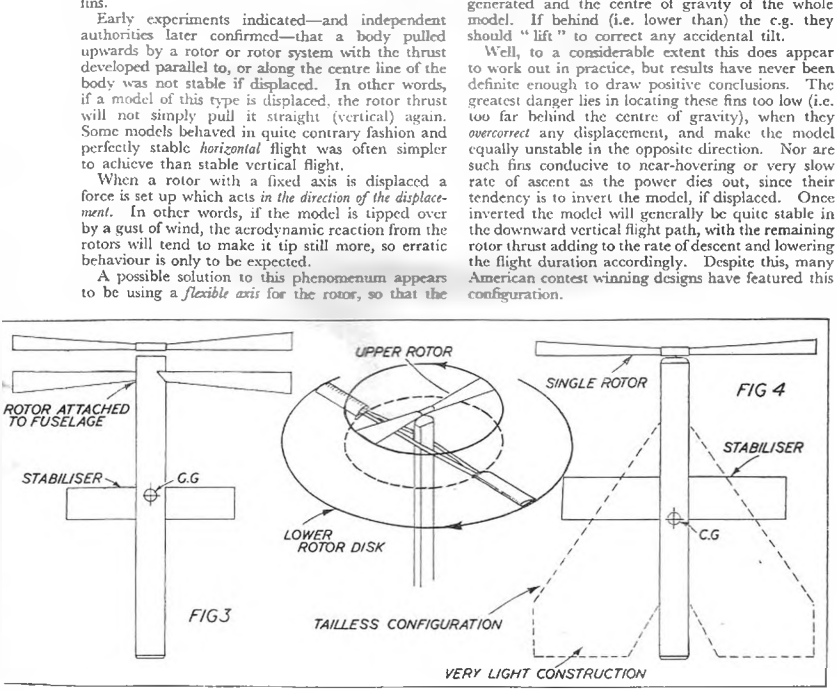
Early experiments indicated—and independent authorities later confirmed—that a body pulled upwards by a rotor or rotor system with the thrust developed parallel to, or along the centre line of the body was not stable if displaced. In other words, if a model of this type is displaced, the rotor thrust will not simply pull it straight (vertical) again. Some models behaved in quite contrary fashion and perfectly stable *horizontal* flight was often simpler to achieve than stable vertical flight.

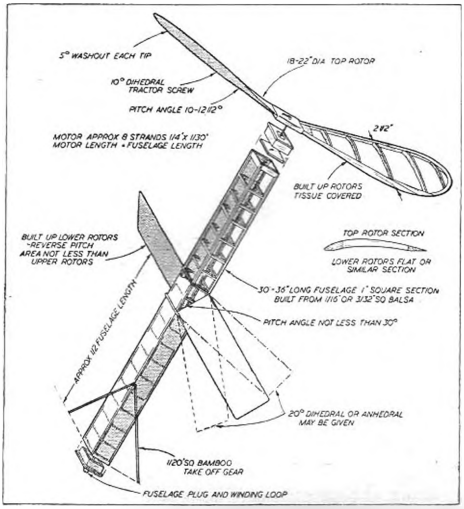
When a rotor with a fixed axis is displaced a force is set up which acts *in the direction of the displacement*. In other words, if the model is tipped over by a gust of wind, the aerodynamic reaction from the rotors will tend to make it tip still more, so erratic behaviour is only to be expected.

A possible solution to this phenomenum appears to be using a *flexible axis* for the rotor, so that the rotor disc can tilt independent of the fuselage, when a fair measure of automatic correction should be present. To the best of our knowledge this has not yet been tried on a model of this type, but seems a worthy subject for experiment.

But, before the above fundamental failing of the simple helicopter layout has been fully appreciated, a number of experiments were also made with different rotor systems, several of which have given very promising results. First attempts used a fixed fin on the fuselage, which could be adjusted for position. Main object of such stabilising fins is that in normal vertical flight they have zero angle of attack, and therefore no effect on performance (other than decreased rate of climb due to their weight and drag). If, however, the axis of the model is displaced from the vertical, these fins assume a positive angle of attack and therefore generate a side force (like wings). This side force will aggrevate, or damp out, the original displacement, depending upon the relative positions of the centre of pressure of the side force generated and the centre of gravity of the whole model. If behind (i.e. lower than) the c.g. they should "lift" to correct any accidental tilt.

Well, to a considerable extent this does appear to work out in practice, but results have never been definite enough to draw positive conclusions. The greatest danger lies in locating these fins too low (i.e. too far behind the centre of gravity), when they *overcorrect* any displacement, and make the model equally unstable in the opposite direction. Nor are such fins conducive to near-hovering or very slow rate of ascent as the power dies out, since their tendency is to invert the model, if displaced. Once inverted the model will generally be quite stable in the downward vertical flight path, with the remaining rotor thrust adding to the rate of descent and lowering the flight duration accordingly. Despite this, many American contest winning designs have featured this configuration.





The same applies whether the rotors are located at each end of the motor tube or fuselage, or the bottom rotor raised to near the top of the fuselage and fixed to it as in Fig. 3. The fuselage—and lower rotor—then rotates as one unit, part of the advantage claimed being that this automatically slows the rate of rotation of the lower rotor and thus renders it less liable to upset the arrangement. This type, too, has given good results, but is far from being consistent enough to provide the pattern for a practical duration helicopter. One feature of such a design which has been criticised is that the two rotors will interfere with one another which can, of course, be overcome by arranging the lower rotors on outriggers clear of the upper rotor disc, whence they are operating in undisturbed air. Again this has given good results as an efficient *lifting* rotor system, but stability problems still remain.

Suspecting that the lift of the lower rotor has been the cause of much instability generating too much lift and "pushing" against the top rotor), single rotor layouts have been tried, with a large stabilising fin on the fuselage. This fin has two main purposes. It must now act as an airbrake to prevent the fuselage revolving quickly and thus starve the rotor of power, and automatically correct any upset. The former it can do fairly readily, provided it has sufficient area, but its use as a stabiliser still remains very tricky. It will now tend to have an exaggerated effect when displaced, due to its relatively large area, giving a strong reaction in one direction (recovery) or another (upsetting). Its own centre of pressure will vary according to the amount of tilt, i.e. the angle of attack induced, and the usual thing that happens is that it either turns the model right over on to its back, or makes it swing violently from side to side. It would appear that the only real solution would be to make these stabilising fins as a completely stable aerofoil themselves, when the helicopter becomes virtually a powered tailless model designed to climb vertically with a very large propeller, Fig. 4. This, indeed, may be quite a good approach to the problem, the rotor blades being folded back at the end of the power run to turn the model into a tailless glider for the descent. Just how such a machine would fit in with the definition of a model helicopter is a matter of some argument.

The single rotor system, as such, is not all that attractive on account of the waste of power involved. Only a proportion of the rubber power is used in driving the rotor, the rest being wasted in rotating the fuselage unit. Power reserve is critical, for the helicopter as a vertical climbing machine is a very inefficient aeroplane at the best of times. The sole support or lift is derived from the thrust of the rotors. To maintain level (hovering) flight, therefore, thrust must equal weight. Excess thrust means climb. With a conventional model, on the other hand, in level flight "thrust" equals "drag," and "lift," generated by the wings due to their forward speed, equals "weight." The ratio of "lift" to "drag" —and therefore "weight" to "thrust"—may be 8 : 1, or even higher, on a good model. In other words, only one-eighth of the thrust (power) would be required to fly a normal model as compared with a helicopter of the same weight.

This does not hold true all the time, but only in vertical helicopter ascent. Given a sideways motion as well, a helicopter rotor immediately becomes more efficient as a generator of lift, which is why full size helicopters can achieve a reasonable figure of efficiency. But in designing a simple model, at least, vertical climb must be the main consideration. If we can stabilise the model under such conditions we can improve its efficiency by trimming it so that it will climb at a certain angle from the true vertical into wind, i.e. actually forwards and upwards.

But it is pretty obvious, that, with such a low efficiency, weight is a very serious problem. To get the best performance, therefore, the lightest possible structure must be used. This will permit of a smaller cross section rubber motor, and therefore more turns and greater duration of power run. Duration of flight will be largely a matter of length of power run, and, in fact, experience has shown that the highest flight times are generally recorded when the motor is so arranged that power run duration accounts for almost the whole of the flight time. A shorter

power run may give much greater height, but usually a lower overall duration. The main objection in using lower power and thus a longer motor run, is that there is little reserve of power to combat poor conditions, and if the model flies off into a down-draught it may record a very poor flight time.

The other way to get a longer power run, which is mainly a matter of getting more turns on to the motor, is to use a longer motor. But, here again there is a limit. Motor weight should account for at least 50 per cent. of the total weight of the model, but exceeding this figure by any condiserable amount generally results in a motor length which is difficult to handle, a very weak model, or both.

Using a long motor in a short fuselage (to save structure weight) does not appear to work out in practice. It has been found necessary to use a fuselage roughly as long as the motor, so that there is little or no slack between hooks when unwound. Cross section of the fuselage can then be considerably reduced as there is less danger of the rubber bunching.

To reduce the weight of the model as far as possible, lightweight construction and the minimum of components is then required. Thus the most successful models of this type have generally employed just the fuselage, top rotor, and a second fuselage rotor which doubles the part of rotor and stabiliser. Preferably the latter should be adjustable for position.

Proportions of such a model are shown in Fig. 5, which represents about the most useful size for duration work, although the same proportions should hold true, scaled up or down.

The angle and the attitude (pitch angle) of the bottom rotor are critical, and the best position can only be found by flight testing. It is also debatable whether or not to give the lower rotors an upward or downward dihedral angle. The former should be more stable under climbing conditions.

Most models of this type are reasonably stable as long as they are climbing upwards at a reasonable rate, or at least can be stabilised in this attitude by optimum lower rotor position. But when the rate of climb is low, and during the initial acceleration from take off, they have a definite tendency to become unstable. The model may tilt immediately on take-off and swoop round in a series of circles before stabilising itself, or starts the same procedure towards the end of the power run. Take-off troubles can be reduced by letting the upper rotor rotate for a second or so to pick up speed before releasing the model, although the reaction from the lower rotor once it starts rotating will then induce a momentary upsetting force. But despite its limitations, this particular layout still appears to be the best for normal duration-type flying.

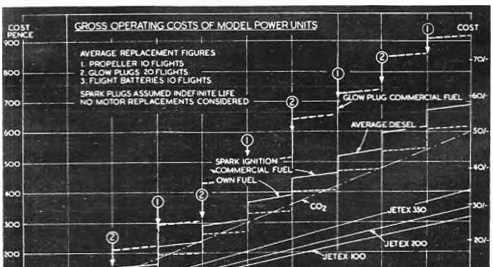
Gross Flying Costs

THE gross or total operating costs of power models is frighteningly high, particularly if all the necessary repairs to the motor are taken into account. A hundred flights with a glow-plug motor, for example can cost £4—or very nearly 10d. per flight!

For the purpose of drawing up a comparative chart, the only replacements taken into account are propellers and glow-plugs. A propeller replacement every ten flights is a very fair average figure; also a glow-plug replacement every 20 flights. Broken crankshafts or otherwise damaged motors are not accounted for.

The surprising thing is that Jetex power is the cheapest, and CO_2 power at 6d. a time is quite comparable with average figures for diesel and spark-ignition motors. In the case of the CO_2 motor, propeller replacements have been ignored and the real figure is probably somewhat higher than that shown on the graph. With luck, a CO_2 model will give 100 flights with one propeller, or repairs to a broken propeller are usually quite satisfactory.

In the case of spark-ignition motors, the greatest cost arises from flight battery and propeller replacements. The logical way to cut down all flight costs with power models is, of course, to cut down replacements. The use of a good coil will prolong the life of flight batteries. Correct and careful trimming will help give propellers a longer time between breakages. Folding propellers would seem very advisable on the smaller models. But whichever way you look at it, operating power models is certainly a costly business!



THE BRITISH NATIONALS AT YORK

Once again the British Nationals have been marred by high winds, the weather at this year's meeting at York being the worst so far encountered. The wind blew at gale strength for most of the three days and many of the contestants very wisely decided not to risk wrecking their models. Of the total entry of 694 no less than 249 scratched from the contests. The R/C event was perhaps the hardest hit—only nine of the 49 entrants made flight attempts—and the contest was reduced to a farce. It does seem from past experience that this important event in the aeromodelling calendar should be held later in the year in future.

FULL REPORT AND FURTHER PHOTOGRAPHS WILL BE FEATURED IN NEXT MONTH'S ISSUE.

COMPETITION RESULTS

"MODEL AIRCRAFT" TROPHY

1.	R. Copland	Northern Heights	378
2.	R. Hartley	Seaham	352.9
3.	D. H. Rumley	Kentish Nomads	339.6
4.	P. C. Lindsay	Wolves	336.3
5.	C. P. Miller	Bradford	307.3
6.	E. C. Muddow	Sheffield	281.4
7.	R. C. Meeks	Birmingham	273.5
8.	R. Kendall	Thames Valley	229.6
9.	R. H. Warring	Zombies	225.5
10.	N. G. Marcus	Croydon	223.1
11.	W. Dallaway	Birmingham	212.9
12.	V. Dubery	Leeds	210.2

118 Entries—39 scratched

THURSTON CUP

1.	K. Nicoll	Blackpool	407.3
2.	F. E. Hawkins	Birmingham	394.9
3.	R. J. North	Croydon	375
4.	L. Barr	Pharos	349.8
5.	R. N. Yeabsley	Croydon	335.9
6.	T. A. Geesing	"	333.7
7.	R. Firth	York	309.7
8.	A. Wrigley	Bury	300
9.	P. Scringer	Huddersfield	273.7
10.	P. Read	S. Birmingham	272
11.	D. A. Lawrence	Waylarers	269
12.	D. Rumfite	Leeds	263.9

203 Entries—51 scratched

SIR JOHN SHELLEY CUP

1.	J. A. Gorham	Ipswich	356.9
2.	B. Fairey	Knowle	336.5
3.	C. J. Davey	Blackpool	244.5
4.	R. Goodman	Unattached	241.2
5.	A. E. Reynolds	Flying Saddlers	210.4
6.	E. Lord	Accrington	201.3
7.	N. A. Clark	Bishop Auckland	197.4
8.	M. H. Green	Men of Kent	192
9.	R. Meanwell	Northampton	187.8
10.	J. G. Eiffaender	Macclesfield	186.8
11.	D. Bennett	Prestwich	185.8
12.	R. A Palmer	Ipswich	185

269 Entries—101 scratched

S.M.A.E. RADIO CONTROL TROPHY

1.	C. Doughty	Birmingham	60
2.	S. J. Sutherland	West Essex	40
	J. Gorham	Ipswich	
3.	G. Honnest-Redlich	Bushy Park	25
4.	A. Coates	Huddersfield	10
	D. J. Allen	West Essex	
	A. J. Ingham	Blackburn	
5.	W. Williams	Seaham	5

49 Entries—41 scratched

"GOLD" TROPHY

1.	B. G. Hewitt	S. Birmingham	332.7
2.	J. G. Eiffaender	Macclesfield	281
3.	W. H. C. Taylor	West Essex	273.7
4.	R. Cook	Rotherham	252.3
5.	A. R. Buck	Five Towns	261.3
6.	P. G. Russell	Worksop	259
7.	L. Steward	West Essex	254
8.	N. J. Butcher	Croydon	219.7
9.	J. Swift	Sheffield	140.7

49 Entries—16 scratched

WOMEN'S CUP

1.	Miss D. J. Knight	Kentish Nomads	167.2
2.	,, B. Joyce	Leeds	126
3.	,, M. Stevens	N. Shields	100
4.	,, S. Bell	Huddersfield	90
5.	,, P. Grimes	Barnsley	60
6.	Mrs. D. P. Gunter	Bushy Park	26

7 Entries—1 scratched

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1. A fellow Manchester club member indicates the wind direction to J. Butt as he gets his model away in the "Model Aircraft" Trophy Contest

2. R. F. L. Gosling and Bill Ford hard at work acting as recorders in the Thurston Cup event.

3. Sam Messom is assisted in drawing the winning ticket in one of his "fiddles" by a young lady visitor.

4. One of the Southern competitors, R. Lee, of Barking, Essex, launching his model in the "M.A." Trophy Contest.

5. Paul Banks, of Rotherham, displays a neat line in decorations on his Thurston Cup entry.

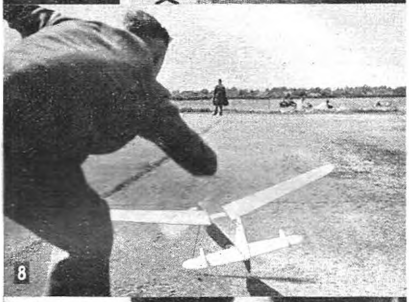
6. Eric Clutton, of the Five Towns Club, with Peter Scrimgeour and Sylvia Bell, of Huddersfield.

7. Brian Hewitt, of S. Birmingham, who won the "Gold" Trophy for the second year in succession with his Yulon 29 powered model.

8. Despite the strong wind, T. Reed, of Wigan, was able to launch his model cleanly in the "Model Aircraft" Event.

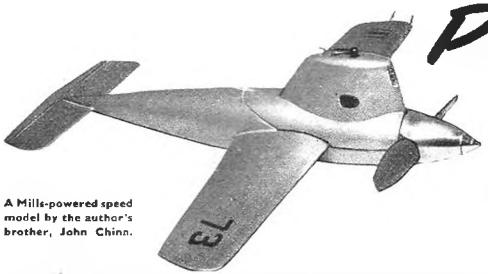
9. Second place winner in the "Gold" Trophy Contest, J. G. Eiffaender, of Macclesfield. Both model and diesel engine were of his own design.

10. Some of the Southern "Gold" Trophy entrants. Left to right: Norman Butcher (Croydon), J. S. Grover, D. I. Bowles (Hastings), Pete Westbrook (Zombies).



Accent on Power

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



A Mills-powered speed model by the author's brother, John Chinn.

Flexible Propellers

COMMENTING on the results published in the writer's article : " Propellers and Power," in the December issue of MODEL AIRCRAFT, Fred Borders, designer of the " Tru-flex " series of airscrews, makes some interesting disclosures in the course of recent correspondence.

Readers will recall that power-absorption tests and actual flight tests, had indicated that the 11 × 5½ Tru-flex flexible plastic propeller showed a marked increase in pitch as revolutions were increased. Far from this being a " by-product " of the design, as might be supposed, the Tru-flex was, Borders explains, designed to give this slight variable-pitch effect. Resulting from many years' research on model propellers, the original Tru-flex were intended only for free-flight, and comparatively low-speed operation, and it was found that washing-out of the blades could be corrected by utilising the centrifugal force exerted between certain speeds. Increased correction and increased speed would then cause washing-in, i.e. an increase in pitch, and a slight over-correction was actually introduced in the final design.

This would, of course, explain the considerable increase in pitch experienced with the free-flight type 11 × 5½ Tru-flex when running at fairly high speeds. Commenting on the cropping of the blades to 10 in. for flight tests, the designer points out that this would reduce the efficiency of the washed-out tip of the Tru-flex blade and mentions that pressure tests, using a pitot and U-tube have indicated a 25 per cent. improvement for the Tru-flex over conventional propellers, in this respect.

The new 1.49 c.c. Allbon Javelin.

Regarding the throwing of blades, Borders gives the following reasons for this being experienced in some quarters :—

(1) Cutting away the boss of the airscrew to make it fit a short shaft instead of using a sleeve nut.

(2) Drilling out the shaft-hole off centre.

(3) The use of small diameter driving discs, such as are to be found on certain lightweight diesels, causing distortion of the boss when tightening up.

(4) Use of driving-discs without serrations, necessitating over-tightening to obtain adequate grip, again causing distortion or cracking the propeller boss.

(5) Allowing a diesel to run unevenly at high speed, this fault often being unnoticed because the propeller absorbs most of the resultant vibration into the root of the blades. This vibration being converted into heat, results in a softening of the blade root, whereupon the centrifugal force elongates the heated material and a throw results.

Having run Tru-flex propellers up to speeds as high as 14,000 r.p.m., the writer is inclined to agree that high revolutions are not necessarily the cause of blade throwing with flexible propellers. On the other hand, some high-speed diesels are notorious " vibrators " and most instances of blade throwing do seem to have been with these types.

For free-flight and stunt work, the actual performance of a suitable flexible propeller, as compared with an equivalent wooden type, does not seem to differ to any very great extent, and, particularly for stunt work, the only justification for using a " hard " propeller for general use seems to be the " prestige " given to the intrepid flyer who thus does not identify himself with the beginners' brigade—until he prangs mightily, that is. Tests carried out by the writer's brother flying Yulon and Frog 500 powered stunt models using 9 × 8, 10 × 8 and cropped 11 × 5½ propellers have all demonstrated perfectly satisfactory stunt performance with level flight speeds not more than 5 per cent. below those obtained with the best wooden propellers. With the present tendency towards using more powerful engines in lighter stunt

models, slight losses in speed can well be tolerated.

Most readers will already have read, in the popular dailies, some garbled reports which accompanied photographs of Fred. Borders' latest R/C model, illustrated here, and of which some details were given in the March/April issue of MODEL AIRCRAFT.

The model, which is 1/9th scale, was actually designed and built from a 1 72nd solid plan of the Dakota I. (Hypercritical scale addicts detecting any deviation from the prototype are therefore recommended to switch their attention to the model car racing world.) Fuselage construction features the use of a rectangular basic frame of $\frac{3}{8}$ in. sq., with formers added and 28 stringers of $\frac{3}{8}$ in. × $\frac{1}{4}$ in. running from nose to tail, 3/32 in. sheet then being laid over these and the whole silk covered.

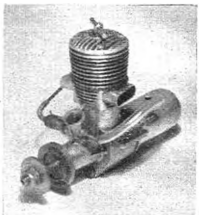
Tail and fin areas are to scale and only the outer 4-ft. panels of the 11 ft. span wing are detachable. The engines are 16 c.c. Forster 99's, with two-speed contact-breakers, and these provide the means of controlling the model by radio. Two radio receivers are carried, each of which can switch one engine over from the low-speed (retarded) ignition circuit to the high-speed (advanced) circuit. Respective speeds, on the two circuits, using 14 × 6 3-blade Tru-flex airscrews, are about 2,500 r.p.m. and 9,000 r.p.m.

This control system was chosen in order to get away from the troubles which arise in normal control-surface actuator mechanisms. Directional and longitudinal control is hoped for by variation in the speed of either or both engines, combined with a specially designed variable-pitch hub which will automatically reduce the pitch to zero at the lower speed to enable height to be lost, or a landing approach to be made with the engines still running. Three-point landings should then be possible by giving a final burst to both engines just before the touch-down. Nice work.

New Engines

Only when we look back to the engines produced during the first two years after the war and remember that, prior to the 1949 season, few of the experts were using anything except American makes, do we realise the tremendous strides made recently in British model i.c. engines. Now we have, in every category, with the possible exception of the 10 c.c. class, engines equal, or even, in some cases, superior, to the best American products.

For 1950, new and improved models will, by the time this appears in print, be available from many leading British model engine manufacturers.



The new Frog " 250 " diesel.

