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APRIL 1960

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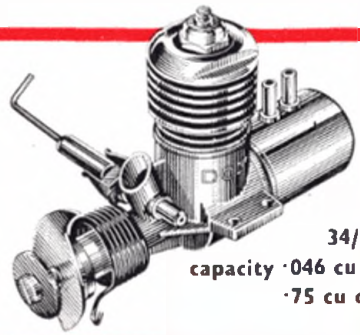

34/10
capacity ·046 cu in
·75 cu cm

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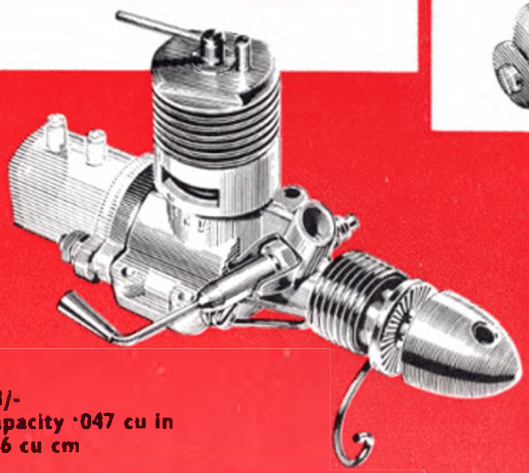
Typifying the range and quality of Davies-Charlton diesels, this superb unit is noted for its advanced design, easy starting, dependable performance.



53/-
capacity ·047 cu in
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½ pint 3/-; 1 pint 5/-

QUICKSTART FUEL
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Get the best from your engine with this super fuel. A blend of high quality oils and chemicals formulated to ensure instant starting, maximum power, long engine life. There is a grade for glowplugs and one for diesels.

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The handling, care and maintenance of model diesels clearly explained by experts. An invaluable aid to trouble-free flying. Send 1/- (P.O. or stamps) for your copy *today*.

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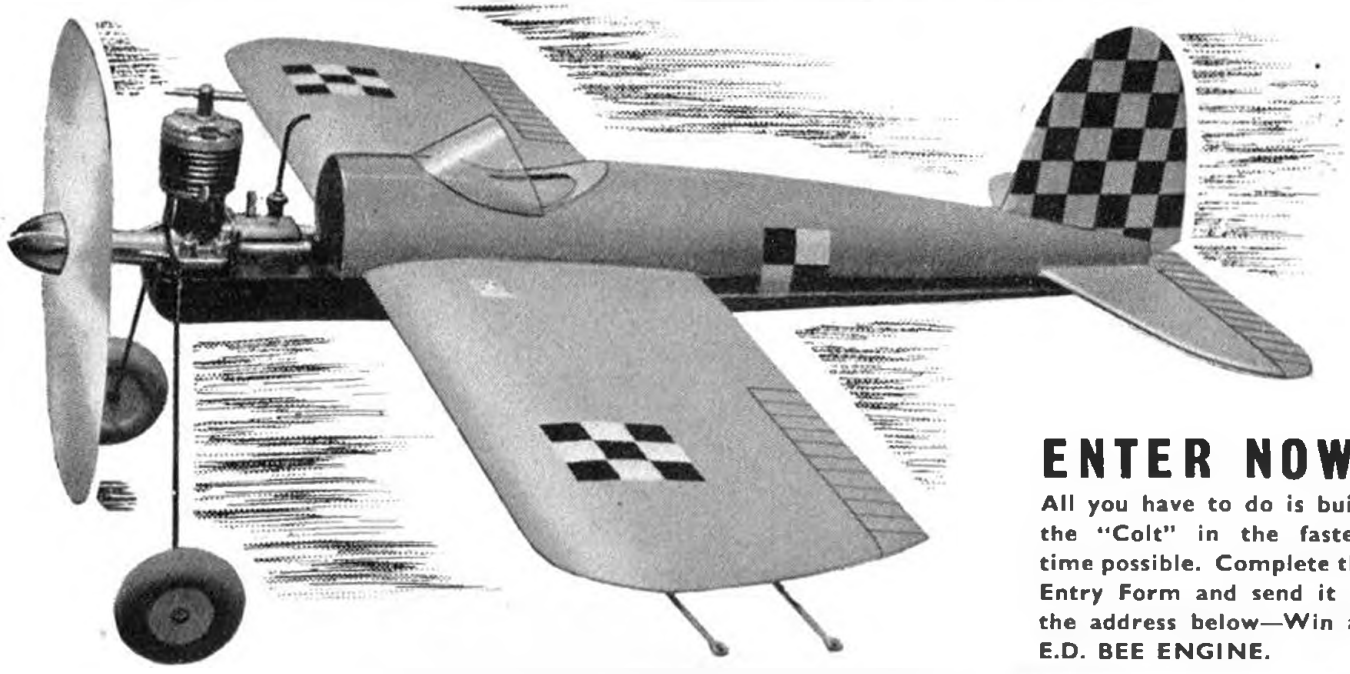
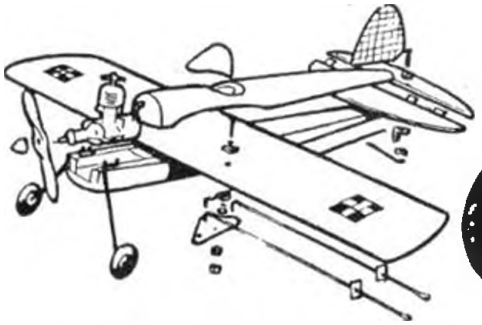


The UNIVERSAL CONTROL LINE TRAINER



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Exploded view shows just how easy the Designers have made it for you!
Wing has finished aerofoil section—hole drilled for fulcrum—fully shaped, hollowed and slotted fuselage halves—ready located hardwood motor beams—Under carriage ready-to-fit complete with sorbo wheels—All necessary wire and hardware parts—Bright checker transfers for decor. Suitable for .5 to 1.49 c.c. Diesel or Glow motors, with integral tanks—You just bolt the motor in place, that's all!

PRICE **27/6**

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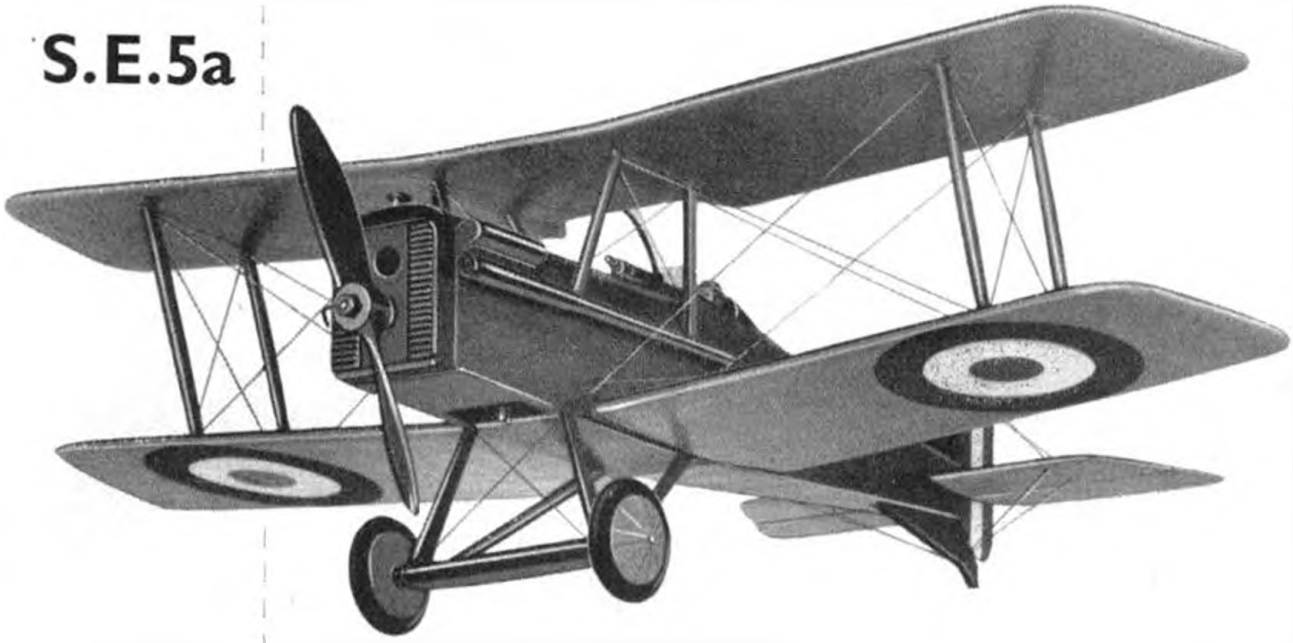
a NEW super scale model . . .

S.E.5a



22 in. SPAN. WT. ALL UP 12 OZ.

A Super C/L Kit of this world-famous fighter. An easy model to fly, and fitted with the Frog "150R" motor, this model will perform many stunt manoeuvres. The kit has all balsa wood and ply parts accurately cut to shape, nylon bell crank, plastic pilot, soft plastic tyres of correct shape, fuel tank parts and a full set of coloured transfers, detailed instructions and drawings.

32/6

A MUST for the Scale Model Fan!

USE ONE OF THESE FROG MOTORS IN THE S.E.5a

Combining the best design features with quality workmanship which ensures long life —a feature of all Frog motors.

"100 MK. II"
1c.c. DIESEL
53/4

A wide speed range and high performance is attainable with this easy-to-start motor. Ideal for beginner or expert. Develops .11 b.h.p. at 16,000 r.p.m. Bore .416 in. Stroke .460 in. Weight 2·9 oz. (Bare)

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1.49c.c. DIESEL
53/4

For that extra power the "150 R" has an outstanding performance in its class. Low fuel consumption with high power output makes it an ideal motor for ½A Team Racing, developing .15 b.h.p. at 15,000 r.p.m. Bore .500 in. Stroke .460 in. Weight 3 oz. (Bare).

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FROG

All motors give a better performance when fitted with a Frog Nylon airscrew. This is a wide range to suit all motors.

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LINES BROS. GROUP

TAPLIN TWIN

BRITISH PATENT
No. 747742

BRITISH RADIO CONTROL WORLD RECORD aspirants should be encouraged by Birchington Engineering's magnificent cash prize offer of £75 to the first such record duly promulgated, flying with a TAPLIN TWIN, of course. December, 1959, *Aeromodeller* contained details of the offer, or we will gladly send them to you on request.