The Allbon Javelin

Among the smaller classes, a good example of well-balanced design is found in the new Allbon Javelin. This little motor, with a power output, superior to anything hitherto available in Class I, should be ideal for speed work and for small power-duration models. Exceptionally compact for a motor of only 1.49 c.c., it will fit admirably into a small speed job and, weighing rather less than the average 1 c.c. engine, should give a real rocket climb to a well-trimmed power-duration model.

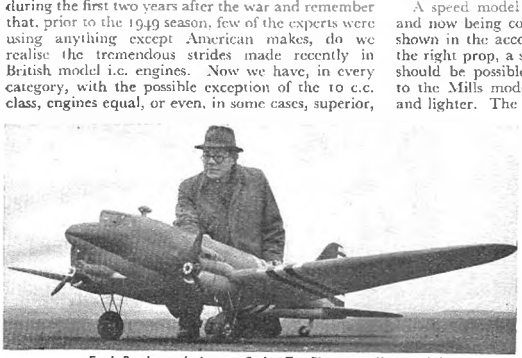
Despite its high performance (a production example tested by the writer gave over 0.1 b.h.p. at 10,000 r.p.m.) the Javelin surprises one with its easy starting qualities and is quite suitable for novices on this account. The Javelin does, in fact, succeed admirably in combining high power and high revolutions with easy handling, considerable flexibility, a compact layout and the very low weight of 2¼ oz.

Speeds possible with Class I models seem to have been somewhat exaggerated on occasions and the official British record at the time of writing is still only 51.7 m.p.h. Speeds obtainable with standard Class I engines previously available do not appear to be much above 60 m.p.h., but with the Javelin, in the right type of model, it should be possible to exceed this figure by 10-20 m.p.h.

A speed model specially designed for the Javelin and now being completed by the writer's brother is shown in the accompanying 3-view drawing. With the right prop, a speed of 70 m.p.h. with this model should be possible. In general layout it is similar to the Mills model illustrated but is much smaller and lighter. The fuselage is circular in section, with the engine cowled—although whether complete cowling is of any great help with small models seems to be a debatable point, in view of the high speeds achieved in some quarters with uncowled cylinders.

A drop-out Sadler pattern undercart, slightly modified to reduce the risk of jumping on take-off, is used in place of the more popular dolly, this type having been found to function quite satisfactorily with previous models.

The Allbon Engineering Company, makers of the Jave-



Fred Borders, designer of the Tru-Flex propeller, and his superb Dakota radio-controlled model.

lin, have, themselves been testing out the Javelin in a speed model and report having repeatedly achieved speeds in excess of 75 m.p.h.

The Elfin 1.49

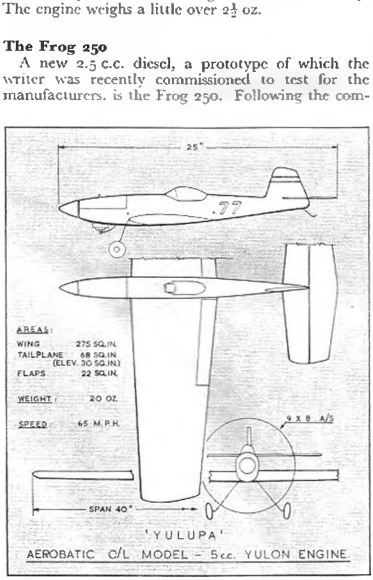
Another small diesel which should prove popular for Class I speed events is the new Elfin 1.49, one of the first production models of which has recently been received in order that a dynamometer test may be carried out for the makers. Very slightly heavier than the Javelin, the 1.49 also employs a shaft type rotary induction valve with the now familiar type circumferential porting. Unlike previous Elfin designs, the radial type mounting is replaced by lugs to permit the beam mount generally considered more satisfactory for C/L models.

Again, this is a very compact engine and preliminary tests have been indicative of a very useful output —as, of course, is to be expected of an Elfin design in view of the high performance displayed by the previous models, the 1.8 and 2.49.

The Elfin 1.49 has a bore of .503 in. and its stroke is .466 in. As with previous models a considerable degree of supplementary sub-piston air induction is used. The piston itself is of cast iron, the cylinder liner being of nickel-chrome steel, as is the crankshaft. A cast-iron main bearing is used and the crankcase is a pressure die-casting in aluminium alloy. The engine weighs a little over 2¾ oz.

The Frog 250

A new 2.5 c.c. diesel, a prototype of which the writer was recently commissioned to test for the manufacturers, is the Frog 250. Following the commendable policy of not advertising new products until stocks are ready for the model shops, Messrs. International Model Aircraft Ltd. have not announced the 250 up to the time of writing but production should be well advanced by the time these words appear.



The general appearance of the 250 prototype, as will be seen from the photograph of the model tested, is not unlike that of the Frog 500, I.M.A.'s high-performance 5 c.c. glow-plug engine which claimed so much attention on its introduction a few months ago. Its compact layout features the use of a shaft type rotary valve with intake above the main bearing and twin transfer and exhaust ports in conjunction with a flat-top piston.

Like the 500, the 250 has a cleanly die-cast one-piece crankcase and lower cylinder barrel, the die-cast head and well-machined cylinder with integral fins being attached to this with four long bolts. Like the 500, too, fuel is drawn from a rear-mounted tank and there is a long needle-valve extension, flexibly coupled, to keep ones fingers away from the prop. Bore and stroke of the engine are .580 in. and .575 in. respectively, and the checked weight of the prototype, including tank, was 5¾ oz.

The most noteworthy running characteristic of the 250, when under test, was the manner in which the engine held steady torque and r.p.m. readings for long periods. Unlike most diesels (and also some lapped piston spark and g.p. ignition engines) the 250 showed an almost negligible falling off in power with warming up.

The prototype engine tested has been fitted, by the I.M.A. Experimental Dept., into a standard "Centurion" cabin model carrying a 1 lb. payload to simulate R.C. equipment, bringing the total weight up to nearly 50 oz. and is reported to have given a very satisfactory performance.

The New Eta 29's

The most successful British racing engine so far produced has undoubtedly been the Eta 29, and, although speed C/L flying has not yet reached expected levels of popularity in Britain, the Series I Eta, during 1949, clearly demonstrated its ability to compete on equal terms with the best contemporary trans-Atlantic designs and it will no doubt be on the improved Series II and III model 29's that most British speed enthusiasts will depend, in the 5 c.c. class, for the 1950 season.

To date, three modified models have appeared since the original Eta 29 was introduced at the end of 1948. These follow a continual programme of development by Eta Instruments Ltd., and have, in the main, been in the form of single modifications, the precise effect of which have been carefully analysed and adopted only when found to be a step in the right direction.

The first modification to the original production 29 was confined to porting which raised the peak r.p.m. by nearly 1,000 r.p.m. to 14,000-14,500 r.p.m. and flattened the peak of the power curve considerably—an aid to higher potential aircraft speeds by reason of more efficient airscrews and the greater

acceleration obtainable from a more flat power curve.

In the Series II unit, introduced for 1950, output has been raised to give a b.h.p. of better than .6 at 15-16,000 r.p.m. Here again, port timing has been amended, compression-ratio has been reduced to 8.5 : 1 and carburettor throat area increased by 25 per cent. Another modification introduced on this model is the use of a one-piece rear crankcase-cover and venturi.

The Series III model lately announced has a similar performance to the Series II, the main differences being in the size of the exhaust tract, transfer passage and certain other internal details.

The Eta 15 and 19

Already announced is the new Class III Eta 19 and, due off the " secret list " by the time this article appears, will be Eta's latest addition to their racing engine range, the little " 15 " for Class II speed work.

The " 19," of 3.25 c.c. capacity should, of course, be the logical choice of speed enthusiasts for Class III flying since it is the only British racing engine built in this class. With an output quoted as .35 b.h.p. between 14,000 and 15,000 r.p.m., this engine should be more than a match for its American counterpart, the McCoy 19.

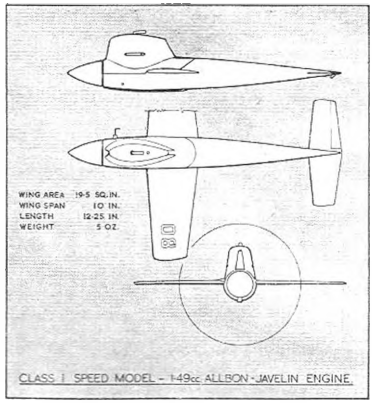
The Eta 19 follows the same general design as the 29 and features a disc rotary valve mounted in the rear of the crankcase, which is die-cast in one piece with the cylinder barrel, like the 29, but is without a detachable rear cover, this being integral complete with air-intake. The front bearing-housing encloses two high-speed ball journal bearings carrying the counterbalanced crankshaft and a taper collet drive to the airscrew is used as in the case of the 29. Bore and stroke of the engine are .640 in. and .620 in. respectively and compression-ratio approximately 8.5 : 1.

The " 15 " (2.48 c.c.) retains the same bore as the " 19 " with the stroke reduced to .468 in. General construction of the unit is similar to that of the 19. It is, of course, essentially a racing unit and peaks its output at around the 16,000 r.p.m. mark—well above that of any current 2.5 c.c. design. Prototype units have shown outputs exceeding one-fifth h.p. at these speeds, although it is expected to further improve on this in the final production design.

The New Yulons

Few model engines have enjoyed such a rapid rise to fame as the 5 c.c. Yulon 30 glow-plug engine. Of relatively simple, yet original, design, this engine displayed outstanding qualities which marked its success as a stunt engine.

It is particularly interesting, therefore, to see that two new Yulon models have recently been developed and should be well advanced in the production stage, when this appears. These new engines are the " 29 " and " 49," of 4.9 c.c. and 8.2 c.c. respectively. In the case of the " 29," bore and stroke have each been reduced by .003 in. to .743 in. by .688 in. from those of the " 30," so that the capacity is now within the



CLASS I SPEED MODEL – 1.49cc ALLBON-JAVELIN ENGINE.

.30 cu. in. limit and should thus be of greater interest to enthusiasts overseas, where the cubic inch system of engine classification for competition work is in force.

The .49 engine retains the same stroke as the 29, the bore, however, being increased to .960 in. and giving the very low stroke/bore ratio of slightly over 0.7 : 1. The weight of this engine is at the exceptionally low figure of 6½ oz.—a record for a unit of 8 c.c. capacity.

The writer's experience of Yulon engines commenced early in 1949 when one of the first production 30's was b.h.p. tested for the makers. Later, this engine was installed by my brother in a somewhat overweight " Super-Looper." The engine on this particular design is installed upright, but with a balloon tank correctly positioned and the Yulon running at 10,000 r.p.m., any manoeuvre can be performed without protest from the engine. From the point of view of appearance, an inverted engine is preferred and this layout has been used on the writer's semi-scale stunt design shown in the 3-view drawing.

Using a fixed u/c, extra points can be gained under the stunt schedule and both the take-off and inverted manoeuvres (Look ! he's upside down !) are more satisfactory from the spectator point of view. If 5 m.p.h. or so are lost on level flight speed, this may be all to the good. A fair rule for sensible stunt model speeds in any weather is, we find : line length in feet=m.p.h., with a permissible increase of 10 m.p.h. on this. Thus a 5 c.c. model on 60 ft. lines should do 60 m.p.h. and not more than 70 m.p.h. Nothing looks worse than a short-coupled symmetrical u/c-less model bucking around at high speed on short lines, so that no one can tell what it is supposed to be doing, or which way up it is.

THE aim in designing the "Ace of Diamonds" was to produce a rubber-driven lightweight that was different in appearance, without, if possible, any loss in performance. The results have been very satisfactory, the model being capable of making a vertical climb—if such a method of ascension be your choice. It is not an ultra-lightweight and is, in fact, pretty tough.

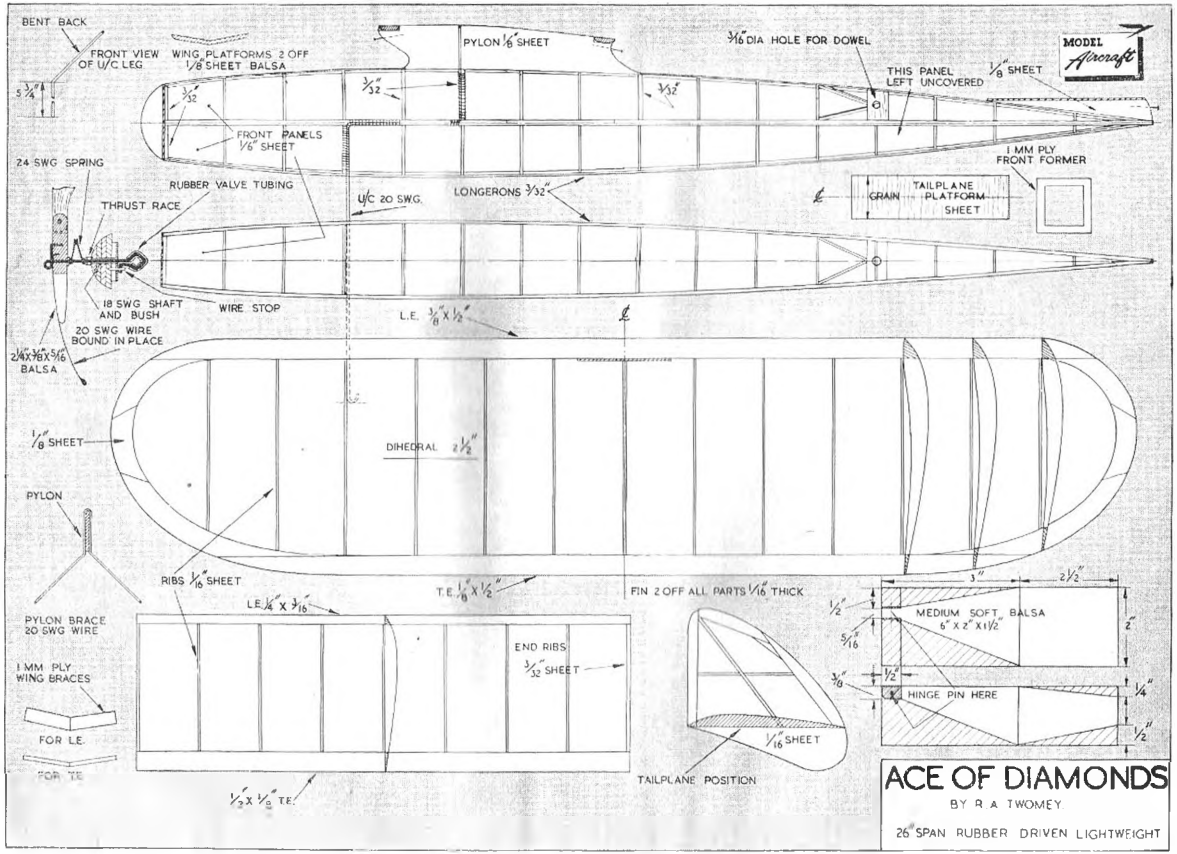
The "Ace" is very versatile and the prototype has also been fitted with a Jetex 200 unit by way of variation. This change is easily effected by the removal of the rubber motor and the substitution of a glider nose-block for the propeller assembly. The Jetex unit is mounted forward over the mainplane, the centre section of which is protected by a piece of asbestos paper. This Jetex version flies very well indeed and holds the Ampleforth College M.A.C. record for this type with a flight of 5 min. 52 sec. o.o.s. The rubber-driven version also holds a club record in the rubber category, clocking 9 min. 30 sec. before going o.o.s. vertically overhead.

The construction of the "Ace of Diamonds" is so simple that building instructions are hardly necessary. The fuselage is made in the usual way on the plan and the only point requiring special mention is that the positions of the 3/32 in. square spacers should be noted, most of the spacers being $\frac{1}{16}$ in. square. The wing platform is braced with 20-s.w.g. piano wire shaped as shown on the plan.

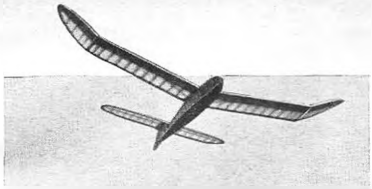
As with any duration model, particular attention should be given to the propeller. This is carved from a balsa block 6 in. × 2 in. × 1$\frac{1}{4}$ in., and should be left fairly thick until trimming tests have been carried out. If the model tends to be nose heavy the propeller can then be sanded to a thinner section to obtain the correct balance. Make sure that there is no vibration in the whole propeller assembly—this is very important. Trim for right-hand glide and climb.

List of materials required :—

4 lengths 3 32 in. × 3 32 in. × 36 in.
3 „ $\frac{1}{16}$ in. × $\frac{1}{16}$ in. × 36 in.
1 „ $\frac{3}{4}$ in. × $\frac{5}{8}$ in. × 36 in.
1 „ $\frac{1}{2}$ in. × $\frac{3}{8}$ in. × 36 in.
1 „ $\frac{1}{16}$ in. × 3 in. × 18 in.
(All the above hard balsa)
Block (medium soft) balsa 6 in. × 2 in. × 1$\frac{1}{4}$ in.
Small piece 1 mm. ply.
20-s.w.g. piano wire.



FULL SIZE WORKING DRAWINGS ARE OBTAINABLE FROM YOUR LOCAL DEALER, OR BY POST FROM THE "MODEL AIRCRAFT" PLANS DEPARTMENT, 23, GREAT QUEEN ST., LONDON, W.C.2. 3s. 3d., POST FREE.



Northern Notes

★ THE NORTH seems to be cursed with bad weather for de-centralised comps. and the Keil Trophy was again no exception. In my district it poured until 1.30 p.m. and the remainder of the day was 10/10th low cloud and a strength 4 wind. In spite of all this about twenty members of the Leeds club travelled to York to have a bash. Ratios were low, but spirits undaunted, the weather notwithstanding. A keen bunch these Leeds lads, they send a contingent to York for practically every contest and are reputed to have the highest entry per member ratio in the north. York, who have the best ground in the north in their lap, average about .005 entries per comp. ! Wake up at the front there ! !

➢ ➢ ➢

★ AFTER ALMOST a week of beautiful sunshine the weather man once more turned his back upon the Northern Area's Weston & A/2 Events. Once again it was 10/10th low cloud and a steady 25 m.p.h. cold breeze ; all in all, not a nice flying day. In spite of the conditions a fair crowd of fliers turned out, and one or two even managed to contact the elusive thermal.

Perhaps the biggest surprise of the day was the Sheffield club's swamping of all the opposition in the Nordic event, they managed to collect the first six places without any difficulty, in fact only two other clubs figured in the first twelve. Genial Chas. Exley took top honours, with a scant two-fifths sec. margin over his club mate F. W. Walker. Others in the top twelve were Jimmy Walker of Darlington (who would have been much nearer the top if he hadn't lost his model on a 19 min. flip) Stan Eckersley and Bracegirdle of Bradford.

In the Weston, Vic Duberry of Leeds again put in some steady flying to top the list with 615 sec., followed by a fast improving newcomer, Rutter of Harrogate. Vic's immense keenness is borne out by the fact that he has already completed his next year's Wakefield, a beautifully finished job weighing just under four ounces bare. Made my 8¼ oz. job look like a Woodcock (mine flies like one too ! !) The Leeds club came out well with Cameron and Tubbs fourth and fifth. Stan. Eckersley was well up there, third ; and Ted Muxlow, after a very bad start entailing some slick repairs managed to retreive his fortunes in his second and third flights, finishing sixth. Given a really good flying day, there is no doubt that some of the Northern Area Wakefield lads are as good as any in the rest of the country.

➢ ➢ ➢

★ IN SPITE of all the publicity, appeals, and even warnings, to modellers, I notice the clots are still with us. Such endearing habits as walking across growing crops, launching power jobs and flying yo-yos in the path of competition models will always make your club mates love you more. Can anyone give me an explanation why people do these things ? It surely can't be ignorance of the fact that they are doing wrong, since it has been pointed out time and time again that they *are* the wrong things to do. If a chap has the ability to build and fly a model it can't be mere stupidity, or can it ? Is it just plain irresponsibility and " couldn't care less," or is it some germ that bites people immediately they get on some one else's flying ground ? You tell me ; which ever it is, the next offender in the Northern Area is in for a big shock. Don't say you haven't been warned ! !

Miller of Bradford at the take-off during the N.W. Area Weston Cup event.

★ I SUPPOSE just to confound my gloomy remarks re the notorious Northern weather, the Nats. at York, will be flown in blazing sunshine with bags of thermals (and lost mods.). Then no one will ever believe that our poor times are really due to bad conditions and not to generally poor flying. By the time this appears, the 1950 Nats. will be a thing of the past and the N.A. Officials will be able to settle back and relax. I expect there will be the usual amount of moans and groans about the meeting, but I can only say, wait till your own Area has to do it chum. It's amazing how it finds out the passengers.

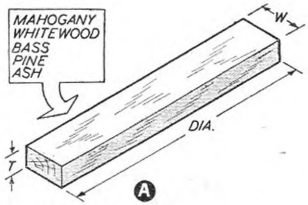
➢ ➢ ➢

★ THERE SEEMS to be a general complaint amongst Area secretaries that most of the work in areas is left to the few willing clubs, whilst too many are prepared to sit back and wait for things to be done for them. Time and again, I hear of committee meetings attended by the same eight or ten delegates : and in spite of publicity, and even direct letters there are still too many clubs who will not bother to send a representative to these meetings. The same tale is told of Area flying meetings ; plenty of people who want to fly in the comps. but when it comes to a bit of assistance in running same, the response is very poor. Vic Duberry, the Northern P.R.O. points out in a recent newsletter that every entrant in a competition utilises the service of six timekeepers (for his three flights), therefore, to share out the work as it should be shared, every entrant should, in all fairness time six other flights. But how many do ? There is far too much of a " let the other silly so and so's do the work we've come for a day's outing," attitude. Very soon those blokes who expect to go to comps. and find everything laid on for them will be finding there are no comps. to go to. In passing, have you ever noticed that there always seems to be plenty of the " experts " and " big names " willing to do their stuff with the stop watch ?

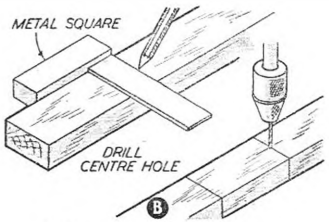
Stan Eckersley of Bradford gets his model away well in the Weston Cup Contest.

★ FINALLY, A note of warning. The number of badly lacerated fingers caused by close contact with rapidly revolving props seen at rallies seem to be on the increase. I saw recently three bods, whose gore-dripping hands told a tale of carelessness, and one at least had to be dashed off to the hospital somewhat rapidly. Modellers, beware ! The loss of two or three fingers is no aid to rapid model building, nor is the wrapping of these somewhat nasty wounds with the usual filthy and fuel stained rags conductive to good healing. It would seem that soon, in addition to control points, tea stalls, and what have you, Area Committees will be faced with the prospect of laying on a mobile operating theatre and surgeons.

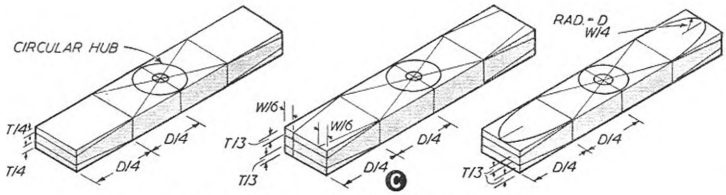
Harry Clegg's splendid B26 Marauder flew well at the recent N.W. Area Meeting. Powered by two Mills 2.4 engines and fitted with detailed cockpits, landing lights, etc.