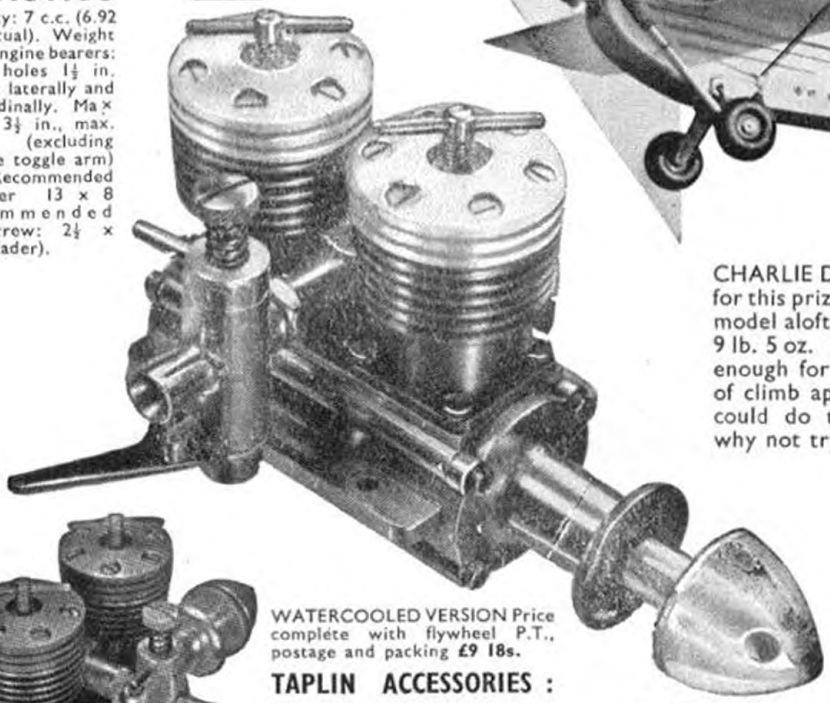
£75 FOR YOU ?

RECORD ASPIRANT !

CHARLIE DANCE of North Kent Nomads is busy training for this prize and here you see his TAPLIN TWIN powered model aloft at Manston. Span is 8 ft. 6 in., unladen weight 9 lb. 5 oz. It will in addition carry up to 25 oz. of fuel — enough for a 2½-hours' flight. R.O.G. is brisk and rate of climb approximately 200/250 feet per minute. YOU could do the same with YOUR T/T powered model, why not try?

VITAL STATISTICS

Capacity: 7 c.c. (6.92 c.c. actual). Weight 15 oz. Engine bearers: Fixing holes 1½ in. centres laterally and longitudinally. Max height 3½ in., max. width (excluding throttle toggle arm) 2⅜ in. Recommended propeller 13 x 8 Recommended waterscrew: 2½ x 2½ (2 blader).



WATERCOOLED VERSION Price complete with flywheel P.T., postage and packing **£9 18s.**

Three bearing crank shaft

£8.12
Inc. P.T., POST & PKG.

TAPLIN ACCESSORIES :

TAPLIN 2½ x 2½ Stainless steel waterscrew, specially developed for the T.T. Price, inc. P.T. **9/6d.**

TAPLIN Silencer, nickel plated Burgess type, Price inc. P.T. **4/9d.**

TAPLIN 100 c.c. TANK Nickel plated, Terry fixing clips, screw-down plastic filler cap Price inc. P.T. **4/9d.**

THE TAPLIN 7 c.c. TWIN is not "just another engine", it is the culmination of a lifetime's experience by a PRACTICAL modeller. With all the flexibility of a good petrol engine without the disadvantage of electrics it has enjoyed an enthusiastic reception from modellers all over the world from the word go. Our engine department is always busy, but we can still supply you right away, backed with our complete satisfaction or money back guarantee, so that you can remit with confidence wherever you may be.

This is the watercooled TAPLIN TWIN supplied complete as illustrated.

Birchington Engineering Co. Ltd.,

BIRCHINGTON, KENT **Tel.: THANET 41265/6**

Please send me a TAPLIN TWIN ***(Aero : Watercooled)***. (Delete type NOT required.)
* TAPLIN Waterscrew, TAPLIN Silencer, TAPLIN Tank.

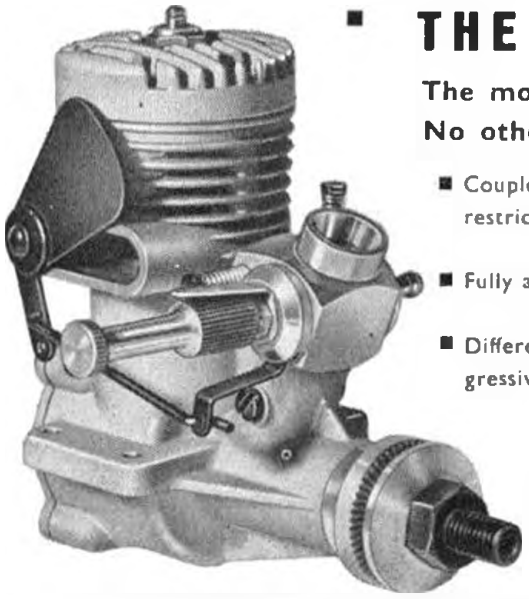
I enclose cheque/money order value.....

NAME.....

ADDRESS.....

* For orders of under **£1** please include **1s.** part cost of postage & packing

THE SENSATIONAL NEW MERCO MULTISPEED 35 & 29!



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The most advanced specification yet seen.
No other motor has all these features.

- Coupled barrel throttle and exhaust restrictor.
- Fully adjustable throttle stop.
- Differential action for more progressive speed control.
- Adjustable air bleed for positive tick-over in all climatic conditions.
- Falter-free pick up from idling to full power.
- Smooth, controllable speed range 12,000-2,000 r.p.m.

PRICE £7. 12. 6. inc. P.T.

After many months of development, MERCO are proud to announce this engineering masterpiece. Designed by engine ace Ron Checksfield and tested by National R/C Champion Stewart Uwins.

★ *The* ***MERCO*** *Multispeed engines are at your local dealer* ***NOW !***

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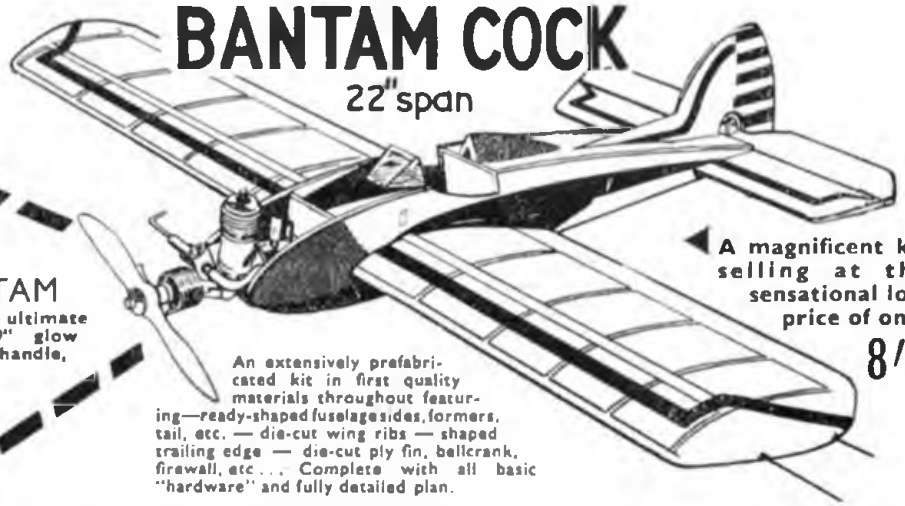
22" span

Developed to give a REAL flying performance on 20-30 ft. lines on small motors. Featuring 15% symmetrical wing, rugged beam mounts for engine, sheet fuselage construction and built-up wing.

DESIGNED FOR
THE D.C. BANTAM
Design-engineered to give the ultimate in performance with ".049" glow motors. A model which is a thrill to handle, and easy to build, too.



A magnificent kit selling at the sensational low price of only 8/11

An extensively prefabricated kit in first quality materials throughout featuring—ready-shaped fuselage sides, formers, tail, etc. — die-cut wing ribs — shaped trailing edge — die-cut ply fin, bellcrank, firewall, etc . . . Complete with all basic "hardware" and fully detailed plan.

Like all YEOMAN kits, full of ORIGINAL design ideas — the finest quality kits on the market today. See the complete range at your local model shop

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The D-C "Bantam" is a perfect match for this model — easy starting and plenty of power for aerobatics.

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- Multi-Channel Operation for Beginners by Lieut.-Col. H. J. Taplin.
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52 pages 8½ x 5½ in. containing a wealth of information for radio control enthusiasts of all degrees of expertness.

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On sale April 9th, 1960, wherever you buy your **Aeromodeller** *or* **Model Maker.** *Your stockist will be happy to obtain a copy for you. Or by post direct from the publishers, price* **2/4** *including postage.*

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BRITAINS FINEST FLYING MODELS

AS ALWAYS - *PROGRESSIVE - PRACTICAL - PERFECTION*

A real man's model for stunt and combat flying. A fast rugged ship for motors of 0.29 to 0.35 cu. in. capacity. All balsa and ply parts die-cut or pre-shaped for ease of construction. Fully airfoiled wing for outstanding aerodynamic performance. Pre-shaped landing gear. Coloured wing transfer.

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MERCURY **Cobra**

MERCO 29 and 35

The special qualities of these motors which have been specially developed to fly all the stunt patterns without loss of power, show up at their best when fitted to the COBRA. The combination of COBRA and Merco makes a model that will give you the thrill of a flying lifetime.

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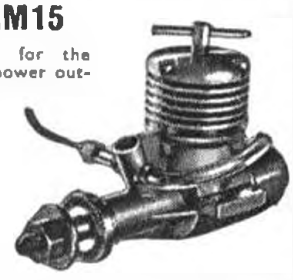
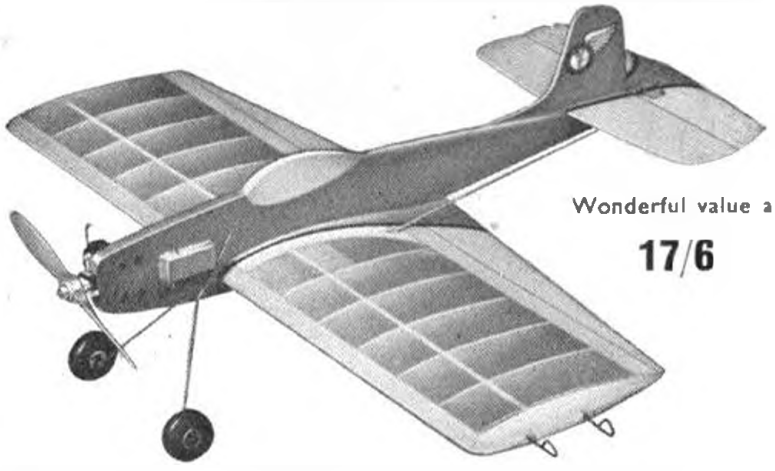
MERCURY **VIPER**

AM10 and AM15

Specially recommended for the VIPER where the high power output and free-revving capabilities of these two motors show to the best advantage.



AM 10 56/8
AM 15 57/10



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Simple construction profile fuselage stunt and combat trainer model for diesels 1—1.5 ccs. All balsa parts die-cut or pre-shaped. Built up airfoil wing for aerobatic performance. Pre-shaped landing gear. Three colour attractive wing transfer.

and NOW !