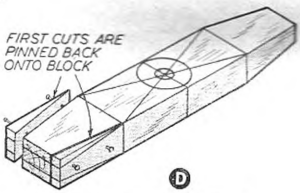
Choose good material for prop. block.



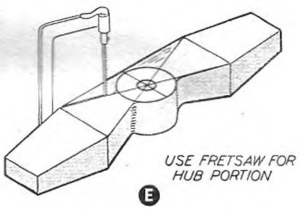
Mark out carefully, drill centre hole.



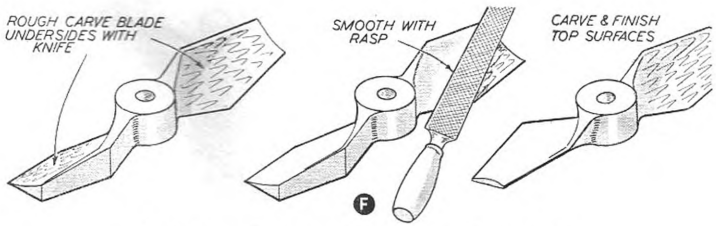
Three of the most popular methods of laying out the blank.



End cuts are made with a hand saw.



Fret-saw will get round hub portion



Carving is hard work, but not very difficult if the proper tools are used.

How to make it

NO. 6. POWER MODEL PROPELLERS

(A) Carving power model props. is much harder work than making a rubber model prop. from balsa. Commercial props., however, cost quite a bit of money, and if your spare cash is limited, it is worth a try. Choosing the best wood in the first place will make the job easier. Some hardwoods carve much more easily than others. Really tough, or badly grained woods should be avoided. The woods listed are quite good, also poplar. But birch, beech, oak, etc., will raise a lot of blisters ! Get the wood cut to proper block size, if possible.

(B) Proportions of the block determine the *pitch* of the finished prop. Pitch for any dimensions can be calculated, but by far the simplest way is to make the width (W) equal to either 10 per cent. or 7½ per cent. of the diameter. Use the higher figure for stunt and free-flight props., the 7½ per cent. width for speed. Block *thickness* (T), for various pitches is then given below :—

Pitch —	4	5	6	7	8	9	10 in.
W = 10% D	¼	5/16	⅜	7/16	33/64	37/64	41/64 in.
W = 7.5% D	—	—	9/32	7/16	64	½	77/64 31/64 in.

(C) There are several ways of laying out the propeller blank. The two most popular use square cuts. To get the same pitch throughout the blade, thickness of the block must be reduced towards each tip. If the *width* remains unaltered, *tip thickness* must be reduced to one-half, as on the left-hand figure. This taper can be taken off top and bottom of the block as shown, or off the top only (giving a swept-back or swept-forward blade, depending on which way round the blank is carved).

Sometimes the blade width is decreased towards the tip—especially on speed props. Tip thickness must then be reduced still further, the average figure being one-third of the full thickness.

A curved blade form is given by plotting a curved plan shape as shown on the right-hand figure. Simply draw the semi-circular ends with a radius equal to one-quarter of the blade width and join up to the widest portion of the blade at D/4. Almost invariably power props are laid out by dividing the block into quarters.

Whichever layout you choose, draw all the cutting lines accurately, and on all faces of the prop block, even across the ends.

(D) In cutting out the blank, make the end cuts first. With a tapered or curved plan shape, the parts initially cut off should be pinned back temporarily as these carry the cutting lines for the tip thickness taper. The same holds true whether you cut the top or the side wedges off first. In the parallel chord layout, of course, there are no width taper cuts at the tip, so simply cut the tip thickness tapers.

(E) To get round the hub portion accurately it is best to use a fretsaw or a small scroll saw. Don't take any chances by hacking away with a knife down to vertical saw cuts. Your guide cuts may go too deep and weaken the hub.

When the blank has been completely cut out, check that it is absolutely square. You can, at this stage, drill the centre hole out to the required diameter.

(F) Now comes the really hard part of the work—carving the blades to section ! Just as with a rubber prop., carve the undersides first, taking as much wood away as possible with a very sharp knife. Some people prefer to use a spokeshave, holding the blank in a vice or suitable clamp, and this is certainly less tiring. The main secret is a very sharp cutting edge on whatever tool you use.

Once the blade undersurfaces have been carved to rough shape you can smooth out the rough cuts and virtually finish the surface with a rasp. However, a final working over with sandpaper will be necessary.

Carve the upper surfaces in a similar manner, using a rasp and sandpaper to finish again. Blades should be carved reasonably thin, but without undercamber. Trim off any sharp edges and check that each blade is the same shape.

Balancing is important. The prop must be mounted on a shaft the same diameter as the hole through the hub and then balanced on a couple of knife edges, removing material from the heaviest blade, as required. However, almost as good is to balance the prop on a knife blade under the *exact* centre.

Finally, you should give your prop a coat of varnish or fuel proofer to prevent it soaking up oil, and consequently weakening itself, during use.

Over the Counter

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

SUBJECT of our kit review this month is *gliders*. We have been told that glider kits are not a commercial proposition, yet going back some three years we list seventy different types which have enjoyed a considerable popularity and a good proportion are still available through the normal retail channels. Those kits which we know to be definitely out of production and not now available (i.e. stocks exhausted), we have indicated.

Main point in these kit tables is to provide a sort of "Buyer's Guide" for our readers. No model shop can afford to stock all the available kits—there would hardly be space for one thing—but the dealer can usually obtain a specific kit which he does not normally carry, if requested.

Significant point of the new glider kits is that both of the latest additions to the range are to the new A-2 "Nordic" specification—a class of model which, by all appearances, promises to be very popular. Both are described on the opposite page.

* * * *

Those two new *Tulon* motors—the "29" and "49"—should please all control line fans. Class IV Speed (5-8.5 c.c.) has rather been in a rut. Unless you owned a McCoy "49" you just did not stand much chance in competition. Now, for just sixpence less than a fiver, we have the British answer. And that's less than you would pay for a McCoy—if you could get one!

* * * *

Last month we gave some notes on *Modelspan* tissue. Now we learn of another addition to the colour range—*black*, which is at present available in lightweight *Modelspan*, only.

We have known for some time that *E.D.'s* have had something up their sleeves, and now they have just announced the introduction of their new miniature radio control equipment.

Outstanding features are the weight (only $7\frac{1}{2}$ oz. for the receiver, escapement and batteries), and the inclusion of all the necessary auxiliary components, including: double on-off switch, meter, four-pin battery plugs and sockets, and even a coil of solder.

At the low price of £– 19s. 6d. for the complete outfit it seems assured of a ready sale.

* * * *

In the 1950 South African National C/L Championships held recently a fine boost for British products was given by *Stunt Props.*, which were used by the first three place winners in each of the Speed (4 classes), Stunt, and Flying Scale events.

No wonder the South African boys are enthusiastic about this outstanding performance.

* * * *

There cannot be many modellers who did not see a copy of *Keilkraft's* 1949 Catalogue—a veritable handbook in miniature. Work is already well advanced on the 1950 Handbook, which is almost certain to be considerably bigger this year. We are assured however, that even if it grows to 100 pages it will still not cost more than ninepence, and perhaps even less.

* * * *

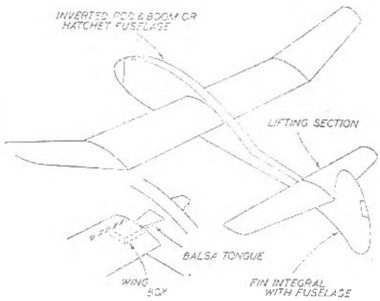
This handbook is always timed to come out in time for *The Model Engineer Exhibition*. 1950 will see the 25th exhibition of its kind, and the 3rd in which model aircraft has been a leading feature. Besides the usual competition entries and S.M.A.E. displays, traders who have so far booked stands include Messrs. Keilkraft, Mercury Models, and Cartwrights Model Supplies.

ROMA

It is rather unusual to find a lightweight glider of the "hatchet" fuselage type, and still more unusual to find a lightweight with a tongue-and-box wing fitting. This new *Halfax* kit model, however, has both these features.

Designed by John Magson, span is 40 in., wing area 157.5 sq. in. and total weight 3 oz. To bring up to F.A.I. rules for contest work, if required, about $1\frac{1}{2}$ oz. of extra ballast must be added in the fuselage around the the actual c.g., which should have little or no effect on performance.

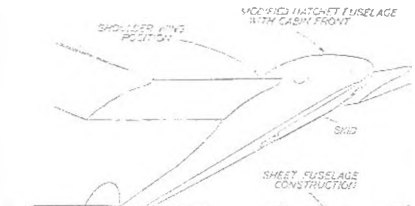
This model should prove a stable, reliable flier. Towhooks are offset to the right, so that tab offset can be used for a glide circle. Wing section is of conventional thickness.



NORSEMAN

Ever since designer Guilmont started building gliders with pod-and-boom fuselages up the "wrong" way he seems to have stuck to this layout. But there is no doubt that the hatchet-type fuselage is part-answer, at least, to good towline stability. In his latest design, too, fuselage lines are not so exaggerated and a cabin nose is incorporated. Designed to *Nordic* specification, this *Mercury* kit model should prove very popular—and a real competition threat.

Structurally the fuselage is most interesting, being built on a form of sheet crutch. This provides for accuracy and speed in building, reasonably light weight and extreme toughness. Wings and tailplane are rectangular in planform.

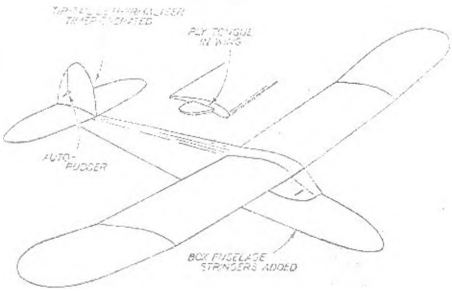


CLIO

This is another *Nordic* glider—a new Keilkraft kit designed by Bill Dean. One thing we can vouch for on this model is the really excellent towline stability, as demonstrated in the rough weather at the Surbiton Glider Gala.

The prototype, with generous dope trimming, weighed slightly over 16 oz. So anyone building this design for contest work would be well advised to keep the weight down during construction.

Fuselage is very similar in appearance to Bill Dean's other cabin designs, but a tongue and box wing fitting is used. Stout ply tongues are located in each wing half, plugging into a well braced fuselage box. Gadgetry includes an auto-rudder (peg operated) and tip-tail dethermaliser tripped by an Elmic timer. Span is 63 in. Weight 16 oz. Wing section NACA 6412.



GLIDER KITS

This table embraces glider kit models manufactured in reasonable quantities since January, 1947, and those kits known to be now out of production or not normally available are indicated. Whilst every care has been taken to make this table as complete as possible, no responsibility can be accepted for errors or ommissions.

Span ins.	Model	Designer	Manufacturer	Type	Special Features	Price
12	ATO ELF*	—	Ato Model Crafts	Solid	Chuck-Glider	2/-
12	ZIPPER	—	Halfax Models	Solid	Chuck-Glider	1/3
12	TOMTIT	—	Model Aircraft (Bournemouth)	Solid	Chuck-Glider	1 6
12	VEGA	W. A. Dean	E. Keil & Co.	Solid	Chuck-Glider	1/3
12-18	TRIPLET	C. H. Saunders	21st Century Products	3 alternative designs	—	4 -
12½	SPOOK	W. A. Dean	E. Keil & Co.	Solid	Tailless Chuck-Glider	1 6
14	MIDGE*	R. H. Warring	British Model Aircraft	Semi-Solid	Profile Fuselage	1 3
16	DART*	J. R. Vanderbeek	International Model Aircraft	Solid	Chuck-Glider	2 6
16	GNAT	W. A. Dean	Elite Model Airplane Supplies	—	—	2 6
18	SWIFT*	—	Model Aircraft (Bournemouth)	Solid	Tailless Chuck-Glider	1 9
18	SQUIRREL	—	Don Models	Solid	Chuck-Glider	2 6
20	SWIFT*	—	British Model Aircraft	Solid	Chuck-Glider	2 6
20	JEEP*	J. Passmore	British Model Aircraft	Semi-Solid	Chuck-Glider	3 6
20	WIZARD	—	Halfax	Solid	Chuck-Glider	2/6
20	POLARIS	W. A. Dean	E. Keil & Co.	Solid	Chuck-Glider	2 6
20	CUB	W. A. Dean	E. Keil & Co.	Cabin	Also Jetex "50" Powered	2/-
21	GREMLIN	—	—	—	Twin Fin	3 -
22	WREN*	—	Model Aircraft (Bournemouth)	Solid	Chuck-Glider	3 -
24	WIZARD*	R. H. Warring	British Model Aircraft	Pod & Boom	Built-up Wings	3 -
24	MAGPIE	H. J. Nichols	Mercury Models	Cabin	Begginer's Model	3 9
26	COMFIT	W. A. Dean	E. Keil & Co.	Solid	Chuck-Glider, Polyhedral Wag	3 6
26	HI-FLY*	R. Calvert	Hi-Fly	Semi-Solid	Alt. Single or Twin Fin	10 -
27	BENNY	—	Don Models	High Wing	Slabsider	3 6
30	HERON*	—	Elite Model Airplane Supplies	Cabin	Gull Wing	5 -
30	SUNBEAM	—	Warnesford	Tailless	Built-up	5 6
30	WAGTAIL	—	Model Aircraft (Bournemouth)	Pod & Boom	U-Tail	5 -
30	ATO "30"*	—	Ato Model Crafts	Cabin	Slabsider	4 6
30	WARRIER*	C. H. Saunders	Worcraft	Cabin	—	6 -
30	CADET	W. A. Dean	E. Keil & Co.	Cabin	—	4 -
30	FAIRY	J. R. Vanderbeek	International Model Aircraft	Cabin	—	7 6
30	ELITE NO. 1.	R. H. Warring	Elite M.S.A.	Beginners	Triangular fuselage	6 -
31	BEAU GLIDER*	A. H. Lee	Model Airport (Bristol)	Cabin	Short Moment Arm	5 6
31	BABY GULL	R. F. L. Gosling	Aeromodels	Cabin	Semi-streamlined	8 3
32	VENTURA	E. Chasteneuf	Chas. Models	Cabin	Streamliner	12 -
34	MANX CAT	—	Airyda	Tailless	—	10 -
34	NORTH WIND	—	Airyda	—	—	5 -
36	WEST WIND	—	Airyda	—	—	6 -
36	3-ROUTER	R. H. Warring	British Model Aircraft	Solid	Propue Fuselage	5/-
36	SOARER BABY	C. H. Saunders	E. Keil & Co.	Cabin	—	5 -
36	SOUTHERN SLOPER	L. Heath	Southern Junior Aircraft	Pylon	Diamond Fuselage	6 6
36	DIANA	C. T. Buffery	International Model Aircraft	Cabin	—	—
36	CORINTHIAN	—	Warnesford	Cabin	Polyhedral Wing	5 6
38	PEEWIT	A. H. Dadd	A. E. Peters	—	Lightweight	10 6
39	SUNNAWIND	—	Paramount Model Aviation	Contest	Lightweight	10 6
40	SAILPLANE*	—	Chingford Model Aerodrome	—	—	12 6
40	INVADER	L. Heath	E. Keil & Co.	Cabin	Twin-Fin	6 6
40	TARN	R. F. L. Gosling	Halfax Models	Cabin	High Tail	10 -
40	UANDA	J. R. Vanderbeek	International Model Aircraft	Cabin	—	9 6
40	SUNDUSTER	—	Airyda	—	—	7 6
40	ROMA	J. Magson	Halfax Models	Hatchet	Lightweight Contest	7 6
40	BEAU GLIDER*	A. H. Lee	Model Airport (Bristol)	Cabin	Short Moment Arm	7 6
40	ASCOT	E. Chastenuef	Chas. Models	Lightweight	Streamliner	8 6
40	ARNHEM GLIDER	Aeromodeller	E. Law & Sons	Beginners	Slabsider	14 6
40	GAMMA	—	Chingford Model Aerodrome	Lightweight	Diamond Parasol	12 6
42	ALBATROSS	—	Model Shop, Newcastle	Pod & Boom	Semi-cradle	10 6
42	GILI-CHOPPER	P. Guilmont	Mercury Models	Hatchet	R.A.I. Contest	12 6
42	KIWI*	—	Model Aircraft (Bournemouth)	Tailless	—	18 6
42	MARLIN*	—	Model Aircraft (Bournemouth)	Cabin	—	8 6
44	GULLDUN	—	Don Models	Cabin	Gull Wing	7 6
48	SOARER MINOR	C. H. Saunders	E. Keil & Co.	Cabin	—	8 -
48	FORTUNA	C. T. Buffery	International Model Aircraft	Contest	Shoulder-Wing	—
48	CLUB CONTEST*	—	Model Aerodrome	—	—	15 6
50	BEAU GLIDER*	A. H. Lee	Model Airport (Bristol)	Cabin	Short Moment Arm	9 6
50	MINIMOD	C. H. Saunders	E. Keil & Co.	Scale	Gull-Wing	7 -
50	WRAITH*	R. H. Warring	Shaws Model Aircraft	Contest	Shoulder-Wing	25 -
52	ATO "52"*	—	Ato Model Crafts	—	Shoulder-Wing	18 -
52½	20-MIN GLIDER*	E. Chasteneuf	Premier Aeromodel Supplies	Contest	Shoulder-Wing	19 4
56	WANDERER*	D. Cookson	Elite Model Airplane Supplies	Contest	Shoulder-Wing	11 1
60	SOARER MAJOR	C. H. Saunders	E. Keil & Co.	Cabin	—	11 6
60	CONTEST GLIDER*	R. H. Warring	Shaws Model Aircraft	Contest	Slabsider	10 6
60	BUZZARD*	—	Model Aircraft (Bournemouth)	Slabsider	High-Wing	13 6
60	PRINCE	C. T. Buffery	International Model Aircraft	Cabin	Streamliner	—
—	NORSEMAN	P. Guilmont	Mercury Models	Hatchet	A-Z Contest	17 6
—	GIPSY II	C. H. Phillips	Premier Aeromodel Supplies	Shoulderwing	—	15/10
64	CHIEF	W. A. Dean	E. Keil & Co.	Cabin	A-Z Contest	—
66	ALBATROSS	H. Austwick	Halfax Models	Cabin	High Aspect Ratio	25 -
84	WINDJAMMER*	R. Slater	Premier Aeromodel Supplies	Cabin	High Tailplane	30 -
94	ALBATROSS II*	R. Munney	Luton Model Aircraft Supplies	Contest	High Aspect Ratio	36 -

* No longer in production.

M.A. Engine Tests

No. 13—THE MILLS 1.3 c.c. Mk. II

IN contrast to the larger and more powerful types of model engines which have been dealt with in the last few Engine Tests, this month's report features a popular small diesel, the 1.3 c.c. Mills.

The original Mk. I Mills 1.3 was, of course, one of the very first British-made compression-ignition engines to appear. Well constructed and easy to handle, it sold in many thousands and it is probable that, in the past, more modellers made their first power flight with a Mills Mk. I than with any other type.

The present Mk. II model was introduced in the summer of 1948 and is an improvement on the earlier engine in many respects, being both lighter and more powerful. New materials have given it a very long useful life and the excellent finish, which has distinguished all Mills models, has been maintained.

Unlike the majority of engines tested in this series, most of which have had little or no previous use, the particular Mills Mk. II dealt with was purchased some fifteen months ago and has had a considerable amount of use in various models. These have included an 8-oz. 147 sq. in. stunt model—which, incidentally, proved fully "stuntable" with this engine—a small speed model and a 40 in. power/duration model. The engine is now normally used in the latter machine (which it takes up sufficiently fast to give a performance comparable with the best in power/duration models) but, on occasions, is returned to the small stunter for the benefit of learners, who are then encouraged to do their worst. All this the Mills takes in its stride and has never given a moment's trouble.

Specifications

Type : Single-cylinder, air-cooled, three-port, two-cycle compression-ignition. Single inlet and transfer passages, twin exhaust ports. Step type deflector milled in piston crown.

Swept volume : 1.33 c.c. Bore : 0.406 in. Stroke : 0.625 in.

Compression : variable. Stroke Bore ratio : 1.54 : 1.

Weight : 3½ oz., including free-flight tank.

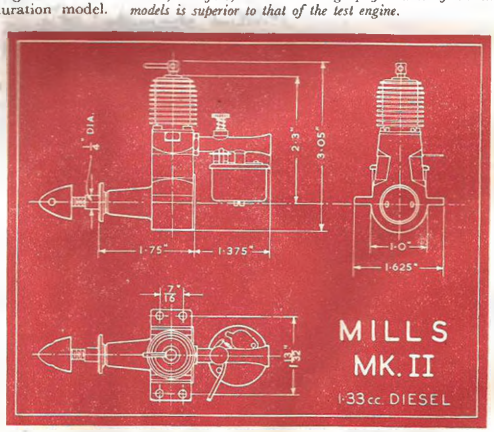
General structural data : Magnesium crankcase and main bearing housing with detachable rear cover-plate. Nitralloy steel cylinder-liner, flanged and secured to crankcase with four cheese-head screws. Piston material not disclosed. Unbushed connecting-rod of hiduminium RR. 56 alloy. Fully floating gudgeon-pin. Case-hardened steel crankshaft running in divided phosphor-bronze main bearing. Dural cylinder head/barrel threaded on to liner. Carburettor assembly may be rotated and locked in any position for inverted or side-mounted operation. Self-resetting air-bleed type cut-out. A detachable transparent bowl-type fuel tank for free-flight use is fitted.

Test Engine Data

Total time logged prior to test : 8 hours (approx.).
Fuel used : "Mercury No. 3."

Performance

NOTE—*Although identical in appearance with current production Mills Mk. II engines, the test engine (Serial No. 21839) differs in that all models from No. 26460 upwards, have improved cylinder porting. It may be assumed, therefore, that the average performance of current models is superior to that of the test engine.*

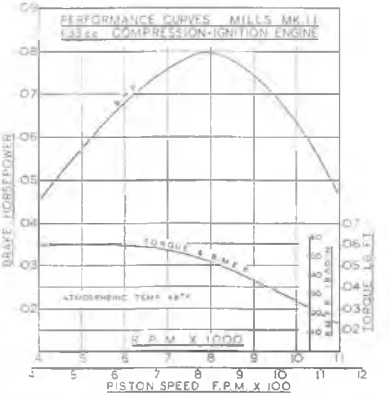


As already stated, the engine had an appreciable amount of running before the test and no further running-in was, therefore, necessary. Thirty to sixty minutes running are advised for Mills engines, by the manufacturers, before full performance can be expected and revs. were kept down during this period. At no time, prior to the test, however, had speed exceeded 8,000 r.p.m. (7-8,000 r.p.m. being the normal speeds at which the engine had been operated in models with 8× 6 and 8 × 8 propellers) with the exception of a few short runs at 9,000 r.p.m. in the speed model.