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With its inherent ease of handling and non-critical control, the MERCO engine is a natural for conversion to Multi-speed operation. The dual throttle and exhaust unit developed by Ron Checksfield, is without doubt the most advanced R C control unit of its type today. There is full range of control from 2,000 to 12,000 R.P.M. and the airbleed valve fitted to the throttle unit, enables the optimum running conditions to be achieved at low R.P.M. without any loss of performance at the top end of the output curve. The best R/C engine there is at

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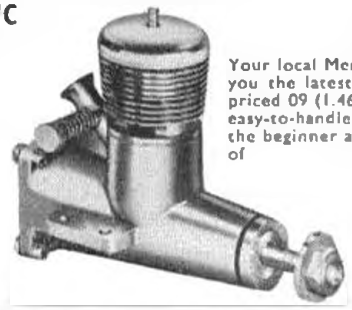

Your local Mercury Dealer can still show you the latest FOX engine, the popular priced 09 (1.46 ccs.). This is a tough and easy-to-handle glow motor, suitable for the beginner at the remarkable low price of

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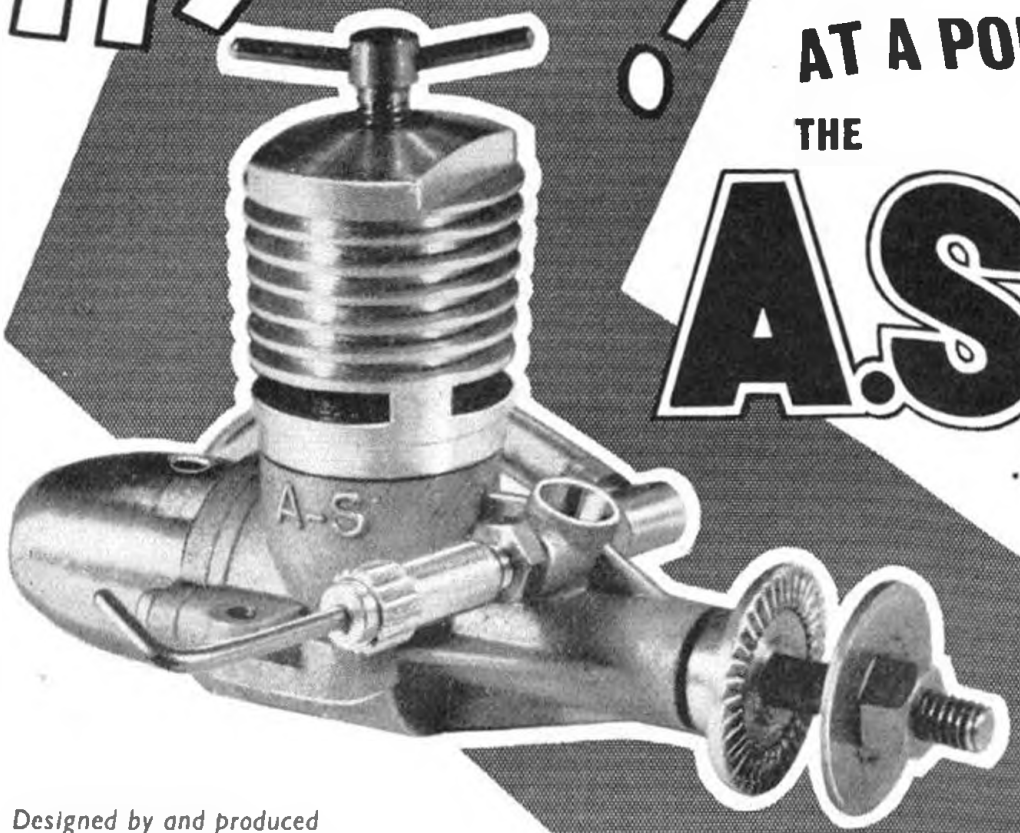


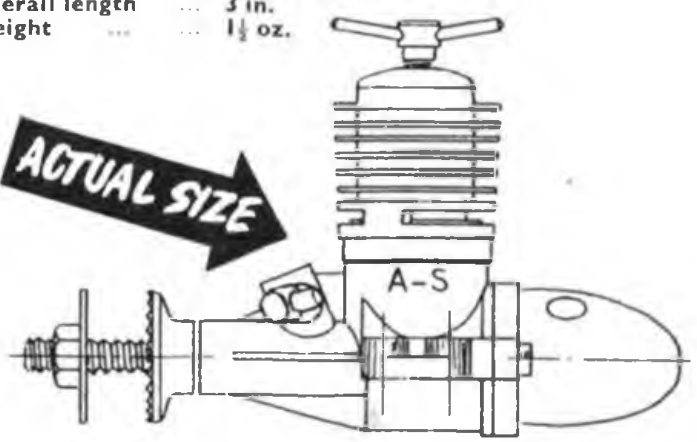
55/6 INC. TAX

Designed by and produced under the personal supervision of **Alan Allbon,** *whose 15 years experience in the design and manufacture of model engines has produced this brilliant engine*

Easy starting Ideal for Beginners!

Bore	.350 in.
Stroke	.350 in.
Overall width ...	1⅛ in.
Overall length ...	3 in.
Weight	1½ oz.