All Mills units are noted for their easy starting qualities, and, of course, no trouble in this direction was experienced during the tests. Priming through the ports is not required with the Mills and preliminary starting procedure, from cold, is confined to two or three flicks with the carburettor intake choked, after which the engine normally starts within another two or three flicks. Thereafter, a single choked flick and one starting flick is normally all that is required to re-start the engine when the correct control settings have been determined.

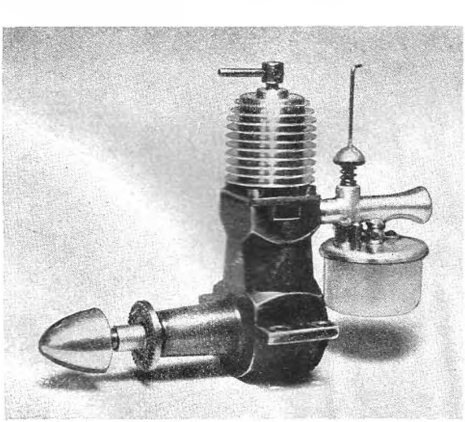
For the torque tests, the engine was run at speeds ranging from 3,000 to 11,000 r.p.m. The Mk. II, of course, is not a high speed engine, and no useful purpose is served by pushing revs. above the latter figure, where power drops off appreciably.

On the other hand, the engine is very flexible at the lower end of the speed range and has a particularly useful amount of power, for its capacity, available near the 5,000 r.p.m. mark. This is due to the relatively high torque developed by the engine, which is at its peak at around this speed. A practical illustration of this is also given by the engine's ability to turn a sizeable airscrew smoothly at an even speed and an 11 × 5 free-flight propeller of medium blade area was, in fact, checked at 4,450 r.p.m.



Beyond 6,000 r.p.m., torque drops off at an increasing rate, and, as a result, maximum power is reached at approximately 7,900 r.p.m. An output of just under .08 b.h.p. was recorded at this speed. This is equivalent to a specific output of 60 b.h.p./litre, and, although very slightly less than that obtained from the Mills' 2.4 and .75 models, is, nevertheless, equal to that obtained with other medium speed i.c. engines.

Because of its useful power output at medium revolutions, the Mills is well suited to free-flight semi-scale models where, for a given engine size, wing areas and weight are rather greater and where larger diameter, slower revving propellers are required. At the same time, ample power is available at around 8,000 r.p.m. for power duration work. Airscrews ranging from 10 × 5, for semi-scale, to 8 × 6, for high-performance power/duration, models, are suggested.



For stunt work, a speed of 8,000-8,500 r.p.m. in the air should be aimed at and an 8 × 8 propeller will usually be found suitable.

Due to its versatility, which makes it equally suitable for C/L or competition free-flight, as well as for general-purpose work, combined with extremely easy handling, and trouble-free service, the Mills Mk. II can be recommended, with confidence, to experienced modellers and novices alike.

Power/Weight Ratio : (As tested) .366 b.h.p./lb.

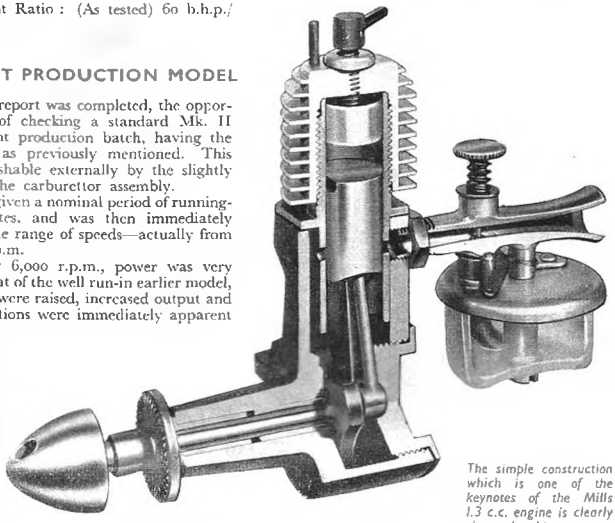
Power/Displacement Ratio : (As tested) 60 b.h.p./litre.

THE CURRENT PRODUCTION MODEL

Since the above report was completed, the opportunity has arisen of checking a standard Mk. II unit from a current production batch, having the improved porting as previously mentioned. This feature is distinguishable externally by the slightly lower position of the carburettor assembly.

This engine was given a nominal period of running-in of thirty minutes, and was then immediately checked over a wide range of speeds—actually from 3,500 to 13,500 r.p.m.

At speeds below 6,000 r.p.m., power was very slightly down on that of the well run-in earlier model, but, as revolutions were raised, increased output and higher peak revolutions were immediately apparent in the manner in which a constant torque was maintained up to nearly 9,000 r.p.m. The shape of the torque curve is, in fact, now completely altered, and results in greatly increased performance at speeds above 6,000 r.p.m.



The simple construction which is one of the keynotes of the Mills 1.3 c.c. engine is clearly shown in this cut-away illustration by our staff artist, G. M. Lewis.

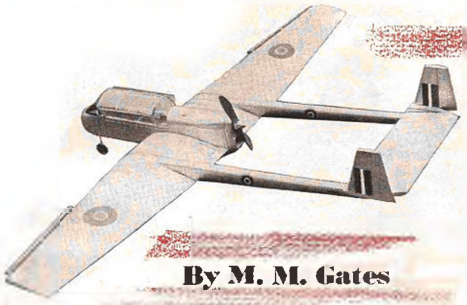
The accompanying table shows the actual figures recorded, in steps of 1,000 r.p.m., between 4,000 and 12,000 r.p.m. The peak b.h.p. is now indicated at approximately 10,600 r.p.m., where a figure of 0.108 b.h.p. is reached. These, of course, are very good figures and especially so for a long-stroke 3-port type engine. The specific output of over 80 b.h.p./litre is particularly noteworthy, equalling, as it does, average values obtained for high performance diesel, and certain glow-plug engines, which have come to be regarded as strictly "competition" types.

An interesting practical demonstration of the nature of the improvement in power output was given when the engine was checked on various airscrews previously employed with the earlier Mk. II which resulted in increases of up to 1,000 r.p.m. with the new engine.

The extremely easy starting and handling characteristics of the earlier models are not impaired. Power/Weight Ratio : (as tested) 0.494 b.h.p./lb. Power Displacement Ratio : (as tested) 81 b.h.p./litre.

B.H.P. CHECK—MILLS Mk. II. 1.3 c.c.
1949 50 Model with Improved Porting

Speed	Power Developed
4,000 r.p.m.	0.042 b.h.p.
5,000 r.p.m.	0.055 b.h.p.
6,000 r.p.m.	0.068 b.h.p.
7,000 r.p.m.	0.080 b.h.p.
8,000 r.p.m.	0.091 b.h.p.
9,000 r.p.m.	0.101 b.h.p.
10,000 r.p.m.	0.107 b.h.p.
11,000 r.p.m.	0.107 b.h.p.
12,000 r.p.m.	0.104 b.h.p.



HESTON A.O.P.

By M. M. Gates

WHEN looking for a full-size aircraft which would make a suitable flying scale model with a small diesel engine, the main factors which influenced my choice were :—

(1) Ample wing area to give a slow flying speed.
(2) Adequate lateral stability.
(3) It should have an unusual appearance if possible.

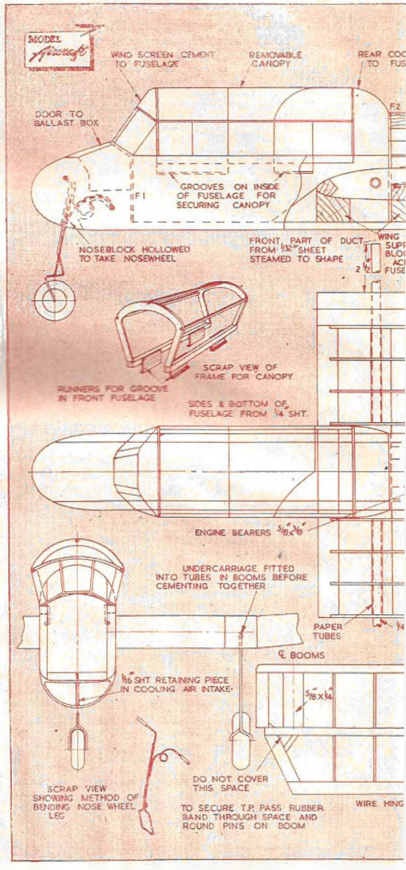
The Heston A.O.P. satisfies the first two considerations because it was designed for slow flying, and the twin-boom pusher layout satisfies the third. The only disadvantage of the design is that the sweepback of the leading edge induces tip-stalling. Since a reasonable degree of washout did not provide a remedy, wing tip slats have been fitted, as on the actual aircraft, with complete success.

It is perhaps right to point out that the model is purely a scale design, so duration fiends can turn to the next pages straight away ! In places the construction has been made unnecessarily strong, so that the scale contour is preserved. In order to be on the safe side as regards strength my model was made mainly of hard balsa. In actual fact good quality medium balsa is amply strong enough, and in particular the resultant lightening of the tail will enable some of the nose ballast to be dispensed with.

The model was designed primarily for the Amco .87 or Mills .75, but has been flown with the E.D. Bee. All up weight with E.D. Bee was 19 oz., but 17 oz. should be easily attainable with the Bee, or 15½ with the Mills. A special pusher propeller is necessary on the Bee, but with the Mills and Amco the direction of rotation can be reversed.

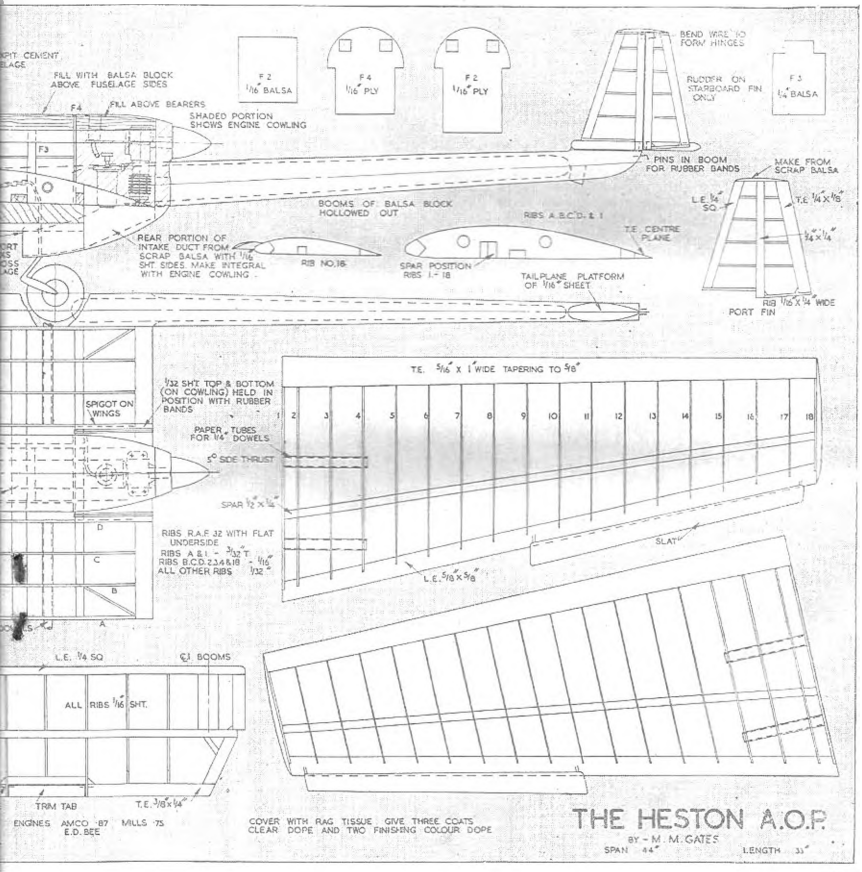
Construction

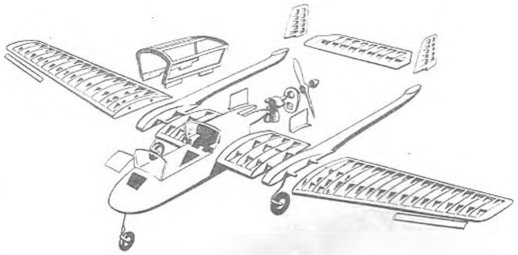
Wings—The outer sections are of straightforward construction, with flat under sides, and can be built on the plan. The spar is tapered in detph from root to tip. The best way to make the ribs is to cut out " master " 1/32 in. root and tip ribs (Nos. 2 and 18). Sandwich 15 pieces of 1/32-in. sheet between these,



and hold together. with pins They can then be cut and sanded to the correct taper quite easily. This set can be used as templates for the ribs of the other wing, and also for those which are made from ⅛-in. sheet. Care should be taken in sanding the leading edge, so that it blends in well with the ribs. Lastly the paper dowel tubes should be added.

Fuselage and centre section—First make the wing centre section over the plan. Cut out the fuselage floor and sides, and rough out the nose block, which should be halved down the centre line so that the undercarriage can be inserted. It should then be cemented together and on to the floor with the "dashboard" former, making sure that they are square with floor. Balsa blocks should then be stuck to the floor to support the leading edge and the three spars and shaped so that the wing lies squarely on them. Add the wing and ply formers, and build up the centre fuselage and engine bearers. Add the fuselage sides, which are cut away to fit over the wing. The





front part of the cooling air intake is made from two pieces of 1/32-in. sheet steamed to shape and cemented together. A piece of $\frac{1}{4}$-in. sheet runs down the centre to retain the shape. The rear part of the duct is integral with the cowling, which is made from pieces of balsa sheet, the sides of $\frac{1}{4}$-in sheet. The cowling is located by small 1/32-in. sheet "wing roots" attached to it and fitting over locating pieces on the inboard wing rib. Bands around the wing roots hold the cowling in position. The nose ballast box door is hidden by making it conform in shape to the black anti-dazzle panel.

The windscreen and rear end of the cockpit are cemented to the fuselage, but the main part of the canopy is cemented to a balsa frame, which is removable. Small projections from the frame fit into grooves inside the fuselage sides and the canopy can be removed by pressing the sides inwards. As the Heston A.O.P. is still semi-secret, I have not been able to obtain details of the cockpit layout, but the crew of two sit in tandem.

Booms—Each boom should be divided into halves down the middle and hollowed out. The undercarriage legs should then be firmly fitted in place and the parts cemented together again. The booms have to be shaped to elliptical section, except where they form part of the wing, and holes drilled for the dowels. Alignment of the dowel holes is not difficult especially if the booms are drilled together. Adjustments can be made by enlarging a hole on one side and filling it with plastic wood on the other.

Tail Unit—The tailplane and fins should be built flat on the plan. A rudder is fitted to the starboard fin only, and carries a balance at the top. The fins are cemented to the tailplane tips, and do not come above the booms.

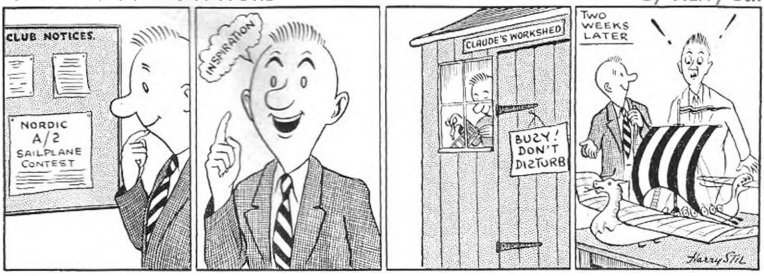
The model takes apart to six major pieces for ease of transport, being joined together by $\frac{1}{4}$ in. diameter *hard* balsa dowels. The tail is held to the booms by rubber bands which pass through holes in the tailplane. The dowels are made of balsa so that they break in a heavy landing rather than the wings.

Finish—The model was covered with rag tissue. It was given three coats of clear and two of silver dope. The "solid" parts of course have to be grain filled first. R.A.F. markings, the serial number VL529 and the prototype "P" marking complete the finish.

Flying

Add ballast to the nose until the centre of gravity comes at the position shown on the plan. Glide test and make slight adjustments to the ballast if necessary. For first power flights slacken compression, and open the fuel needle until the engine will only just run, even if it is rather erratic. Hand launch gently. The A.O.P. should fly about 15 ft., losing height, and make a power-on landing. If your motor will not run slowly, put the propeller on the wrong way round, so that the thrust is low. On successive flights, with five to ten seconds engine run, increase the power very slightly, adjusting the rudder to give a slight turn with torque, until the model shows signs of stalling when the engine stops. You have then reached the best power setting and the model is trimmed.

CLUELESS BUILDS A NORDIC By Harry Stil



S.M.A.E. CONTESTS at FAIRLOP

1. Roy Yeabsley of Croydon " plays " his model on the line. He topped the London Area Nordic A-2 Trials and won the K. & M.A.A. Cup.

2. Despite its steep angle of bank, Bill Dean's " Gypsy " got away safely but failed to qualify for the Wakefield " 100."

3. A. G. Shine of Thames Valley demonstrates how to get a Wakefield away smartly in windy weather conditions.

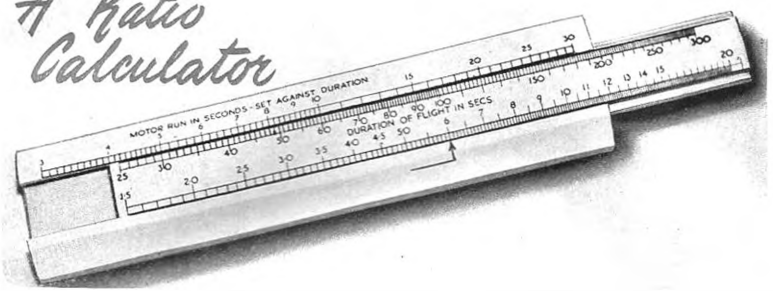
4. D. Yeabsley launching his twin brother's K. & M.A.A. Cup winning Nordic glider for its first flight in the contest.

5. C. T. Buffery of the Northern Heights, a well-known pre-war modeller, made a welcome return to contest flying in the Wakefield Eliminator.

6. The hard worked London Area Competition Secretary, Capt. S. D. Taylor, who, with his assistants, did a fine job of organising.

7. One of the fastest climbing Wakefields seen in the Eliminators. D. G. Marcus of Croydon gets his model away for one of the flights by which it qualified for the Finals.

A Ratio Calculator



THIS simple slide-rule can be made by anyone in a very short time, and the cost is only a few pence. In fact, those odd scraps of balsa lying around in the workshop will almost certainly provide all the necessary material. Nor is any skill needed to use the calculator. The centre or sliding-part is simply adjusted until the appropriate figure of the "Duration of Flight" scale comes opposite the particular motor run, when the reading on the other centre scale opposite the arrow gives the exact flight ratio.

Drawings for a complete set of full size parts are given opposite. First cut all these pieces from hard, unwarped sheet and strip and lightly sand down until perfectly smooth.

The two $\frac{1}{16}$ in. $\frac{1}{8}$ in. side pieces are then cemented to the base, leaving a channel down the centre *exactly* $\frac{3}{8}$ in. wide. The two $\frac{1}{16}$ in. sq. guides can then be cemented in place. Then cement the two pieces comprising the slide together and check that the slide is a nice sliding fit in the body.

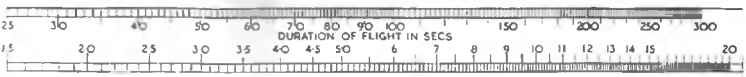
The two scales given at the bottom of the page should then be cut out and cemented in place. Scale "A"—the single scale—is cemented to one of the side pieces, the edge of the scale coming right up to the edge of the $\frac{1}{16}$ in. sq. guide. The slide scale—the double scale—is cemented on top of the slide top.

It now remains to find and mark the position of the arrow mark, against which the required flight ratios are read off. Move the slide until the 100 on the "Duration" scale comes exactly opposite the 10 on the "Motor Run" scale. Mark the arrow or indicator point on the other side exactly opposite the 10 of the bottom slide scale, or ratio scale. Once thus marked, this arrow will then give correct ratios for any combination of motor run and flight duration.

Since the slide-scales are already drawn—and use the scales reproduced below rather than try to copy them—the accuracy of this calculator will rely simply on the accuracy with which the arrow mark is located.

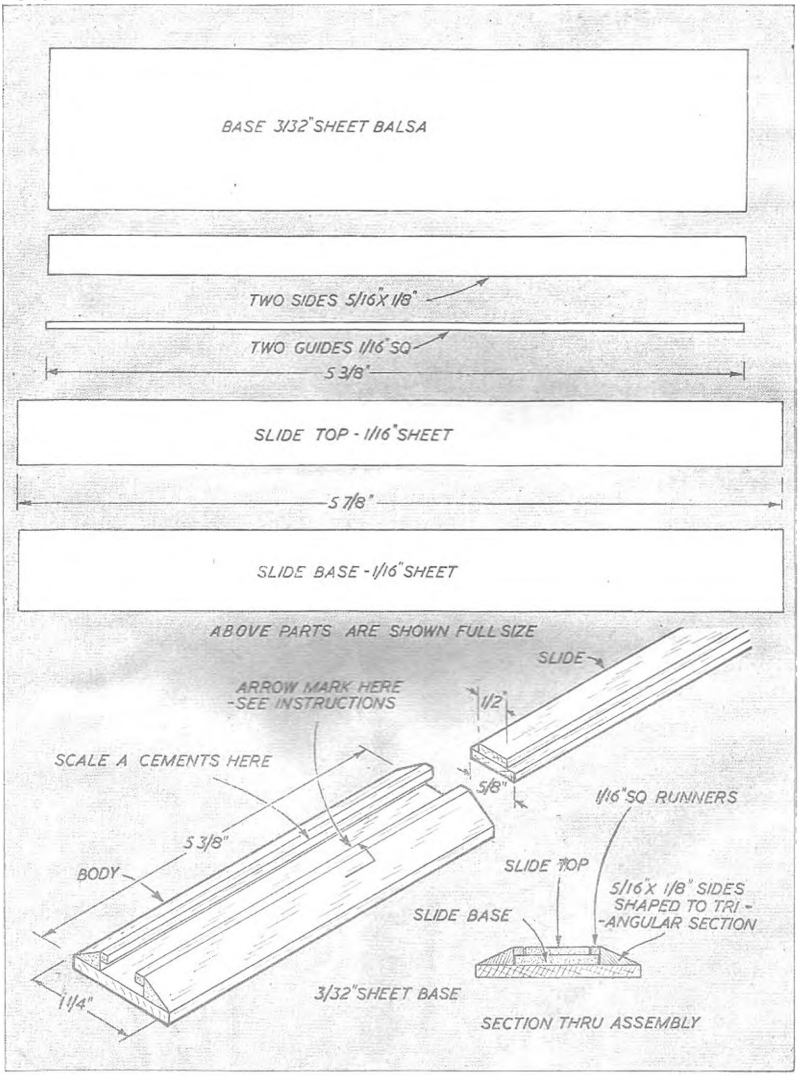
Similarly, to get best results, take care over the assembly of the different parts of the rule itself. The slide must be a nice sliding fit in the body, but at the same time not so tight that it binds, and it is difficult to move the slide at all. Any side play, allowing the slide to move laterally with respect to the body will also introduce inaccuracies.

It as is well, too, to protect the paper scales in some way. After some use—and carrying the rule around in the pocket—they will tend to become dirty, or even torn and damaged. The whole rule can be given several coats of clear dope—with slide dissembled from the body—or thin paper varnish. An alternative, and equally effective method, is to face the scales with cellulose tape, although this suffers from the disadvantage that once the tape is worn it cannot be torn off and replaced without the risk of damaging the paper scales underneath.

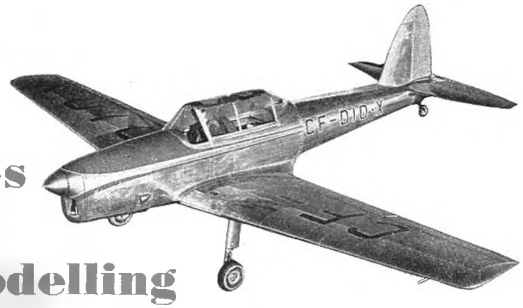


SLIDE SCALE

SCALE A


BASE 3/32" SHEET BALSA
TWO SIDES 5/16" X 1/8"
TWO GUIDES 1/16" SQ
5 3/8"
SLIDE TOP - 1/16" SHEET
5 7/8"
SLIDE BASE - 1/16" SHEET
ABOVE PARTS ARE SHOWN FULL SIZE
SLIDE
ARROW MARK HERE -SEE INSTRUCTIONS
1/2"
SCALE A CEMENTS HERE
5/8"
1/16" SQ RUNNERS
5 3/8"
BODY
SLIDE TOP
5/16" X 1/8" SIDES SHAPED TO TRI-ANGULAR SECTION
SLIDE BASE
1 1/4"
3/32" SHEET BASE
SECTION THRU ASSEMBLY

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



Prototypes Worth Modelling

By C. B. Maycock

THE DE HAVILLAND DHC-1 CHIPMUNK

THE choice of the De Havilland "Chipmunk" as a subject for a free-flight or control-line model is an almost ideal one. It has clean cut lines and little in the way of complicated detail. An aluminium cowling and sheet balsa fuselage, together with a fully sheeted leading edge, will faithfully reproduce the metal sheeting of the original. The fixed undercarriage lends itself to robust construction in the model and the canopy can be made really strong to take care of an accidental turn over—as indeed it does in the full-sized machine.

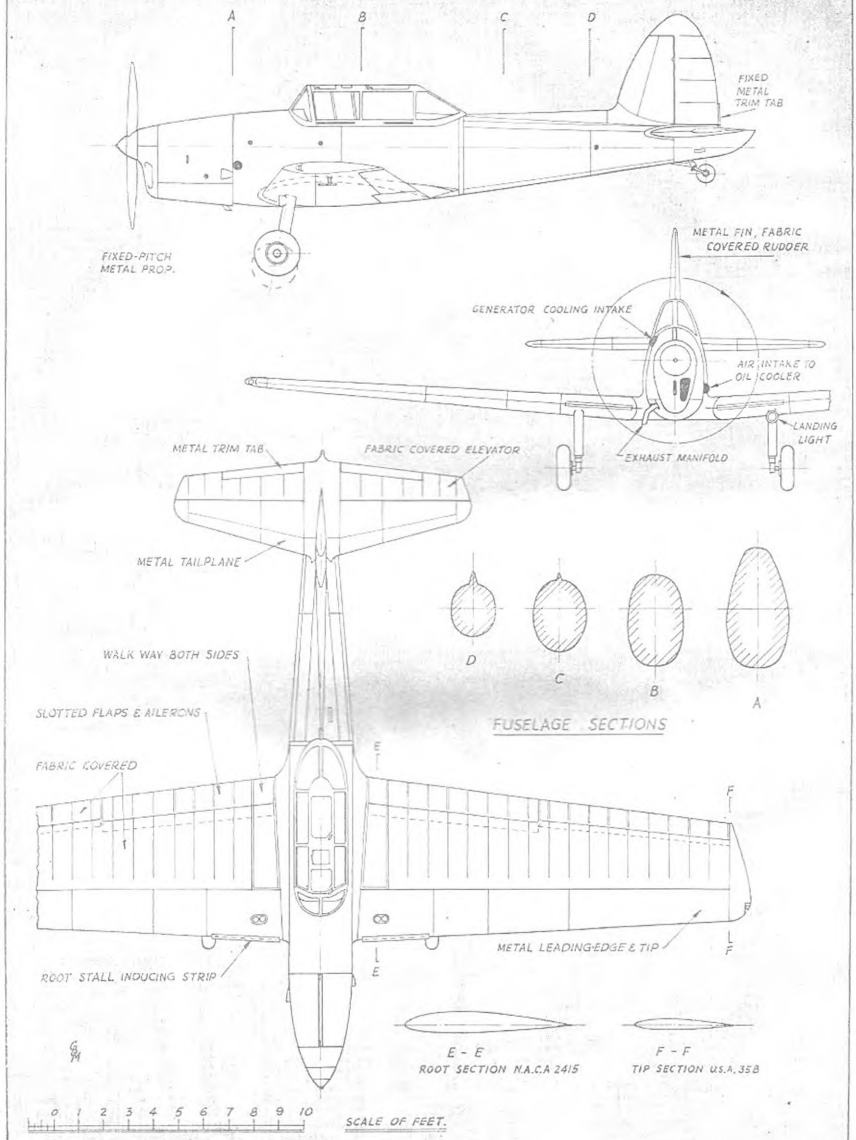
"Chipmunks" are now being delivered as replacements of the De Havilland "Tiger Moth" to R.A.F.V.R. units and have the standard broad target yellow Training Command bands around the fuselage ahead of the fin and, across the upper surfaces only, chordwise as far as the slotted flap shroud. On the under-surfaces they have the Air Ministry registration letters and numerals on each wing in large characters. Finish is natural metal and the fabric covering aft of the leading edge of the wing, ailerons, rudder and elevator are silver-doped. The anti-glare panel on the nose is the usual matt black. The after side panels of the pupil's (front) cockpit are amber tinted for night flying conditions.

The "Chipmunk" is powered by a De Havilland Gipsy Major 10 and drives a two-blade fixed pitch airscrew of 78.84 in. (2 metres). The main dimensions are as follows:—Span, 34 ft. 4 in.: length, 25 ft. 5 in.; height, 7 ft.; dihedral, 5 deg.; ground angle, 12 deg. approx.: wheel track, 8 ft. 11 in.

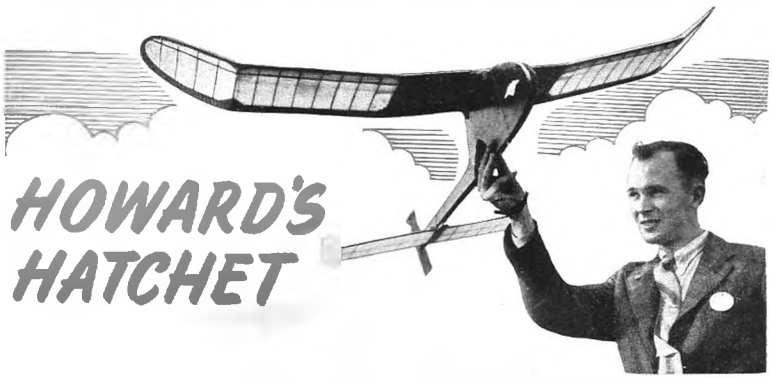
For those who like to super detail their models the disposition of the various instruments might be useful. Brake lever, engine controls, elevator trim wheel ground switch, fire extinguisher, and fuse panel are all on the port side of the front cockpit. On the starboard side are flaps lever, map case, and intercom. plug-in. Between the pilot's legs, raised up is the compass, "on-off" lever and V.H.F. radio. A standard blind-flying panel is placed centrally on the dash, on the left of which is the starter button, rev. counter and magneto switches; on the right, oil temperature and pressure gauges. The layout of the rear cockpit is substantially the same.

The engine cowling hinges about the centre line on the top and each half can be strutted open for maintenance. On the R.A.F. version the landing light is faired into the top of the port undercarriage fairing and the wing tip navigation lights are separate items set into the wing tips and not enclosed in a transparent moulding. Like all good designs, from whatever angle the "Chipmunk" is viewed, it is very satisfying to the eye.

In order to cater for all tastes, it is intended to deal in this feature with old and new types of aircraft alternately. By way of contrast, the next subject on this series will be the Anoinette IV, an interesting type of 1910-11 vintage which should appeal to lovers of the old-timers.



DE HAVILLAND DHC-1 CHIPMUNK



HOWARD'S HATCHET

THE "Howard Hatchet" is an ideal contest type glider, and although not a large job it stays in sight for at least 5 min. in quite high winds, owing to the tight circle obtained by the use of an auto-rudder. This also enables a dead straight tow-up to be made, and maximum height to be attained before release. A dethermaliser is essential for this model and the one described is very effective and reliable. Hard balsa must be used throughout unless otherwise specified.

Tailplane—It is advisable to start with the tailplane, so that when building the fuselage the correct amount of balance weight can be built into the nose. Cover the tailplane before cementing the end fins in place and give it one coat of dope.

Fuselage—Commence by building the triangular boom from $\frac{1}{16}$-in. sheet. Cut the keel from two sheets of 3-in. × 3 32-in. sheet butted together. Bind the 16-gauge wire tow hooks to the lower of the two sheets before cementing them together. Cut a slot $4\frac{1}{8}$ in. long in the keel so that it can be slid into the boom. Now cement the $\frac{1}{4}$-in. sheet outline and $\frac{1}{2}$ in. × $\frac{1}{4}$ in. half formers in place on each side of the keel. The "A" shaped part, which is cut from 16-gauge aluminium, can now be bolted into place. Smear cement around the nuts to lock them in place. The slots in the underside of the fuselage must be long enough to give about $\frac{3}{4}$ in. of movement. The fin is built up on the fuselage. Cover the fin and rudder before pinning the rudder in position. Install the wire and thread parts of the auto-rudder and check its movement. Attach the completed tailplane in place and add weight to the nose until the model balances at about 50 per cent. chord. The fuselage is then ready for the nose to be covered with 1/32 sheet. Rub the fuselage down with glasspaper and dope on tissue. Give the fin and rudder one coat of dope and the fuselage three.

Wing—This is quite orthodox and is in one piece. The laminated L.E. at the tips is made by a method which is probably not widely known. First make a former of deal or thick balsa to the inside shape. The next operation requires very speedy work, so get the former, pins, cement, and the 8 strips, 18 in. × $\frac{5}{8}$ in. × 1/32 in. handy. Quickly cement all the strips together in a pile, firmly pin one end of the pile in place on the former and push the strips round before the cement has had time to set. Then pin the other end in place. When set carefully cut down the middle to make the two tips $\frac{5}{16}$ in. × $\frac{1}{4}$ in. Cover the wing with Jap tissue and give two coats of clear or coloured dope.

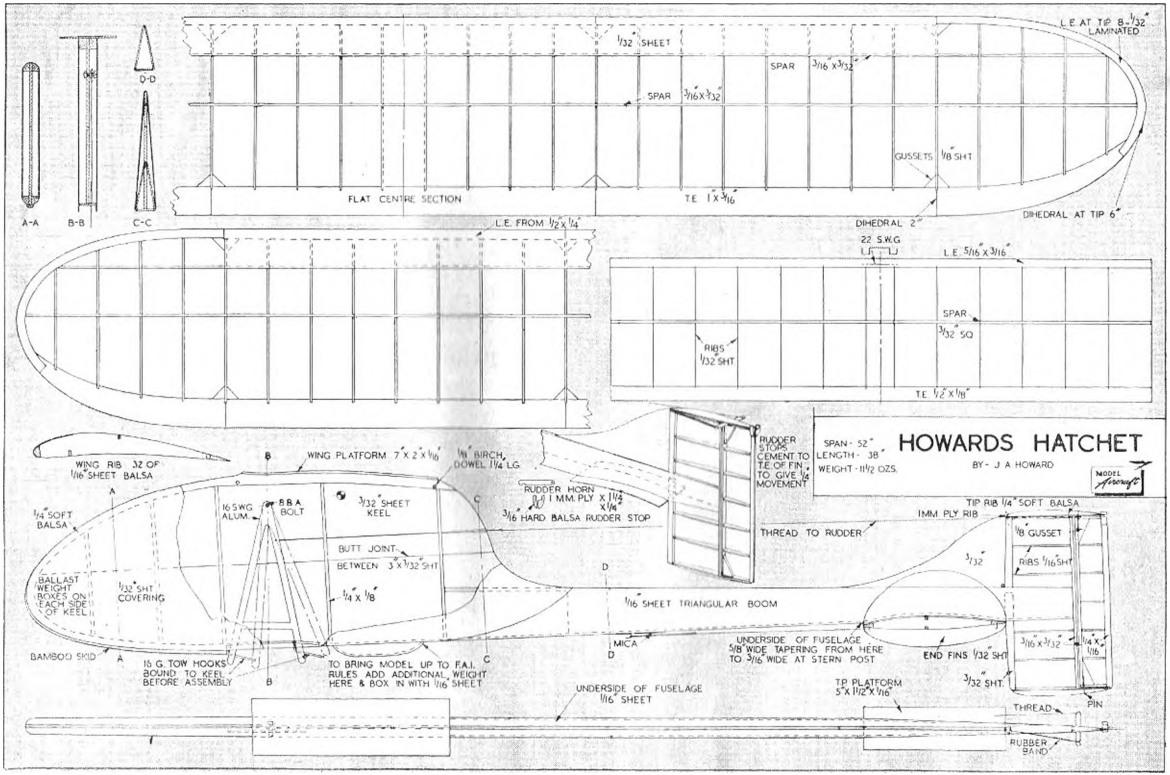
Dethermaliser—The tailplane is held in place at the trailing edge by two rubber bands, and at the leading edge by a loop of thread about 6 in. long, which goes over the boom, and through the wire loops on the tailplane. It is kept in tension by a rubber band attached to the bent pin on the underside of the fuselage. The fuse is put through the band which as it burns allows the leading edge of the tailplane to drop between 50 deg.-70 deg. from the horizontal. What happens after that is always interesting. Sometimes the model mushes down at a fairly fast rate, or it may spin, loop or bunt. What ever antics it performs, however, it *does* come down and is well able to survive the landing. I use upholsterers, piping cord, which burns at about 0.4 in. per min. for the fuse and I do not treat the cord with saltpetre.

If it is desired to fly the model in F.A.I. competitions add the additional weight required to the underside of the fuselage and box it in as shown on the plan with $\frac{1}{16}$ in. sheet to bring the fuselage cross-section area up to the correct size.

Weights :

Wings	$3\frac{1}{2}$ oz.
Tailplane	$\frac{1}{2}$,,
Fuselage (including 2 oz. ballast) ...	$7\frac{1}{2}$,,
Total	$11\frac{1}{2}$ oz.

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


HOWARDS HATCHET
SPAN - 52"
LENGTH - 38"
WEIGHT - 11½ OZS.
BY - J. A. HOWARD
MODEL Aircraft
A-A
B-B
C-C
D-D
L.E. AT TIP 8 - 1/32" LAMINATED
1/32" SHEET
SPAR 3/16" X 3/32"
SPAR 3/16" X 3/32"
GUSSETS 1/8" SHT
FLAT CENTRE SECTION
T.E. 1" X 5/16"
DIHEDRAL 2"
DIHEDRAL AT TIP 6"
L.E. FROM 1/2" X 1/4"
22 S.W.G.
L.E. 5/16" X 3/16"
SPAR 3/32" SQ
RIBS 1/32" SHT
T.E. 1/2" X 1/8"
WING RIB 32 OF 1/16" SHEET BALSA
WING PLATFORM 7" X 2" X 1/16"
1/8" BIRCH DOWEL 1 1/4" LG.
RUDDER STOPS CEMENT TO T.E. OF FIN TO GIVE 1/2" MOVEMENT
RUDDER HORN 1 MM. PLY X 1 1/2" X 1/4"
3/16" HARD BALSA RUDDER STOP
1/4" SOFT BALSA
16 S.W.G. ALUM.
B.B.A. BOLT
3/32" SHEET KEEL
BUTT JOINT BETWEEN 3" X 1/32" SHT
1/4" X 1/8"
BALLAST WEIGHT BOXES ON EACH SIDE OF KEEL
1/32" SHT COVERING
1/16" SHEET TRIANGULAR BOOM
MICA
BAMBOO SKID
16 G. TOW HOOKS BOUND TO KEEL BEFORE ASSEMBLY
TO BRING MODEL UP TO F.A.I. RULES ADD ADDITIONAL WEIGHT HERE & BOX IN WITH 1/16 SHEET
UNDERSIDE OF FUSELAGE 1/16" SHEET
UNDERSIDE OF FUSELAGE 5/8" WIDE TAPERING FROM HERE TO 3/16" WIDE AT STERN POST
TP PLATFORM 5" X 1 1/2" X 1/16"
THREAD TO RUDDER
1MM PLY RIB
TIP RIB 1/4" SOFT BALSA
1/8" GUSSET
RIBS 1/16" SHT
3/32"
END FINS 1/32" SHT
3/16" X 3/32"
1/4" X 1/16"
3/32" SHT.
THREAD
PIN
RUBBER BAND

● JIM GREENING—President of the St. Albans Club—also comments on our team racing notes in the May issue. In the first place it seems we incorrectly gave the date of the All Herts Rally as August 20th. It should of course by July 23rd, and we apologise for the error. Here's Jim's letter :—

" We originally cooked up a set of rules for our own team racing event, but when we saw that the Brighton (S.E. Area) rules were different from ours—and that those in the S.M.A.E. Handbook were different *to both*—we decided that in fairness to the modeller, we would make our rules essentially the same as those laid down by the S.M.A.E.

" We feel that the idea of a special class for the smaller power plants using 35 ft. lines is a good one. However, much as we would like to introduce such a class, we are unable to do so, for the simple reason—that we just can't afford it ! As you know, we do not ask the trade for prizes, as we consider it unfair to ask them to advertise in a rally programme *and* supply prizes. This means that we have to raise all prize money ourselves and the rally this year is going to cost us about £125, of which we are guaranteed about £40 from advertising. The total prize money this time is £45—this being raised (except £13 profit from the last rally) by subscription amongst our own club members. However, we shall bring in an event for small team racers next year, if at all possible."

Ken Brookes—jet propelled p.r.o. of the St. Albans Club—sent us further details of the 1950 Rally. This will be the fifth such meeting to be held at Radlett (Handley Page aerodrome in Hertfordshire. This year the contests will be run in two main sections. First will be rubber, glider and free-flight, running simultaneously in the morning and early afternoon. Then the " Concours "—followed by the C/L events. Team racing (*Radlett Races*) has been added to the usual speed and stunt events this year. Admission is by programme only, from J. Greening, 14a Holywell Hill, St. Albans, Herts. (7½d. post free).

● Our remarks on team racing in the May " Power Talk," prompted D. C. Butler of the Surbiton club to send in his opinions on the subject. He writes :—

" I think that the present S.M.A.E. team racing class should be kept as it stands and a new one for smaller models instituted to the following specifications : Maximum motor capacity of 1.5 c.c., minimum wing area of 75 sq. in., maximum tank capacity of ½ a fluid oz. and a line length of 35 ft.

" The top engine limit of 1.5 c.c. is suggested for the smaller classes as I think it is essential that the capacity decided upon should coincide with one of the existing speed classes to avoid hampering engine manufacturers by the choice of an odd c.c. rating. I should prefer to see the fully cowled rule retained and a dummy pilot made compulsory—otherwise it makes things too easy. Should hate to see team racers degenerate into sawn-off stunt jobs."

More readers comments on team racing are invited. One thing seems certain—most modellers are in favour of a smaller class, so that such motors as the Elfin 1.49, Javelin 1.49 and E.D. Bee may be used.

★ ★ ★

● INTEREST IN Wakefields grows yearly and the time seems appropriate for news of some of the 1950 crop of models. We doubt if a nicer looking Wakefield will be flown this season, than Ed. Stoffel's new version of the *Aristocrat*, a photograph of which appeared in " Photonews " (May issue). This model differs from the original in the following details : Lighter fuselage construction, smaller cabin. geodetic tailplane, etc.

Bob Copland placed top in the 1st Wakefield Eliminator in the London Area this year. He told us that he is using Pirelli rubber this year. The model was the usual Copland streamliner multi-stringer type, but the wing appeared farther back than on last year's design. The propeller was the two-bladed folding type and Bob still sticks to the parachute type D/T.

Ray Collins's new Wakefield is interesting. His model features a cabin type fuselage with plug-in wings. Other details are : Folding one-blader propeller, retractable U/C (single leg), twin fins and polyhedral wings.

★ ★ ★

● TAKE A tip from us—when that new model has been covered, water tightened, and is all ready for doping—*Go Carefully*. Especially if you propose using an unfamiliar brand of dope for the first time. We tried a jar of transparent coloured shrinking dope recently and made a fine mess of a new glider wing. Even after several coats, the effect was little better than would have been obtained with weak water colours. Result : several hours of wasted effort in stripping and recovering before we were able to get back to where we started. In this case, the covering was rag tissue and perhaps the results

would have been better with a less absorbent paper. But the lesson is quite clear—*Always* cover and dope a section of an old wing or fuselage to see just how new dopes take to the tissue you intend to use. Even if it goes on O.K. you may not like the look of the colour after all. Reminds us of the time when we bought a tin of dope, which turned out to be incorrectly labelled—and was in actual fact Banana Oil. You can imagine that the covering (silk too !) was pretty slack.

★ ★ ★

● GEORGE TEMPLE sends in some news of his latest glider activities. Here's his letter :—

" For the past two years I have been mainly concentrating on chuck gliders and the latest ones are pretty good. Getting 80-90 sec. in still air. I'm also developing several Jetex designs—incorporating thrust augmenters, and all sorts of gadgets. To date, I can get 4½ to 5 min. in calm conditions—on a 20 sec. charge. Main trouble, I find, lies in getting a safe and rapid r.o.g. take-off. Hand launch is dead easy of course and the climb of these jobs is straight up, with no stall at the top. I find that Jetex gives me a better performance than either petrol or diesel motors—and I dislike the noise and messy fuel of the latter anyhow.

" Am also playing about with A-2 models, but these are rather different from my usual designs—being built up mainly from brown paper and plastics. These gliders feature a sort of keel (forward of the c.g.) which can be adjusted for side area. Aspect ratios are lower than the average Scandinavian model."

Incidentally, George paints pictures for a living. When we first heard that he was an artist, we had visions of sailplanes gracefully poised against towering banks of cumulus. But no, it appears that paintings of boats are a much better commercial proposition—especially Thames barges !

★ ★ ★

● WHICH IS the worst—losing a model or smashing it up ? Personally, we prefer the latter every time, as you can always salvage *something* ! The man who thinks of a really good scheme for locating lost models certainly deserves an aeromodelling Oscar. We brush aside such impractical suggestions as mixing stink bombs in with the fuel proofer or letting carrier pigeons go along for the ride.

No, what we want is something practical. Such as a built-in whistle—that would operate at normal flying speeds—and at least ensure that anyone in the vicinity of the model hears all about it when it lands. Another pet idea of ours is to install an automatically inflatable balloon (on a string) that pops out of a trapdoor the moment the model touches down. Should be just the job for models that have a homing instinct for long grass or corn. Best idea of the lot and this one has actually been used by Dick Everett in America—is a radio controlled dethermaliser.