ACTUAL SIZE



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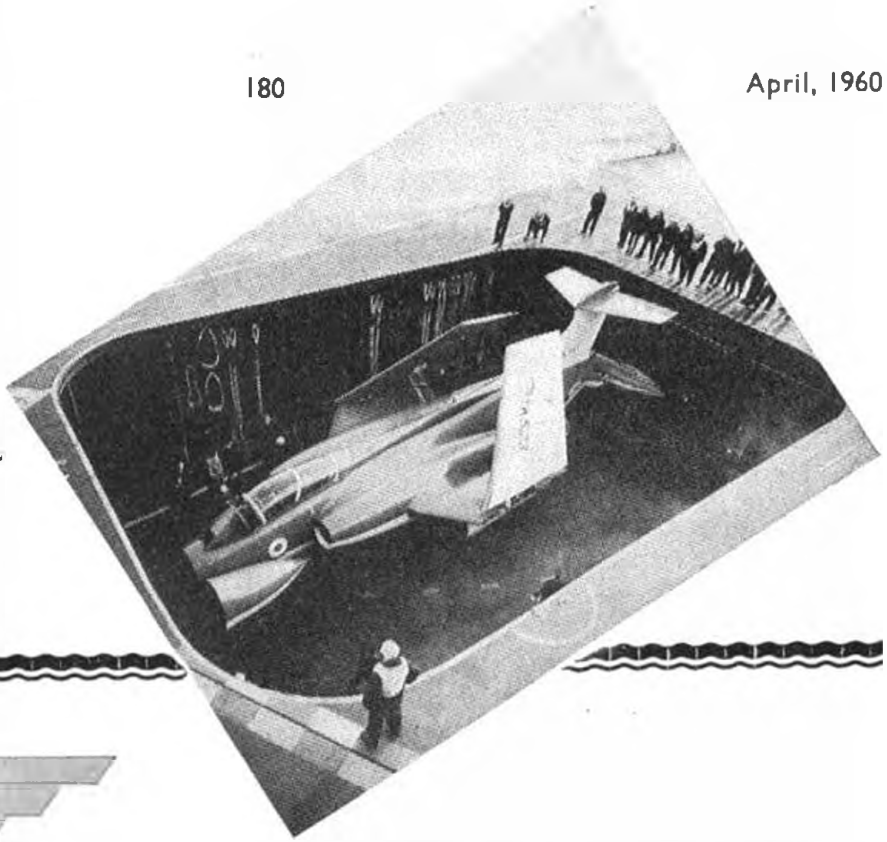

AERO MODELLER

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VOLUME XXV

No. 291 APRIL 1960

CONTENTS

On the Cover

A flight of Hurricanes scramble up from R.A.F. Biggin Hill during the Battle of Britain. Artist Ken McDonough has chosen the unusually marked GZ lettering of 32 Squadron for his dynamic painting.

AEROMODELLER Incorporates the MODEL AEROPLANE CONSTRUCTOR and is published monthly on the 15th of the previous month by the Proprietors:
MODEL AERONAUTICAL PRESS LIMITED.
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Explanation for campers

SINCE publication of the S.M.A.E. change of policy in our January issue regarding arrangements for camping at the Nationals, we have been inundated with correspondence which quite clearly illustrates that the great majority of aeromodellers simply do not understand the reasons for the Society's decision. Even those known by us to be offenders in the scattering of litter seem to be unaware that they have embarrassed the Society in making its task so very difficult for 1960 and future years. In order to present the official view on this serious subject, we invited the S.M.A.E., through its Public Relations Officer, Ken Brookes, to issue the explanation which follows.

"One of the most popular topics at the moment is the highly controversial subject of 'Camping at the Nats.' "The SMAE have banned camping" is the cry: "Why don't they do more for the aeromodellers?" and so on. One might almost imagine the "SMAE"—some rarified and distant body of senile and decrepit old men—meeting regularly to plot ways and means of doing down the "aeromodellers"—fine and upright citizens to a man.

"Let us think for a moment.

"Ever since the Nationals began, there has been a camping site at the Nats. Ever since the Nationals began, there has been trouble with campers. Fine aerodromes obtained after months of negotiation have been lost by the maliciousness of a few, and the negligence and carelessness of the many. Chief among the "crimes" is the scattering of litter, but there have been cases of damage to property on almost every occasion, which in at least one instance might have endangered aircraft.

"Whilst the R.A.F.—to whom our thanks go out for their indulgence—may be prepared to tolerate, even to welcome, model flying enthusiasts, aeromodellers are, on the whole, one of life's minor nuisances to the farming community. Having grown men (?) trampling across growing crops, in search of their model aeroplanes is bad enough, but to have a thousand or two actually camping in a ten-acre meadow . . . . !

"After the campers departed from Scampton last year, a three-ton lorry removed *two* complete loads of litter. Among the refuse were two sleeping bags, bottles and tins by the gross, and some hundreds of yards of control line wire. We wonder how many aeromodellers have ever seen a sheep with its legs tightly entangled in high-tensile steel wire—or raked a field for

the tenth time to ensure that no wire is left? How many aeromodellers would let animals into a field where glass bottles had been trodden underfoot at almost every pace? What compensation would they find sufficient—or would they rather not take the chance?

"Let it not be said, however, that the 'SMAE is anti-camping:' for, in truth, the SMAE is very largely composed of campers. The governing Council of the SMAE is no independent body, making its own—unpopular—decisions: it comprises a minority of democratically-elected Officers and a majority of Area Delegates, any of whom could be replaced at any time should they cease to carry out the instructions of their Area. And *every* full member of the SMAE has direct representation, through his Area, to the Council. The Council is fully aware of the importance of a camping site or sites at the Nationals, and it will not be due to lack of effort if there is none, it will simply mean that none was available.

"IF a camping site is obtained, however, it will necessarily be under much stricter discipline and supervision at National, Area or even club level—or all three—to ensure that NO litter of a dangerous nature (wire, glass, tins etc.) is left on the field, and that as little litter as possible of ANY kind is left. It will *not* be an excuse (and it never has been) to say that insufficient litter receptacles were available. A tin can does not expand when emptied, and an empty bottle occupies no more space than a full one; if you found room to bring it, you have room to take it away again.

"Great difficulty is being experienced in obtaining a camping site for this year and, as this is written, one has not been secured; *but the effort is being made*. Should one be found, it will undoubtedly be the last chance to reform. But it may well be that 1959 *was* the last chance."

K. J. A. BROOKES
PRO, SMAE LTD.

We trust that this Official explanation of the true situation will be carefully considered by our many, apparently incensed, correspondents. They may care to interpret that, far from the SMAE banning camping, the case is in fact one of the modellers banning camping facilities for themselves, and they should be grateful that their Society is trying so hard to retrieve the situation.

Sign of the Times

Most unusual Hangar Doors we have ever illustrated, is in the heading for this regular feature. This view is of Blackburn's NA.39 disappearing down the hangar lift on H.M.S. *Victorious* during the initial deck-landing trials. Now that carrier-borne jet aircraft are becoming faster, heavier, and larger, they also have to adapt themselves ingeniously to fit into the confines of ship-board hangars. In the case of the NA.39 it is a matter of swinging the nose *and* the tail brakes as well as the outer wing panels.

Polkabilities

We conveyed our congratulations to Nat and Irwin Polk in "World News" last month on the occasion of their anniversary in the Model and Hobby trade and in the photograph (*at right*) we see the notable brothers about to chip some discount off their appropriately-decorated cake. Nat Polk (at left) has just accepted chairmanship of the fund-raising programme to send State champions to the 1960 American National Championships at Dallas, in Texas, during July. Last year Nat and his committee successfully organised an Air Youth programme which enabled fifty modellers to be flown to California to represent each of the United States. Travel funds are donated by member firms of the model and hobby industry and a tremendous amount of work is required from dedicated folk like the Polk brothers to raise as much as $21,500. This is the figure required to transport the Champions from each of the States to Texas in July. The fortunate modellers will have to be under 21 years of age and will qualify through youth-sanctioned contests. Once declared as a winner, the Champion will get a special outfit to wear and identify himself at the Nationals.

At right, Nathan and Irwin Polk cut the special cake presented to them by their New York staff on the occasion of their 25th Anniversary in the model business

Fine Russian Film

An interesting ceremony took place at the Russian Embassy on February 3rd 1960, when an exchange of aviation films was made between the Aero Clubs of the U.S.S.R. and Great Britain. On behalf of the Royal Aero Club and its members, Lord Brabazon of Tara handed copies of the Shell films "High Speed Flight" to the Russian chargé d'affaires, following which the exchange film "Sporting Aviation in the U.S.S.R." was screened.

This film of a highly organised public display at Moscow is a masterpiece of air photography, in colour, and depicts scenes of every aspect of spectacular flying with the (unfortunate) exception of aeromodelling. Col. Preston drew attention to the part that modelling plays in the Russian approach to aviation for the masses, and it was disappointing to find no reference to our hobby in the film.

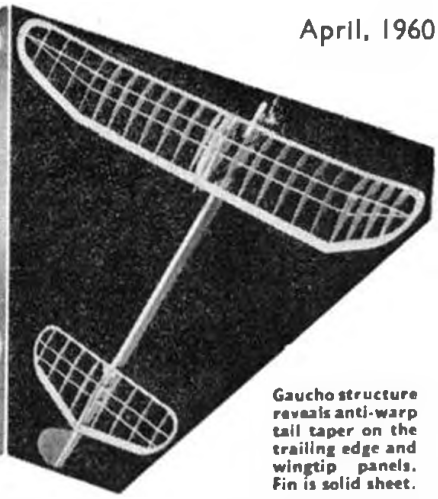
As we go to press, we have no knowledge of future arrangements for screening this remarkable film, but we have no doubt that interested modellers will have the opportunity in due course of seeing this record of organised aerobatics through their local flying clubs. Presumably English sub-titles will have to be dubbed in before general release.

Pioneer Passes

It is with regret that we record the death of George Court, for so many years an ardent aeromodeller in North Kent, and of course a pioneer designer of miniature petrol and diesel engines. George was responsible for the Frog 175 and the subsequent 100 diesel among many other inventions of the immediate post-war years. He died on Monday, February 8th aged 61 years and our sympathies are extended to his wife and married son.

Trade Notes

KeilKraft's 44 in. Gaucho, finished in blue and white, with D.C. Sabre 1.5 c.c. diesel, is a good practical contest design



Gaucho structure reveals anti-warp tail taper on the trailing edge and wingtip panels. Fin is solid sheet.

REPRINTS of the very popular **Harleyford Publications'** books "Air Aces of the 1914-18 War" and "Von Richthofen and the Flying Circus" are now avilable at 45s. each. We have had the opportunity of studying copies of the new editions which are distinguished by their very fine full colour reproductions of J. D. Carrick's W.W. I paintings on the dust jacket. The same painting is also reproduced on the art paper frontispiece. Careful attention to additional information and corrections sent to the publishers following issue of the original impression, has enabled Harleyford to correct earlier errors, and we are especially pleased to see revised scale drawings in the Von Richthofen work. Internationally accepted as the finest publications on their subjects, these two books are indispensable to the ardent enthusiast of vintage aircraft, and we fancy that many purchasers of the first print will be seeking these new copies to make sure they have the very best available.

There is no denying that plastics are big business. Particular evidence of this came to us on the opening day of the Brighton Toy Fair, February 18th when Mr. Ehrmann, Managing Director of **Airfix Products** flew back from his four-week sales tour of South Africa for a few hours of the Brighton show, before departing once more for the U.S.A. It is good to know that British plastics are indeed holding their own in overseas markets, and this is also very true in the case of **Rosebud Kitmaster** who have firmly established their HO gauge railway kits in America. The new Kitmaster catalogue is an impressive parade of current models and future additions to their range including illustrations of locomotives for projected production as far ahead as November of this year. Already Kitmaster are issuing their first Corridor Coaches and although we realise this is strictly a non-aeromodelling item we do know that a very high proportion of our readers have equal interest in model railways and will appreciate the very fine value for money, price for the Corridor Coaches being only 6s. 6d. each.