● IT'S A good idea to get into the habit of keeping a design record of each new model you build—not forgetting to list any alterations that become necessary as a result of flight testing. Finding the c.g. position of an existing model is quite straightforward if you use Gordon Light's method. Just tie a piece of stout thread to the chandelier (or similar !), then attach a pin to the free end. Push the pin into the trailing edge of the wing (at the centre-line) and allow the model to hang freely. Mark a vertical line on the fuselage side—lining up with the thread. Repeat the process with the pin pushed into the leading edge of the wing. Where the two lines on the fuselage intersect is the c.g. position.

Finding the centre of lateral area requires a little more work. Draw an accurate reduced scale side view of the model under consideration, stick it on to a piece of cardboard and cut round the outline with a razor blade. Guess the approximate c.l.a. and push a pin through the profile, allowing the latter to pivot freely. Try other pivot points until the profile balances stationary in any attitude. Credit goes to Frank Zaic for this neat method.

If a model is a good performer, information so recorded is useful when planning a new design. If, on the other hand, the model was a disappointment, maybe the trouble can be traced from the plans and design record.

In Brief

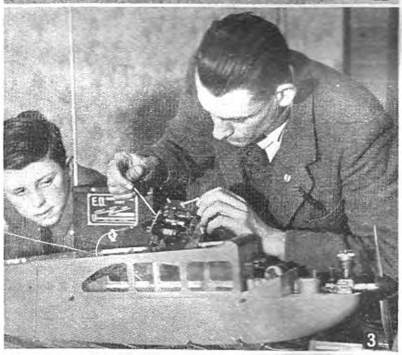
One of the best Jetex scale designs we have seen, is J. H. Maxwell's " 50 " powered Fouga Cyclone. Plans appeared in a recent *Model Airplane News* . . . How about writing in to *Power Talk*, with news of your own or your club's activities. If the information is of general interest to readers, we shall be pleased to include it in a future issue.

M. Jobling, Press Secretary of the Blackheath M.F.C. with his Frog " 100 " power assisted glider.

MODEL Aircraft photonews


1


2


3


4

THE Imperial Palace in Tokyo was on April 24th this year the scene of a display by Japanese modellers at which over 1,000 planes were on show. Still denied participation in full-sized flying, the Japs are taking a very keen interest in model aircraft.

Photonews star model this month is shown in No. 2. This fine model of a Chrislea Super Ace is the work of well-known R/C flyer, F. H. Ashdown, of the Southend Senior Club. Main features are :— Engine : O.K. Twin ; R/C equipment : E.C.C. ; Weight : 18 lb. : Fuselage in three sections for easy transport. The R/C gear is in a self-contained detachable unit, the movement of which enables the c.g. position to be adjusted. Red and green tail lights indicate right or left rudder.

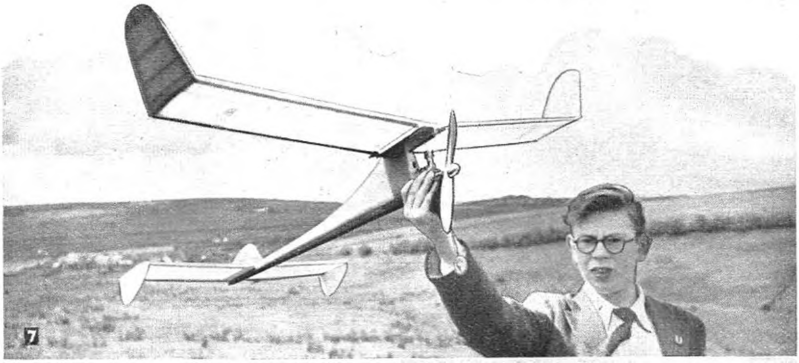
No. 3 is a *Yorkshire Evening Post* photograph and shows the York Club P.R.O., T. Heslewood, and his young friend, Roy Hodgson, with their E.D. "Radio Queen."

Reader John Garwood, of the Carshalton M.A.C., not only makes fine models, but he also knows how to photograph them. No. 4 shows his 1/12th scale Albatross DX1 control-liner which has had a good deal of flying. The weight is 15 oz. and the power unit a Mills Mk. I. We could do with more readers' photographs as good as this one.

A spot of finger trouble seems to be bothering L. F. W. Howe, of Berkhamsted (No. 5). During the South Midland Area Halfax Trophy contest he managed to get his finger mixed up with the propeller, like most of us do at some time or other, with the usual disastrous results.

One seldom sees really good solid scale models these days, but P. L. Gray, of Luton, is a very keen solids fan and he recently sent to us a number of


5



photographs of his fine collection. Photo No. 6 shows one of these, an LVG C5.

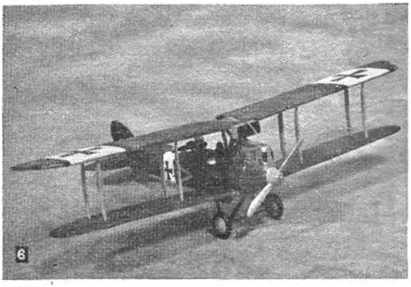
N. Osborn, of Belfast, sent us photograph No. 7 of Jack Kennett with his E.D. Competition Special powered duration job. Jack is an English exile who is at present employed in a Belfast aircraft factory.

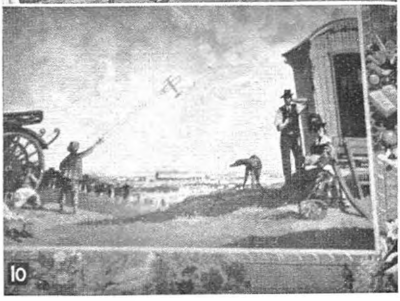
The next photograph came from Canterbury Pilgrims' club member, E. Rigden, and shows his Elfin 2.49 powered American "Pacemaker" model, which on its first outing gained third place in the Precision Power Event at the 1950 Ashford Rally.

At Fairlop recently we spotted the fine D.H.9a shown in No. 9 with its owner, F. Saunders, of the Battersea & District M.A.C. It is to be fitted later with R/C equipment and weighs 6 lb. The engine is an E.D. Mk. IV.

We end this month's Photonews with a problem picture. It was also taken at Fairlop—not the aerodrome this time, but the railway station! On the wall was a large advertisement for Whitbread's beer and the C/L model had been drawn on so skilfully that we could hardly believe our eyes—you can take our word for it that the photograph has not been retouched. Although this sort of thing should not be encouraged, we must admit that we had to smile.

That's all for this month—and keep on sending those snaps in.





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*

HIGHER FEES FOR "EXPERT" CLUBS ?

DEAR SIR,—Your correspondent D. Finch, whose letter appeared in the May issue of MODEL AIRCRAFT, certainly hit the nail on the head with regard to the present state of our hobby.

I am in complete agreement with his references to the "expert" clubs. In the London Area recently a number of old established clubs have been split up, and "contest fliers only" clubs(?) have been formed by some of the late members. The point that I should like to emphasise, is that most of these are *not genuine clubs at all*, but merely small groups who take on some title or the other in order to be able to enter S.M.A.E. contests at a reduced fee. They have no intention of helping the novice or newcomer to the hobby—they are interested in one thing only—pothunting. I agree with D. Finch that the S.M.A.E. should make them pay a higher affiliation fee than the clubs which have been, and still are, doing a good job of work and helping the movement to grow.

Throughout the country the lone hands greatly outnumber the club members, as any model shop owner could confirm, and this is not surprising considering the lack of encouragement they receive at present.

Yours truly,
"A. Cockney."

WANTED—CONTEST FLIERS ONLY

DEAR SIR,—Only too well do I know how Mr. D. Finch of London feels and my views coincide with those which he expressed in the May issue of MODEL AIRCRAFT.

I was a member of the now broken-up North Birmingham M.A.C., which because of a craze for motor cycles, became a club of very few members.

Over the past year I have been a "Freelance Aeromod," and, having found out that the majority of clubs have the attitude, that "If you are not a comp. specialist you are no good to us," I decided to stay as I am. Recently, however, a number of young people who watch my models flying in the local park ask about them, and would, I think, like to band together and form a club. Even now I wait for the first one to display a newly built model, and once again see on the wings "North B'ham M.A.C."!

Yours faithfully,
Erdington, Birmingham. J. ROGERS.

MECHANICAL STARTERS

DEAR SIR,—I note the remarks of a "well-known contest flier," in your June issue regarding the use of mechanical starters, and as a typical (I hope) speed C/L flier I venture to suggest that these remarks tend to create a false impression to the uninitiated of anyone using a starter. Therefore, may I, as a "not well-known contest flier," be allowed to make the following observations.

This gentleman contended 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." I myself always use a starter for my speed models, not because I cannot start a motor by hand (as a matter of fact I have had as much experience of starting motors as anybody, and shall always be willing to demonstrate a "hand start" for our friend), and I can assure him my engines do not need "coaxing into life." I use a starter because it is obviously the best way to start a speed engine.

"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."? Yes, by all means let a contest be a test of skill and ability, but is it not rather unfair to assume that just because a contestant has the enthusiasm and initiative to make a starter, that it is to eliminate a "shortcoming." If we are to obtain special results by all means let us have special equipment, but please let us not assume that the person who owns a starter is rolling in money and has not got a clue on starting a motor by hand!

Just one more point—you don't have to be a millionaire to own a starter—it is quite a simple matter to convert an old grindstone into a really good starter, and on the electric type the battery is the only expensive item. The car starter-motor which I use was obtained from a breaker's yard for a few shillings, and the box in which it is mounted is an old packing case.

I couldn't afford a starter—but I've got one! A friend and I have half shares in the battery, so you see "where there's a will there's a way."

Yours faithfully,
Wimbledon. N. G. TAYLOR,
(*Secretary* Wimbledon Power Club).

TAILLESS MODELS HAVE A FUTURE

DEAR SIR,—I was most interested to read the description of Bill Dean's "Skystreak" in the MODEL AIRCRAFT feature "Over the Counter," on page 167 of your June issue as I have also carried out extensive development work on tailless C/L models. A G.A. drawing of one of my designs—to which the "Skystreak" bears a striking resemblance—was published in a contemporary journal during last year and this, also, was aerobatic though very stable. A complete cure to the excess stability problem on this type of model was found after a little adjustment to the c.g. and control plate positions and the resultant flight characteristics were quite up to contest standard though flying speed was a little high (60 plus m.p.h. on a Frog "160").

I mention these points as I firmly believe that tailless models have quite a future—for both C/L and free-flight—and are worthy of considerably more attention than they receive at present.

Yours sincerely,
London, S.W.19. J. R. VANDERBEEK.

Aeromodelling in Norway

by

R. W. Smyth

SINCE the war, aeromodelling in Norway has made great progress and there are some thirty clubs affiliated to the governing body, the Norsk Aero Klubb, which has given the model aircraft movement great encouragement. The clubs are represented by Thor Molbach, who was a member of last year's Norwegian Wakefield Cup team and who has been a keen aeromodeller since 1929.

All models owned by affiliated club members are registered with the Norsk Aero Klubb and are allocated registration numbers. For example, with Registration No. A4-97, A indicates the town, 4 the district or club, and 97 the personal number.

The largest club in Norway is the Oslo Modellflyklubb which boasts a membership of 300 junior and 50 senior members. During the war the club was dissolved by the Nazis, but it went underground and continued to hold flying meetings under the very noses of the enemy.

It was during this period that a keen interest was taken in diesel engines, of which many fine examples of .25 to 4.5 c.c. were produced by Ovind Andersen, an engineer and member of the Oslo Club. His latest engines incorporate many novel design features, including one with a variable position rotary valve and another with three by-pass ports, one of which is situated under the exhaust port, and a fuel inlet on the crankcase backplate with a fluttering steel plate valve as used on the Dynajet engine.

A typical Norwegian contest scene. This photograph was taken during a meeting at Maridalsvannet, near Oslo.

On the right in this photograph is Per Hof, a leading Norwegian designer. He is holding the "Esa" glider which is mentioned below.

In 1948 an effort was made to introduce the building of model aircraft into the curriculum of schools in Oslo as a handicraft subject. The experiment was carried out in six schools and the classes consisted of about 20 pupils between the ages of 11-14 years; the terms comprised ten lessons of two hours duration each.

During the first term the instruction was given by senior members of the Oslo Club, but in the spring of 1949 the Chairman of the Club, Mr. H. Orvin, instructed the school handicraft teachers in the art of aeromodelling and the subject has now been permanently included in the school syllabus.

The model chosen for instructional purposes was a Finnish beginner's glider of 25 in. span, known as *Esa*. At the end of the term a competition was held and model kits were presented as prizes to the winning pupils. In March, 1950, another contest for *Esa* type models was held at Maridalsvannet, a frozen lake on the outskirts of Oslo, and over 400 elementary school pupils competed.

Owing to the lack of suitable open spaces, the best time for model flying in Norway is between October and April, when the temperature is more often than not well below freezing point and the lakes are frozen over with from 6 in. to 4 ft. thickness of ice. These lakes, and very often some of the fjords also, provide ideal flying spaces, with unobstructed vision for miles, which is, of course, ideal for timekeeping. The meetings must, however, be well organised as the weight of 200 or more people standing close together can cause the ice

Pod-and-boom type of gliders predominate at Norwegian flying meetings, but a Wakefield model can be seen in this photograph.

to crack with a loud "crump," warning everyone to scatter or to prepare for a cold bath!

The present main trend of interest is in gliders, the A-2 Nordic class being very popular due to the inter-Scandinavian contests which are held for this class. The use of steel wire tow-lines, in conjunction with fast winches for winding-in, is quite common and a parachute is usually fitted at the model end of the line. Sigard Issacson wing sections with sharp leading edges, and the pod-and-boom type of glider layout predominate.

The glider is closely followed in popularity by the diesel engined pylon duration type of model and now that supplies of high quality rubber and balsa wood are again available the Wakefield class has attracted much interest, as was shown by the entry of a Norwegian team in the 1949 contest at Cranfield.

In Norway, therefore, the summer is the time for building and the winter for flying, when it is a case of:—

Off the frozen lakes we fly,
Without a thermal in the sky.

Build a MINICOUPE

A Neat Miniature Cabin Model

By Vic Dubery

THIS little model should be a pleasant diversion from competition jobs and well worth the few hours work and scraps required to build it. It makes realistic flights outdoors in a restricted space or indoors free-flight and r.t.p., and is very robust for its weight.

Though simple enough for a beginner the plan should be studied carefully before commencing building as it has been somewhat cramped to enable it to be presented full size. You will need to trace to obtain the right-hand wing and left-hand tailplane.

The fuselage is straightforward but the use of the temporary spacer to retain the nose shape until former *A* is cemented firmly in place should be noted. Cover the underside of the wing saddle with stiff paper and add the cellophane and other stiff paper parts as indicated. Cover the remainder with tissue, leaving a hole for access to the rear of the rubber and water shrink only.

Be careful when bending the tailplane and fin outline to keep the curve all in one plane. Single covering should be used and not shrunk.

Build both wing spars in one piece, then lay one side flat on the plan and add ribs 2-5 and the wing tip When dry, weight the other side and add the corresponding parts. Ribs No. 1 should be added after the wing has been removed from the plan as these have convex undersides. Cover the wing with tissue and water shrink but be careful to avoid warps.

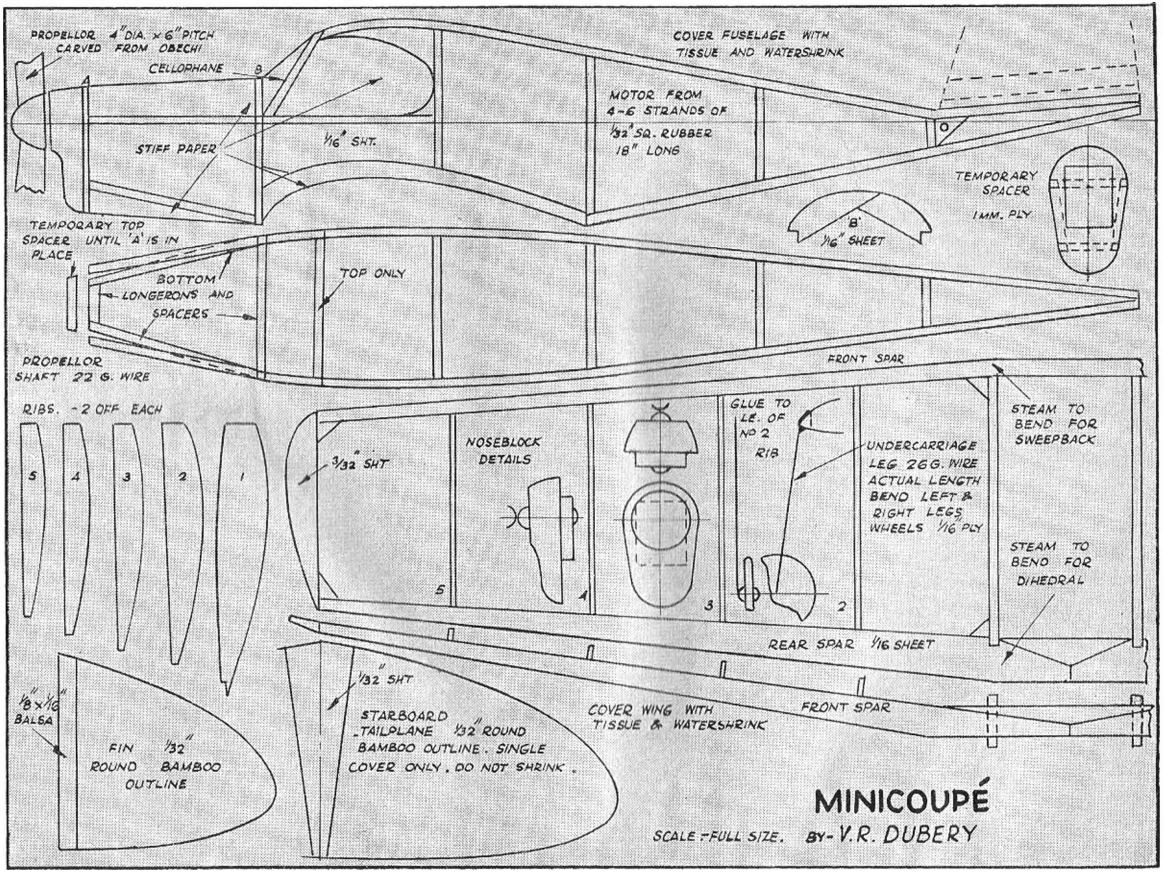
The undercarriage legs are glued firmly into each leading edge at No. 2 rib. If you wish your model to have the appearance of a retracted undercarriage in flight try using sheet celluloid for wheels and the thinnest wire that will support the model.

The noseblock should be made a good fit into former *A* as there is a slight downward pull on the rubber which might give unwanted upthrust. A neater bearing can be made by using aluminium sheet instead of the cup washers shown.

The propeller-shaft should be of 22-gauge wire. A carefully carved obechi propeller of normal proportions is more efficient than a bought balsa one and may obviate the necessity of adding ballast to the nose. A Frog Mk. V interceptor propeller is also suitable.

Complete the model by cementing the tailplane and fin in place, attaching the wing with a rubber band and installing a 12 in. loop of $\frac{1}{8}$ in. × 1/30 in rubber. The model should balance at $\frac{3}{8}$ in. back from the leading edge at the centre section. For r.t.p. use 4-6 strands of 1/32 in. square rubber, 18 in. long should be used.

Test over soft grass in the usual way, making side and downthrust adjustment with small packing pieces behind the noseblock. The original model was made to spiral steeply to the right on take off and glide straight. When adjustments are satisfactory a neat job can be made of the noseblock and the final finishing details added to taste. Civilian registration letters make no end of difference to the model's appearance.



MINICOUPÉ

SCALE = FULL SIZE. BY - V.R. DUBERY

FLYING SCALE MODELS

● In this second instalment of his article the author deals with the most practical method of preparing working drawings from a 1/72nd scale plan.

By A. W. Garry

BEFORE proceeding further, will we endeavour to dispel any remaining doubts which the prospective scale model builder may entertain.

I would like to emphasise that this article has been kept strictly practical and all "theory" rigidly avoided. There is no need whatever for the modeller to be versed in the theory of aerodynamics, or for him to be under the impression that mathematical formulae, abstruse scientific calculations, "graphs," etc., are essential to the design and construction of a successful flying scale model. They are most certainly not. Neither does one have to be a skilled draughtsman to produce efficient working drawings. Admittedly, such a proficiency would be an asset, but it is not essential. There is a very simple and accurate method of "scaling-up" the 1/72 scale drawings which are given in the aeromodelling magazines from which the would-be scalemodeller will probably select his prototype.

It is assumed, of course, that the reader has served his "apprenticeship" in the model aircraft hobby, and is familiar with the practical methods of building, trimming and flying models of the conventional duration type—both power and rubber driven. It is also assumed that he has practical knowledge of the methods employed to obtain inherent stability—i.e., dihedral angles, mainplane and tailplane incidences, side and down thrust, etc., and is capable of trimming a power plane for stable flight and glide. If such is not the case, it would be extremely unwise for him to embark upon the construction of a flying scale model, and he would be well advised to obtain proficiency in the building and flying of normal duration type aircraft first.

Practical Designing

Let us proceed upon the assumption that you are designing a model from a 1/72 scale drawing. You will have the scale drawing of the prototype which you have chosen, together with whatever photographs and "gen" are available. We will assume that it is a biplane (monoplanes can be scaled-up by the same method) and that you are going to build it to a scale of $\frac{1}{8}$th. A simple calculation will show you that the scale drawing must be enlarged nine times on your working drawings. There is no need for calculations, or tedious measuring with a rule.

We shall need the following articles for the production of our working drawings :—

1. A good drawing board (or the kitchen table may be used if it is smooth and level).
2. A 2 ft. straightedge (a smooth length of wood will do, providing its edge has been planed dead straight and smooth).
3. A celluloid set square, a good drawing pencil, rubber, and the all-essential compasses.

Good drawing or cartridge paper can be obtained from any good stationer, in sizes about 24 in. × 30 in. You will probably need three sheets.

The sole measuring and enlarging agent is a good pair of compasses, which must be strong, rigid and incapable of accidentally altering their radius. We simply take dimensions from our scale drawing with the compasses, and the transfer this dimension to our working drawing *nine times*, so that, say, a wing chord which is $\frac{3}{4}$ in. on the scale drawing, is automatically enlarged to the correct $\frac{1}{8}$th size of $6\frac{3}{4}$ in. Example *A*, Fig. 3 should make this clear.

Now before we commence our working drawing,

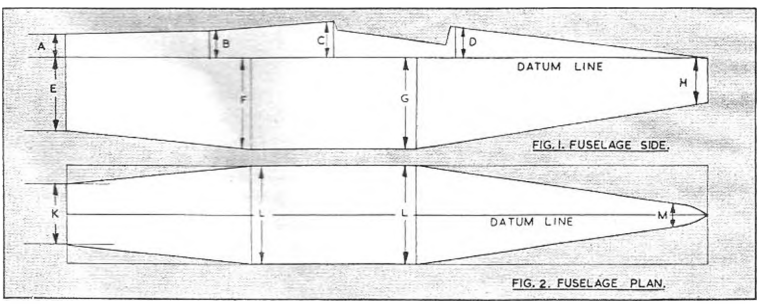


FIG. 1. FUSELAGE SIDE.

FIG. 2. FUSELAGE PLAN.

we take our 1/72 scale drawing, and draw a vertical line. at the nose of the machine, and at right angles to the datum line, which is the straight line running from nose to tail on the side view of the machine, and generally it indicates the position of the top longerons. From these two lines on the scale drawing, we plot all our subsequent working drawing dimensions.

I should, perhaps, halt here to give a few words of warning. I have given a scale of $\frac{1}{8}$th full size as a practical flying scale model, when powered with a 1 c.c. motor, but I would point out that this scale holds good only when the completed machine—if a monoplane—has a wingspan of 40 in-48 in., or, if a biplane of 38 in.-42 in. Now a $\frac{1}{8}$th scale model of, let us say, the 1918 D.H.9A., would have a wing span of 68 in., which would be hopelessly underpowered by a 1 c.c. motor. If I were designing a model of this type, I would enlarge all 1/72 scale drawings by six—not nine—which would give a wing span of 45 in. A really good 1 c.c. motor might possibly fly a machine of this wingspan. but a more powerful motor, such as a Mills Mk. II. 1.3 c.c., would be better.

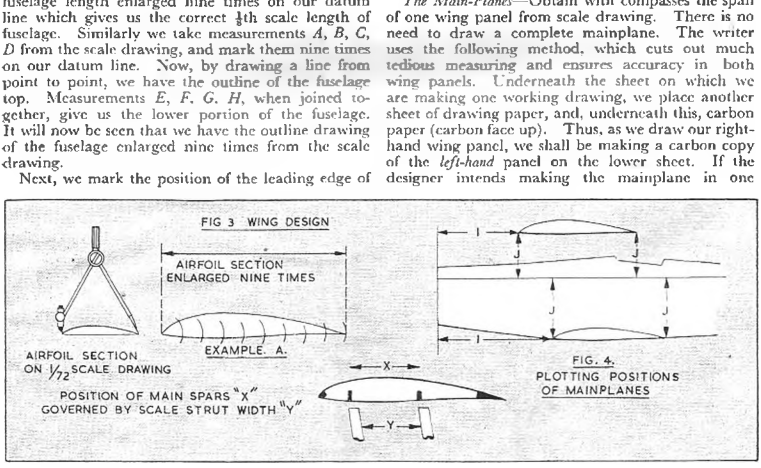
The Fuselage—We now commence our working drawing by ruling a straight line across the sheet, 8 in. from the top, and a vertical line 1 in. from the left-hand edge. These lines correspond to the datum line on the scale drawing and the vertical line we draw at the nose, and are the basis for all dimensions which follow. Now, taking our compasses, we measure the length of the *scale drawing* datum line, from the nose to the stern-post of the machine. We then mark out this distance *nine* times on the datum line of our *working drawing*. Thus we have the fuselage length enlarged nine times on our datum line which gives us the correct $\frac{1}{8}$th scale length of fuselage. Similarly we take measurements *A*, *B*, *C*, *D* from the scale drawing, and mark them nine times on our datum line. Now, by drawing a line from point to point, we have the outline of the fuselage top. Measurements *E*, *F*, *G*, *H*, when joined together, give us the lower portion of the fuselage. It will now be seen that we have the outline drawing of the fuselage enlarged nine times from the scale drawing.

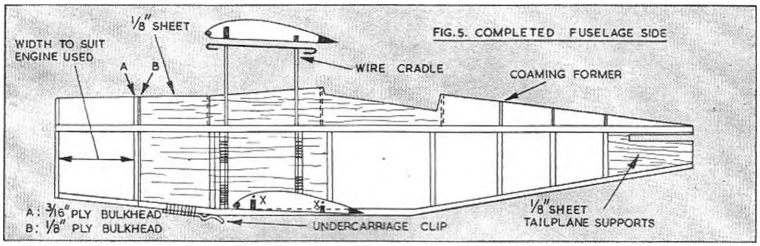
Next, we mark the position of the leading edge of the top mainplane by taking the measurements *I* and *J* on the scale drawing. From this position, we draw a thick straight horizontal line, corresponding to the chord of the scale drawing mainplane. This gives us the position of the top mainplane. In the same way, we measure the distance of the lower mainplane from the nose and draw another thick straight line to represent the chord of the lower plane. Finally, we mark the position of the front and rear undercarriage legs.

Let us call a halt here, and see how far we have come. We have before us the fuselage side outline, identical in shape with that of the 1/72 scale drawing, but enlarged nine times, with two thick black lines indicating the upper and lower mainplanes. All that remains is for us to measure with our compasses, the distance of the cockpit from the nose, and to transfer this measurement to our working drawing. Here for the time being we leave this particular drawing.

We now have to draw the fuselage plan enlarged from the scale drawing. We commence by drawing a datum line down the centre of the fuselage plan on the scale drawing, and two parallel lines along the widest part of the fuselage, (see Fig. 2). We draw a corresponding datum line on our working drawing, and measure the dimensions at *K*, *L* and *M* on the scale 1/72 drawing. The dimension *L* enlarged nine times, gives us the correct $\frac{1}{8}$th fuselage width, and two parellel lines, equidistant from the datum line, are drawn as shown. Finally, transfer *K* and *M* dimensions from 1/72 plan, enlarged to scale, on to working drawing. Thus, we have the varying widths of the fuselage plotted, and we draw in the outline of the longerons.

The Main-Planes—Obtain with compasses the span of one wing panel from scale drawing. There is no need to draw a complete mainplane. The writer uses the following method, which cuts out much tedious measuring and ensures accuracy in both wing panels. Underneath the sheet on which we are making one working drawing, we place another sheet of drawing paper, and, underneath this, carbon paper (carbon face up). Thus, as we draw our right-hand wing panel, we shall be making a carbon copy of the *left-hand* panel on the lower sheet. If the designer intends making the mainplane in one





unit, he simply butt-joins the two drawings. We now draw the leading edge, and likewise the chord. Add the trailing edge, and we have the outline of one wing panel. Now that we have the outline drawing of the right-hand wing panel, we draw in, first, the interplane stout rib position, using the compasses. Next the centre section "cut-away" marking the position where the dihedral angle commences. The remaining ribs I generally space 1½ in. apart. Then we draw the mainspar positions, and these are generally dictated but the position of the interplane struts on the prototype. Finally, draw in the outline of the wing tip. If this is curved, and you doubt your ability to draw it freehand on the working drawing, draw it out on thin card. When satisfied you have the right curvature, cut it out, place it on the plan in position, and draw around it.

If both mainplanes are of equal span and chord, you will be able to use the drawings for both wings, but if not, you will have to draw the lower plane in the same manner as the upper. Do not forget to allow for the width of the fuselage when using the drawings to construct the lower mainplane. The centre section ribs for the lower wing should be "dotted-in" on the plan, to avoid confusion with the top wing ribs.

Tail Surfaces—I do not think there is any need to go into details regarding the planning and drawing of the tail surfaces. They are done in the same way as the mainplane. If, however, the leading or trailing edges are curved, and you cannot draw these curves accurately, proceed as follows. Draw mainspar, and across it at right-angles, draw lines representing the ribs. Now take a strip of wood, and bend it round these lines, in the position where the leading or trailing edge would come on drawing. Hold it in position with pins and draw round it. This will give you the correct shape. As regards the tailplane, when you have obtained the dimensions from the 1/72nd drawing, enlarge them up nine times, and add 1 in. to the span, and ½ in. to the chord. Thus, if the true scaled-up dimension of the tailplane is 12 in., make it 13 in on your drawing, and similiarly with the chord. The rudder may be drawn correct ⅛th scale size.

Now we must go back to one side drawing (Fig. 5) of the fuselage. First, we mark out our airfoil section ("Clark Y") to the correct size, draw in positions of main spars and cut it out in $\frac{1}{16}$ in. plywood. We first of all lay this plywood rib on the line, marking the top wing, and raise the leading edge of the rib, to give ⅛ in. incidence. Now draw around it, thus leaving the airfoil section on the plan in the correct position for the mainplane. Do the same for the lower mainplane, giving $\frac{1}{16}$ in. incidence. Then, before lifting the rib from the plan, prick through it on to the plan at two points directly above the mainspars X-X. Mark these pricks clearly on the plan, and keep the rib for a template for making your wing ribs. The marked pricks on the plan, show where rolled paper tubes are cemented across the fuselage for the lower wing fixing see sketch. It will now be seen that we have a finished outline drawing of the fuselage, showing correct wing positions, and giving correct wing gap, stagger, and incidences.

If the centre section wing struts are "splayed," it will be necessary to make a drawing of the front view of the machine, in order to obtain the correct length of these struts, but this drawing need be only a very simple one, as it is not used in the actual construction of the model. Next the fuselage coaming formers *C* to *H*. If these are semicircular we can easily draw them with the compasses, but if oval, we shall have to draw them freehand on thin card. Obtain heights and widths from the working drawing, and draw on cards. These may be cut out, and used as templates when marking out on balsa sheet.

The motor is bolted to bulkhead *A* which is attached to bulkhead *B* with woodscrews to allow alteration to side-thrust and down-thrust for trimming purposes.

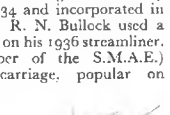
We have now reached the last stage. Bearing in mind that we are designing a ¼th scale model, we shall be using $\frac{1}{16}$ in. sq. longerons, and spaces and we line these in on the fuselage drawings. I generally fit the spacers 2½ in. apart, but this may be varied according to the position of the centre section struts.

We now have a set of working drawings scaled up from 1/72nd to ¼th full size. In the next article I will give practical instructions for building a biplane from these drawings, showing how a stable, steady flying, and practically crash-proof model can be constructed.

MORE FAMOUS FIRSTS

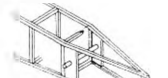
Plug-in Undercarriage—The simple bamboo leg plugging into paper tubes in the fuselage was certainly used by Gordon Light in 1934 and incorporated in his 1935 Wakefield winner. R. N. Bullock used a similar plug-in undercarriage on his 1936 streamliner. T. Newall (founder member of the S.M.A.E.) invented the wire undercarriage, popular on Wakefields *circa* 1939.

Rear Peg—Prior to 1936-7, almost without exception a hook was used as a rear rubber anchorage. It is difficult to trace who first thought of using a bamboo peg to replace this hook, but almost certainly it was the outcome of the invention of the bobbin. This little detail is now accepted the world over.



Tensioned Motors—Were almost unknown until the mid-1930's, motors being made up equal to the distance between hooks with no slack. Longer motors meant more turns and once a form of tensioning was introduced became universal. First tensioners were mechanical—and of form used today with folding propellers—and originated in this country. A further scheme—cording—was later introduced by H. E. White, corded motors now being the general rule for all rubber models with free-wheeling propellers.

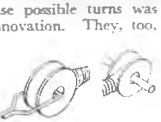
Stretch Winding—To increase possible turns was undoubtedly an American innovation. They, too, believed in stretching to the limit—some six times the motor length before putting on turns. Stretch winding was general in this country by about 1935.

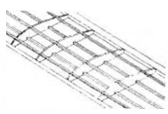


Bobbins—Another little detail for eliminating motor troubles, were introduced by C. A. Rippon and comprise one of the simplest and most useful accessories ever made available to rubber modellers.

On the structural side of rubber models, some of the major developments are:—

Wound Formers—For streamlined fuselages, replacing the heavier, weak laminated sheet bulk-heads. Introduced by C. A. Rippon, who made the first of 1 mm. ply. Were found more rigid and considerably lighter wound fro... balsa, Bob Copland being the first to use this material.



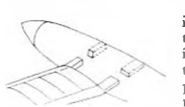


Sparless Wings—Which have proved so popular, were first used by R. N. Bullock.

Multi-Spar Wings—Originated in the Cleveland club, U.S.A., with either Korda or Lanzo, or both.

Plug-in Wings—Of the sparless type below, again by R. N. Bullock.

Tongue-and-Box Wings—Have been fairly generally used, but an early outstanding example is Bob Copland's G.B.3.



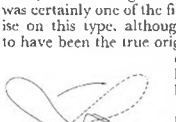
Triangulated Spars — The inherent weakness of the tongue-and-box wing (localised at the end of the tongue (or box)), is completely overcome by the triangulated spar layout developed by Ron Warring, which finally made the shoulder-wing, monospar wing a practical proposition.

Anti-spin Fins—Are another outcome of the development of the streamlined slabsider, again by Ron Warring. Outrigged fins as on Copland's earlier G.B.3 were used to increase directional stability.

Hubless Wheels—For a final cleaning-up of the undercarriage of a streamliner were first used by R. N. Bullock.

Free-wheeling Propellers—Were in general use in the early 1930's and examples can be traced back to 1914.

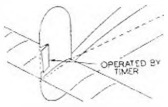
Folding Propellers—Are really an American development, first coming into use around 1937. Cahill was certainly one of the first contest fliers to standardise on this type, although Roy Marquardt appears to have been the true originator. One of the earliest examples of folding propellers seen in this country was by Henerey of T.M.A.C.



Downthrust—Was invented by the late Charles Burchell about 1924.

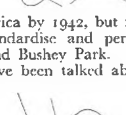
Dethermalisers—Were used first by Dick Korda, in the form of a timer-operated tab on the fin to spin the model down. In this country, Norman Lees was first to use a D/T, employing the same principle, but making his own special lightweight airdraulic timer. Ron Warring appears to have been the first to suggest and drag test a parachute. Bob Copland the first to use a chute. All the early

D/T's of these types were timer - operated. The b.p.-up time dethermaliser now being applied to rubber models, was first used by Carl Goldberg on a power duration model—the *Interceptor*.



Fuses—Were in use in America by 1942, but first clubs in this country to standardise and perfect this method were Croydon and Bushey Park.

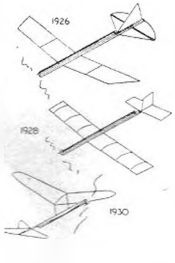
Variable Pitch Propellers—Have been talked about for many years, the earliest generally appearing in the form of a suggested layout in a magazine article. There is still no "standard" type for model work, although some of the pre-war Continental Wakefields used them. Outstanding British pre-war examples were by Henerey and C. A. Rippon. Later types include Ron Warring's design used for r.t.p. work (*Model Aeronautical Digest*, 1944) and, more recently, Bob Copland's Wakefield type (1948), and E. W. Evans's feathering propeller (1949). R.T.P. model origin must again be credited to R. N. Bullock and some highlights in the development of this type are:—



First three minute flight, Ron Warring (1939); first three minute flight (standard S.M.A.E. rules), K. Young (1941); first four minute flight, Bob Copland (1944); first five minute flight, Ronnie Rock (1946).

First electric powered r.t.p. model which type subsequently became popular for exhibition work.

Microfilm Covered Surfaces—Were used for the first time on r.t.p. models by Bob Copland, although a contemporary American magazine article shows that they had similarly tried an all-microfilm covered r.t.p. fuselage model.



Microfilm itself was first used by Kittel in 1931 and marked a big step in the development of the indoor free flight duration model. Leading developments in indoor free flight were:—

Cambered wings—McCoy, 1928.

Hollow motor stick—1928, followed by polyhedral wings.

Parasol wing mounting—came into general use during 1930-1.

Microfilm-covered propellers—1935.

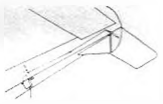
Torque Testing—As applied to rubber motors was probably first used prior to the 1914-18 war, but the now standard type of torque tester as used for testing contest motors was the work of the 1939 Wakefield team, notably A. F. Houlberg and Bob Copland. Copland and Warring both used the method for r.t.p. models, 1939-40 (getting out very accurate graphs of duration of flight against turns for different motors) and these two are still probably the leading exponents of rubber tests by such methods. C. A. Rippon devised and demonstrated a torque tester with an electrically-reading scale, 1940-41.

Glider Launching—By line and dropping hook was invented and demonstrated by Messrs. Payley and Rippon in the early days of the S.M.A.E.

Offset Towhooks—Used widely on glides for obtaining a straight tow with rubber offset were originally introduced by Frank Zaic.

Auto - rudder — A later development where the rudder is hinged and connected to a pivoted tow-hook to give straight rudder for tow and offset rudder for free flight was originally the work of Ron Warring, with a contemporary and similar, yet independent, development by R. F. L. Gosling (1942-3).

Rudder Lock—The ultimate form of auto-rudder with positive action was produced by Ron Warring (1945).



Laminar Flow Wings—First on glider models, and then later applied to rubber and power models, were first developed by N. K. Walker and R. H. Annenberg, founders of the L.S.A.R.A. These mathematically-derived wing sections form the subject of a British patent.

S.M.A.E News

CONTEST RESULTS

LADY SHELLEY CUP

1.	Lucas, A. R.	Port Talbot		512
2.	Manuel, W. L.			473.8
3.	Marshall, J.	Hayes		422
4.	Hughes	Merseyside		357
5.	Pope, C.	Upton		286
6.	John, E. J.			278.5
7.	Haskayne, C.	Merseyside		270.5
8.	Andrews, A.	Whitchlesey		223
9.	Bennison, H.	Ipswich		173.6
10	Wyatt, P.			161.8
11.	Draxton, K. R.			153.2
12.	Johnson, K.	Hayes		149.5
13.	Holden, A. M.	Boston		120
14.	King, M.A.	Belfairs		109
15.	Bennett, H. R.			100
16.	Twomey, B. J.	Cardiff		59
17.	Ransom, L.			0

17 Entries

KEIL TROPHY

1.	Pepperrell, D. F.	Edgware	15.26
2.	Wyatt, P.	Ipswich	14.56
3.	Goorwitch, G.	Manor House	12.64
4.	Pilgrim, N.	Birmingham	12.17
5.	Leader, J. E.	Chorley Wood	11.31
6.	Knight, J. B.	Kent Nomads	10.12
7.	Knight, H. J.		9.92
8.	Crabbe, D.	P.M.A.L.	9.8
9.	Roberts, R.	Upton	9.4
10.	Wilson, P.	Knutsford	8.94
11.	Noel, P.	Wayfarers	8.3
12.	Dudley, D. J.	Satyrs	8.25
13.	Jones, D.	Wallasey	8
14.	Atkinson, R.	Ipswich	7.95
15.	Hulme, D.	Knutsford	7.73
16.	Billows, G.	Bristol & West	7.68
17.	Currington, E. G.	Prestwich	7.49
18.	Askew, R.	Cheadle	7.4
19.	Ridgeway, P.	Macclesfield	7.03
20.	Beaumont, D.	Ipswich	6.97

94 Entries

CHANGES OF SECRETARIES

Tees Side M.F.C., now **Stockton & District M.F.C.** *Secretary* : same—L. Tomlinson, 51, Rodney Street, Haverton Hill, Co. Durham.

Bideford & District M.A.C. *Old Secretary* : R. J. Clark, 78, High Street, Bideford, N. Devon ; *Temporary Secretary* : P. J. Fletcher, c.o M. E. Fletcher Ltd., Torridge Hill, Bideford.

Meir Community Centre M.A.C. *Old Secretary* : E. S. Moffatt, 6, The Close, Weston-Coyney, Stoke-on-Trent. *New Secretary* : C. B. Harrison, 238, Weston Road, Meir, Stoke-on-Trent.

Ruislip M.A.C. *Old Secretary* : R. Newton, 19, Westhome Gardens, Ruislip, Middx. *New Secretary* : D. W. Sullivan, 15, Deancroft Road, Eastcote, Middx.

Worthing M.F.C. *Old Secretary* : D. J. Winton, "The Rodge," Findon, Worthing, Sussex. *New Secretary* : R. Pearson, 9, Tervenges Avenue, Tarwing, Worthing.

Durham City M.F.C. *Old Secretary* : G. Jackson, 21, Oswald Terrace South, Castletown, Sunderland, Co. Durham. *New Secretary* : A. J. Nuna, 155, Byerley Road, Shildon, Co. Durham.

Oldham & District M.A.C. *Secretary's change of address* : T. Naylor, 3, Sutcliffe Street, Heyside, Srovy, Nr. Oldham, Lancs. *New address* : T. Naylor, 7, Rochdale Road, Middleton, Manchester.

Reading & District M.A.C. *Old Secretary* : H. W. Jackson, 1a, Victoria Road, Tilehurst, Reading. *New Secretary* : A. C. Shuffle, 67, Gratwicke Road, Tilehurst, Reading.

Southend Senior M.C. (Aircraft Section). *Secretary's change of address* : R. A. Chowns, 125, Manners Way, Prittlewell, Southend, Essex. *New address* : R. A. Chowns, 515, Fairfax Drive, Westcliff.

Mid Sussex A.C. *Old Secretary* : M. Finch, "Quarry Bank," Rookery Way, Haywards Heath, Sussex. *New Secretary* : G. Cooper, 69, New England Road, Haywards Heath.

Norwich M.A.C. *Old Secretary* : C. W. Williment, 39-41, St Benedicts, Norwich, Norfolk. *New Secretary* : P. G. F. Chinn, Hill House, Hele Road, Cromer.

Hull "Pegasus" M.F.C. *Old Secretary*, W. K. Lyth, 178, Beverley Road, Hull. *New Secretary* : G. H. Harrison, 15, Rutland Road, Spring Bank West, Hull.

Dursley M.A.C. *Secretary* : R. B. Petrie, Crowthers, Woodfields, Dursley.

Wimbledon & District M.A.C. (Disbanded.) *Secretary* : W. G. Taylor, 145, Kingston Road, Wimbledon, London, S.W.19

Staines Youth Club Aeromodellers. (Terminated.) *Secretary* : N. Watkins, Celia Crescent, Ashford, Middx.

North East Modellers Assn. M.A.C. (Terminated.) *Secretary* : J. Murray, 30, Kaimhill Circle, Aberdeen.

Morecambe & Heysham M.A.C. (Lapsed.) *Secretary* : J. Pickles 35, South Grove, Morecambe, Lancs.

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.
" 23th 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.

Aug. 13th South Coast Gala, Brighton. (Power duration
" 15th-25th Eaton Bray Rally. classes only.)
" 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

NEWS *from the* CLUBS

SOUTH WESTERN AREA SPRING RALLY

The above event was held at the former Haldon aerodrome, near Teignmouth, on Sunday, April 16th, 1950. The weather was fine, but a fairly stiff breeze was responsible for several crack-ups of what promised to be good models. There were six entries for the Halfax Trophy and five for the Gutteridge Trophy : although two models were brought for the Ripmax Trophy, they did not compete owing to the high wind, and it was not possible to judge their capabilities. In addition to the official S.M.A.E. contests there were two other contests, a Power Scramble on the New Zealand style, and an open Glider Contest, both of which were well supported.
Results :

Halfax Trophy—J. Gill, Junior (Torquay M.A.C.), 106.5 sec. aggregate. *Gutteridge Trophy*—G. W. Woodfine (Plymouth M.F.C.), total 713 sec. *Power Scramble* (13 competitors)—G. Russell (Sidmouth M.A.C.), total 1,531.1 sec. *Open Glider* (16 competitors)—J. Higgins (Torquay M.A.C.), total 549.4 sec.

BARNSLEY AND DIST. M.A.C.

The club's second annual exhibition held on April 14th and 15th, proved to be a great success. Over 60 models of all types were on show as well as a stand with R/C equipment and sectionalised engines. The senior prize was won by R. Addy with his smaller version of the "Rudder Bug," and the junior prize was won by D. Iredale with his own design power model "Electra."

NORTHERN HEIGHTS M.F.C.

The club members have been very enthusiastic about the Bordic Class Glider, and are busy "ragging" comp. secretary Val Turner about his 9 ft. glider, but are now silenced, as Val braved the elements to gain 4th place in the Pilcher Cup, with one flight, but model not being recovered until 8.30 p.m.

Bob Copland flew well in the Gutteridge to gain 3rd place, his model performing very satisfactorily, and showing great promise.

The Gala to be held on July 2nd, 1950, at Langley Airfield, Nr. Slough, will include contests for Rubber, Power, Glider or C/L, in addition to the Queen's Cup and Thurston Helicopter Trophy, valuable prizes being awarded in each contest.

Everyone is welcome, and we look forward to meeting all our friends at Langley.

CROYDON AND DIST. M.A.C.

The brothers Yeabsley have made a very promising start to the competition season, Roy having won the Bill White Memorial Cup held earlier in the year, and Des coming second in the Surbiton Glider Gala.

Garnage Cup day produced its usual weather conditions, but several members braved it and succeeded in completing their flights. Flying lightweights, Jim Tangney gained sixth place and Ed Bennett —home on his first pass from the R.A.F.—a close seventh.

Somewhat worse weather was experienced at the Brighton C/L meet and our Team racer came to grief after getting more than halfway through the eliminator, the wing structure, not being able to take flying stresses *and* the gale at the same time. Speed King Jim Carter had bad luck in the speed event when the lines on his Maraget "29" model snagged on take-off. The resulting loop finished up with a vertical dive into the deck with the nose a good 6 in. in.

Fortunately the weather abated in time for the Spring Rally and Norm Marcus gained top place for the area in the Halfax Trophy. On the same day our Wakefield exponent, Mr. Pitcher flew his usual design into third position in the Gutteridge, one of his flights being of 28 min. duration.

YORK M.A.S.

In perfect flying weather 1,000 aeromodellers and supporters gathered at Rufforth (Nr. York) for the first Area Rally. The first R/C sailplane at Rufforth made a flight of 200 sec., o.o.s. Flown by members of the Sheffield Club, it held the wind for 2 minutes, then turned down-wind and out of range of the transmitter. Roy Hodgson set up a club junior record for open glider by watching his "Dream Bogey" fly o.o.s. in 380 sec. on his first flight in the Area Glider comp. Unfortunately it wasn't recovered in time to continue in the comp. Tha'll larn to fight that fuse yet, son ! No comp. was declared for the Ripmax. Both entries scratched after initial flights.

Several members are planning (and boosting) Nordic A/2 designs for future meetings. York, at any rate, think it is a coming thing !

The big "Glider Bug" is catching on, too. Ron Firth hopes to fly his "Thunder King" in the Nationals. T. Heselwood also has a 9 ft. job own design ready, but trials have yet to be completed before the verdict is given. If successful, it is ready for the R/C set !

WESTERN AREA SPRING RALLY

The above was held at Yeovilton (H.M.S. *Heron*), Naval Air Station, Nr. Yeovil, Somerset on April 16th, 1950.

The day dawned well for model flying conditions and by 10 o'clock some 100 and more modellers and families were either watching, flying or repairing !

All clubs in the Area seemed to be in attendance and seven clubs actually took part in events. These were from Yeovil, Bristol, Trowbridge, Bath, Swindon, Gloucester, etc.

Harry Middleton (Bristol and West. M.A.C.) topped the Halfax entries with 422.8 sec. and G. Woolls (Bristol and West M.A.C.) led the Gutteridge entries with 830.2 secs.

Seen around the field was a beautiful scale model of a D. H. Beaver, built by A. Walter (Bristol & W. M.A.C.) ; Nieuports by Messrs. Ross & Co. (Bristol and W. M.A.C.), and an R/C glider by a Gloucester M.A.C. modeller. Our thanks to the Yeovil M.A.C., Mr. H. Middleton (Comp. Secretary Area), the Commanding Officer, H.M.S. *Heron* for allowing us to use the 'drome and much help and assistance during the day in the shape of his allowing us the freedom of a nice part of the 'drome for trimming, etc.

PETERBOROUGH M.A.C.

The Club held its third exhibition during Easter week, when about 2,000 people attended. Messrs. C. S. Rushbrooke, E. F. H. Cosh and C. A. Rippon judged the exhibits. (No one can swear at the judges for not knowing their job this year.) There were about 140 entries and in addition to the almost continuous C/L and r.t.p. flying, there was also a cinema showing aeronautical films.

Bruno Gooding put up some pretty flying with his Elfin power S.E.5A which incidentally gained him the Harlow Cup.

Prizewinners were as follows : *Power*—Free-flight (1) A. Pennington (Wisbech M.A.C.), Centurion. Scale (1) J. Phillips (Peterboro), Avro 504K. *C/L*—Stunt, (1) R. A. Stagles (Wisbech M.A.C.) Speed (1) D. R. Coates (Peterboro), Inferno (jet powered). Scale (1) C. W. G. Bell (Wisbech M.A.C.), Typhoon. *Rubber*—(1) L. Fisher (Wisbech M.A.C.), Contestor. *Sailplane*—(1) D. A. and S. Laxton (Oundle M.A.C.), Thermalist. *Solids* (1) J. Lee (Peterboro M.A.C.) *Experimental*—(1) L. G. Hall (Huntingdon M.A.C.), Canard.

GLASGOW M.A.C.

The 1950 K.L.M. (Flying Dutchman) Trophy Contest will be held at Abbotsinch, Paisley, on Sunday, August 6th, under the direction of the Glasgow Club. All Scottish clubs will receive entry forms and rules in due course, but individuals may obtain further particulars from either Mr. R. Todd, 273, New Edinburgh Road, Viewpark, Uddingston, Glasgow, or Mr. J. Fergusson, 14, Larg Street, Paisley. The contest will be for Power-Duration, and is restricted to Scottish modellers.

BREDBURY AND ROMILEY M.A.C.

The present club records are :—

Power—G. Aitken, 9 min. 36 sec. o.o.s., made with an Amco 3.5 c.c. powered "Super Slicker." Plane found seventeen miles away.

Glider—W. Gidman, 10 min. o.o.s. an original glider of 48 in. span. The model disappeared into cloud and has not been seen since.

Rubber—A. Freeborough, 3 min. 15 sec. an original rubber model of about 40 in. span.

W. Delaney senior and junior are building an R/C job with home built radio, receiver, etc. The model will be either a Stentorian or an Eros, with "Wildcat" power.

The Club possess a good clubroom and a reasonably good flying field. Last year we had a balance of £33. This is being used to buy transfers, stopwatches, and helping to keep the prices of charabanc trips down. We are soon to have a contest for 20 Wakefield tickets.

PARK M.A.E.

The last month has been one of strenuous activity particularly for Mr. Dabbs who flew Mr. Briggs' C/L scale "Lancaster" for the first time, the flight ending suddenly when a line snapped. Not much damage was caused, but it gained Mr. Briggs some prominence in the local press.

The first round of the London Area Challenge Competition followed hard on the club beating Bushy Park in quite windy weather with an aggregate of over 2,000 sec., Hubert Latham doing well with his 6 ft. glider.

The Gutteridge Trophy came next, in which Messrs. Stuart, McKenna Pullen and Sallabank had some moderate success. W. Hinks got rather jaded and Sallabank finished up with a mid-air collision near the end of his third flight.

There was a short interlude in which the Club became road-hogs and went to the Odiham M.A.C. Gala, the only noticeable point being the second flight while there of Mr. Briggs' "Lancaster," this time with more success.

The month finished up with the Club flying against Pharos in the second round of the London Area, beating them by 400 points. Pharos had bad luck in losing one of their big "Thunder King" gliders on its first flight, the dethermaliser not doing its proper job. Parody and Sallabank did "text-book" first flights of 5 min. plus in a day of few thermals.

LEICESTER M.A.C.

The club held an Exhibition on Easter Monday, Tuesday and Wednesday, which was very successful.

The opening ceremony was performed by the Lord Mayor of Leicester (Alderman J. W. Wale) who said that exhibitions of hobbies such as ours had made him realise that for every juvenile delinquent who made the headlines there were a score who developed initiative and a healthy interest in other people's activities by their hobbies and the clubs to which they belonged.

The standard of the exhibits were very high, and the absence of pylon types was very noticeable ; the surprise being the number of R/C jobs which made us hastily form a separate class for these types.

Prizewinners were as follows :

Best plane in the show and Club Concours—(1) Gordon Hallam, low wing semi-scale (Miles). *Open Power*—(1) G. E. Dunmore, Super Buccaneer. *Open Glider* (1) G. E. Dunmore. *Control-Line*—(1) Ray Tailby. *Open Rubber*—(1) Jack Marsh. *Novices*—(1) Bob Manning, " Chryslea Ace."

FARNHAM M.A.C.

During the local Youth Week the Farnham M.A.C. gave a C/L demonstration and static exhibition. The flying had to be confined to 40 min., but in that time the spectators were fully entertained.

The flying commenced with J. Mitchell and M. P. Hayter flying " Phantom " and " Nancy " respectively attempting to tear paper streamers, next came B. White with his own design biplane (the only crash—it is now a low wing monoplane). R. Smith then flew his Frog powered " Stunt King," which really gave the crowd a thrill. J. Mitchell flew again, this time a bright red " Musketeer " its maiden flight ; this was undoubtedly the highlight of the proceedings. To round off, L. Bramehely and M. P. Hayter flew " Nancy " and " Happy Harold " in more paper streamer tearing. How they managed not to collide not even they know. Only the highest praise is due to the ground staff and hangers-on who rushed about with fuel and accumulators in order to " keep 'em flying."

Afterwards the models that were flown joined others in the close-by Church House. Here the most admired model was a beautifully finished Dakota (D.C.3) power by two E.D. Bees, the scale was approximately 1/24 and it was built by Mr. Vince. The new Secretary is M. P. Hayter, 25, Tor Road, Farnham, Surrey.

WHITEFIELD M.A.C.

Bad weather in the last month has meant no spectacular times, but a certain amount of flying both contest and otherwise has been managed.

The club Power Ratio Trophy was held in conjunction with the decentralised Kiel Trophy on April 30th, and resulted in a win for S. J. Williams with an average ratio of 4.9, bad weather accounting for low times.

A couple of " flying saucers " turned up for the Lady Shelley, but appeared rather unstable and were not flown in the contest.

In the K.M.A.A. Cup for A/2 gliders, A. Cropper came second in the N.W. Area with an aggregate of 390 sec.

Two members are expected to reach the Wakefield 100, namely, R. Woodhouse and H. O'Donnell, being 2nd and 6th in the N.W. Area and combined totals for the Gutteridge and Weston.

SWINDON M.A.C.

In spite of early morning rain, which must have kept many at home, the Swindon Model Aero Club's Annual Slope-Soaring Contest proved an all-round success and attracted clubs from Yeovil, Bristol, Bath, Trowbridge, Malmesbury, Marlborough, Devizes, Yatesbury and Cirencester, to say nothing of the " lone wolves " !

Models were not helped by the slightly damp atmosphere which prevailed throughout the greater part of the day, nevertheless, some beautiful, soaring flights were witnessed during a bright spell, prior to the contest, when some of the Yeovil lads—who must have got up with the lark and were first at the contest area—were recording times of up to seven minutes ! The final times are indicative of the " falling off " of these earlier conditions.

The smooth running of the contest, aided by the *grand co-operation of the visiting clubs*, did much towards bringing it to an early close leaving time for a couple of " quickies "—these being a Power Ratio and Rubber Duration—so bringing an enjoyable day to an exciting and successful conclusion.

Results :

Slope Soaring Contest—(1) P. Gosney (Yeovil), 2-flight, aggregate 182.9 sec. ; (2) G. Genner (Swindon), 2-flight, aggregate 164.0 sec. ; (3) R. Parsons (Swindon), 2-flight, aggregate 136.8 sec.

Power Ratio Contest.- (1) R. Smith (Swindon), ratio 9.4 ; (2) R. Hillman (Bristol), ratio 5.1.

Rubber Duration Contest—(1) G. S. Perry (Yeovil) with 107 sec. ; (2) F. Mann (Yeovil) with 32.5 sec.

Congratulations to Yeovil !—It would appear that the " early bird " *does* " get the worm " after all ! !

SOUTH WALES AREA

The following Area Rallies will be held during 1950 on Fairwood Aerodrome near Swansea. Flying will commence at 11.00 a.m., and cease by 7.00 p.m. Entries for the events should reach the area secretary by the first post of the preceding Friday, but late entries may be made on the field at the discretion of the judges. A late entry fee of 1s. will be made.

August 13th—Welsh Rally

Tod Lewis Cup—Open Rubber.

Area Open Power Duration (30 sec. engine run).

Area Open Glider.

Area C.L Contest—Team Racing.

John Hayman Club Championship Cup.

September 3rd—Area Autumn Rally

Farrow Shield—Unrestricted Team Rubber.

" M.E." Cup. 6—Team Glider.

Astral Trophy—Power Ratio.

WORCESTER M.A.C.

We have been set off to a good start this season by Reg Parham who has raised two indoor records, and won the Gutteridge Trophy.

C.L speed flying is taking up most of Alan Viles' time, and he has reached 129 m.p.h. with his Class VI job, which is powered by one o Tom Lunn's 10 c.c. motors having twin glow-plugs.

Stunt flying is losing its popularity ; free-flight power and Wakefield kites are appearing once more. John Bishop has two Arden powered pylon jobs of his own design ready, and we look forward to their tests.

A group of members of the Ravensbourne Model Flying Club with some of their fine models.

PRESTWICH M.A.S.

On the day before the Halfax Trophy, E. Currington lost his Mills powered own design model for 6.00 o.o.s., and has not had it returned since. In the Gutteridge Trophy, D. Bennett did 6 : 15 o.o.s. with his Zombie on his 1st flight, the model travelled about 6 miles. In the Keil Trophy, E. Currington obtained a total ratio of 22.5 On April 30th, two A/2 gliders were tested and seemed very promising averaging about 1 : 35 off a 100 ft. line. D. Bennett saved his A/2 from a strong thermal with a D/t after 3 : 20.

NORTH HAMPSHIRE RALLY

Results : *Open Power*—(1) R. A. Ward (Croydon), 568.0 sec. ; (2) J. C. Crowson (Newbury), 280.6 sec. ; (3) B. J. Lanham (West Essex), 269.4 sec.

Open Rubber—(1) A. G. Rodaway (West Middx.), 577.1 sec. ; (2) E. G. Davies (Berkhamsted) 571.2 sec. ; (3) F. Allaker (Surbiton) 563.6 sec.

Open Glider—(1) D. Yeabsley (Croydon) 633.8 sec. ; (2) G. Fuller (St. Albans) 541.0 sec. ; (3) B. Chambers (Croydon) 509.5 sec.

Radio Control—(1) G. Honnest-Redlich (Bushy Park) 105 points ; (2) Col. J. D. Taplin (I. of Thanet), 90 points ; (3) C. White (Eastleigh), 85 points.

Concours d'Elegance—(1) P. Rock (Southampton) ; (2) K. Waller (Petersfield).

Control-line Aerobatic—(1) J. P. Butters (St. Albans), 274 points ; (2) A. Piacentini (Salisbury), 262 ; (3) L. Steward (West Essex), 257 points.

WEST ESSEX AEROMODELLERS

The journey south for the S.E. Area C/L Championships gave good results for West Essex, with " Stoo " L. Stewart, " Funf " W. Taylor tieing for 1st place ; K. Muscutt 2nd. D. Allen 3rd. The old stars still shine. K. Muscutt did get 2nd place, half-way through his pattern, the wing-tip weights, flew off from his 6 ft. stunt job.

SWANSEA A.C.

The strength of the club has steadily grown through the winter months, standing now at fifty-five active members.

Last year's Wakefield Team member, Frank Holland, seems determined to get to Finland this year and finished second to R. Cole's Clipper in the Area Gutteridge. He has built quite a mortuary of Zombies over the long, dark winter evenings. Third in the Gutteridge was John Hayman flying a Jaguar ; the times were, 536, 455.2 and 387 sec. Les Webb, the oldest hand in the club at Wakefields (been building them since 1936) had the bad luck which has dogged him for two years now. We hope his luck will change in time for the Weston Cup. His latest Wakefield is a cabin job, using the Sigurd Isaacson sections, which has an excellent climb and a glide little short of miraculous.

On June 4th the club are organising a Rally offering first class prizes to the value of about £20. Arrangements are, however, temporarily held up due to the fact that the National Air Races are provisionally fixed for that date also on Fairwood Aerodrome and, consultation between the club and Swansea Aero Club, who will be the hosts on the Air Race day, is necessary. Should things work out as we hope, we shall, of course, inform all clubs via the Area Secretaries.

A Rally run in conjunction with an event of this sort should be a great attraction for any aeromodeller.

BRISTOL AND WEST M.A.C.

A large contingent of the club visited Yeovilton for the Western Area Spring Rally, and George Wools, flying his " Witch " came on top of the Gutteridge with 793, while Harry Middleton walked off with the Halfax contest. If George Wools and his " Witch " don't get to Finland it won't be for lack of trying.

The club held a C/L Stunt Contest at Lulsgate on April 23rd. This was won by A. G. Taig. Allan Coles had bad joy with his engine, and this terminated what was otherwise a beautiful performance.

Lulsgate Aerodrome and its attached clubroom are going strong, and weather permitting we are in for a good season.

BLACKHEATH M.F.C.

At Fairlop recently, Hewett's Amco " 87 " pylon model went o.o.s. in 4 minutes from a hand launch, swiftly followed by owner. Some hours later Mr. Hewett returned with his model, which he had seen land in a field, 50 minutes after the launch. His chief grouse was the 4d. return bus fare.

Earlier in the morning M. Jobling's chuck-glider got wanderlust and went away in 25½ sec. The model landed in a backgarden some 4 miles away at 12.50 p.m. approximately 90 minutes after launching. That's how to make sixpence go a long way !

Top rubber men at the moment are Hewett and Snewin, a newcomer.

SOUTHERN CROSS A.C.

Useful publicity for aeromodelling in general and the club in particular was provided by the third of the Club's annual exhibitions which opened in Brighton on Easter Saturday. The opening ceremony was performed by Mr. A. F. Houlberg, A.F.R.Ae.S, who also judged the exhibits. One local M.P. and local councillors who attended were very impressed by the high standard of the models exhibited. J. Fulker won the championship trophy for the second year in succession. This time with a scale C/L model of a Spitfire 22. Junior champion was J. Gander of Southwick who exhibited a scale Avro 504K.

All the best dressed Press photographers apparently now sport natty headgear. The above photograph, which was taken at the last year's " Daily Dispatch " rally at Woodford Aerodrome, is not of the " Model Aircraft " photographer, who, incidentally, prefers to stick to his rather battered cap.

BRIGHTON AND DISTRICT M.A.C.

The above club are holding their Annual South Coast Gala Day on Sunday, August 13th next, at a venue near Brighton. This is the only meeting in England where power flying in classes on the basis of engine capacity takes place.

Rules this year are Power Duration H.L., Engine run 20 sec., three flights. Prizes include the following challenge cups : Class A, Chattri Cup ; Class B, Brighton Cup ; Class C, South Coast Power Trophy. The gala champion will be awarded the Sussex Cup. In addition there will be other prizes such as picnic cases, lighters, beer tankards, etc.

EAST ANGLIAN AREA SPRING RALLY

The above meeting was held at Willingdale on April 16th. The day dawned with seemingly ideal weather conditions, the wind truly being " light and variable." But unfortunately, except for a short spell around mid-day, the air seemed quite dead, and lift absent. The standard of flying seemed much improved, probably because of the wonderfully friendly exchange of " know-how " between individuals and clubs at last year's meetings.

Highest scores were : *Gutteridge Trophy*—P. Hewitt (Halstead M.F.C.), 670 sec.

Halfax Trophy—P. Wyatt (Ipswich M.A.C.), 570 sec.

There were several R/C models flying during the day, only one of which, a Rudderbug flown by Mr. Gorham, was a starter for the Ripmax Trophy. He completed two legs of the course, scoring 190 out of the possible 310 points, before the failure of the actuator battery ended his attempt.

WOLVES M.A.C.

We have made a good start to the competition season, D. Hill and J. Richmond doing particularly well. J. Richmond has so far placed second in the Gamage Cup, won the rubber event at Evesham, and won the Midland Area Junior Championship. D. Hill placed second in the rubber at Evesham and won the Midland Area Senior Championship by a 6th place in the rubber and a 4th in the power. We also placed 3rd in the Stunt and 3rd in the Power at Evesham.

We have four original A/2 glider designs in the club. On Sunday April 23rd, D. Hills model clocked 2.18 off barely 100 ft. of line and P. S. Lindsay's model 2.31 off the same line—the weather was gusty.

We are going all out for the Pluage Cup, and are determined to gain a higher position than last year's eighth.

We are sorry to lose S. A. Ward, one of our best competition fliers, who has had to go to Manchester ; his consistent flying and sound designs will be very much missed.

MODEL Aircraft

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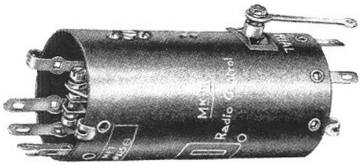

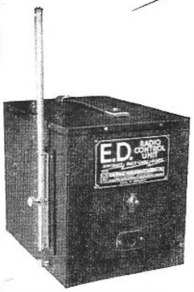

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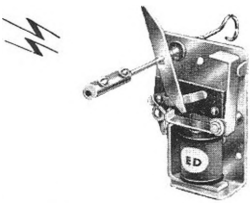

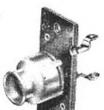

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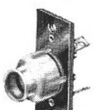

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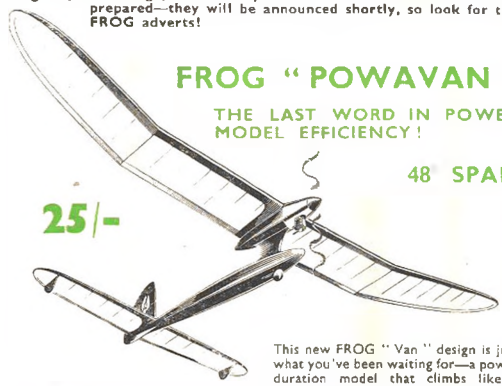
The models shown on this page are just a few of the FROG "performance-plus" kits now in your local model shops. Other new designs by A. A. Judge, C. T. Buffery and J. R. Vanderbeek are now being prepared—they will be announced shortly, so look for the FROG adverts!



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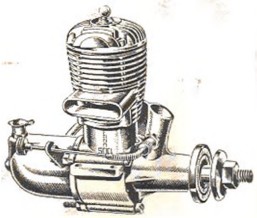

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