Motorising kits for these plastic models are already available, but Kitmaster will be introducing their special electric Box Wagon in July, together with coach electric motor bogies with a 3-pole motor and worm driven double axles, the price to be 27s. 6d. for the motorised bogie and 35s. for the complete Box Wagon.

Ripmax have sent us samples of the first Semo nylon propellers which they are distributing in this country, sizes being 7 x 8, 3s. 6d., 8 x 6, 8 x 8, 3s. 9d., 9 x 4, 4s 1d. Among those to come will be a 10 x 4 with special appeal for radio controllers.

Top Left: the new nylon props distributed by Ripmax are neatly packaged and have tip flexibility. Below are the new Davies-Charlton fuel packs, the new mixtures are indeed potent and finely filtered. Makers have gone to a lot of trouble in finding best constituents in their formulae. In foreground is the Polystyrene 5½ x 3½ prop. for the Bantam which sells at 1s. 6d.

Another line to be distributed by Ripmax will be the Radio Control kits for the *Vagabond* and *Viking*. These models have already been extensively photographed by us in reports on the last two "King of the Belgians" European radio control championships. We have already commented on the very high standard of kitting in the Vagabond marketed in Sweden by Sven Trudson in fact, we rate it one of the finest examples of die-cutting and kit preparation to be found anywhere. This is a high wing 60 in. design for 2·5 - 3·5 c.c. whilst the Viking is a fascinating, low winger by Bergelund for a side-mounted 2·5 c.c.

Fuselages moulded in glass fibre have the special quality of being virtually indestructible. **W. P. Holland** is able to offer a nicely-shaped fuselage for radio control or sport flying, 36 inches long, split along the centreline, weighing 12-13 oz., for 45s. A further 10s. is required as a deposit on the crate in which the fuselage is despatched. In answer to popular demand Peter is also producing an 18 inch fuselage with applecheek engine cowls incorporated weight 3½-oz., and this should be very suitable for small stunt models, even team racers or free-flight at 15s. A further line are the spats which weigh 3½-oz. per pair at 7s. 6d. per pair, all can be seen in the photographs on this page, also a cheap, but quite efficient rev. indicator with an adjustable wire reed to indicate approximate r.p.m. Glass fibre mouldings are finished with an orange dye and require a little extra work in cleaning up for wing and tail seats, etc.

First **KeilKraft** free-flight power duration design since introduction of the ever-popular *Slicker* series and *Skylon* comes from the drawing board of International contest flyer Neville Willis. The simple lines of the design with all-sheet fuselage

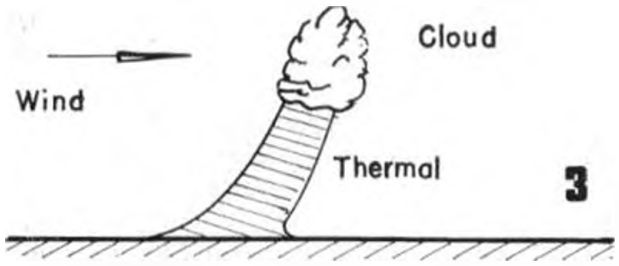
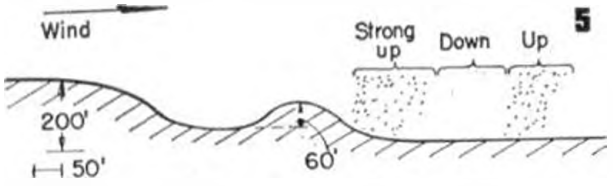
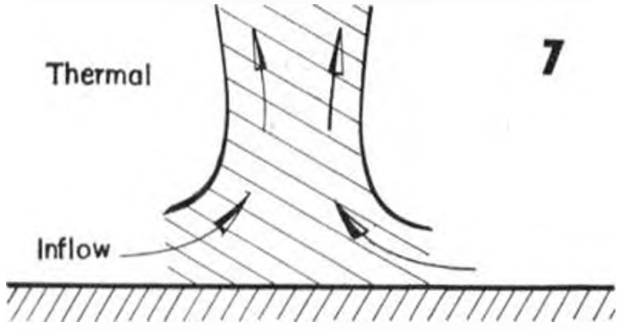


Fig. 4, about three-quarters of a mile in diameter, has often provided a stationary region created by a certain wind direction, with sufficient updraught to give an extra thirty seconds duration to a flight.

This situation has remained unchanged for several hours. These updraughts are of course, not pure thermals, as has been deduced by their existence after sunset. With another wind direction at the writer's flying field an interesting occurrence was experienced, but producing inferior flights. Model was launched and the well-known "up", "down", then strong and steady "up" were felt

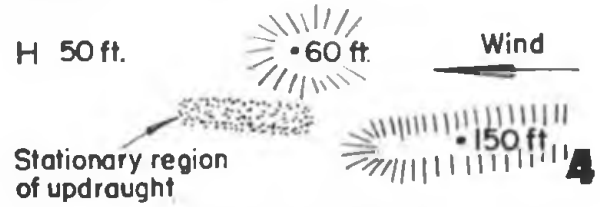


on the line always at the same point on the field. After release, the model completed two minutes glide. On one day the two minute flight was repeated 20 times. These flights took place behind a fairly shallow hill, *Fig.* 5, with a small ridge, behind this. It is not yet known if waves can be expected on so small a scale, though the previous observations suggest that waves existed. Individual experience of wave flying will probably end in disappointment, as the model will drift through the stationary upcurrent. Also on the line, waves will tempt you to release at the wrong moment, as happened with the writer's last mentioned flights.



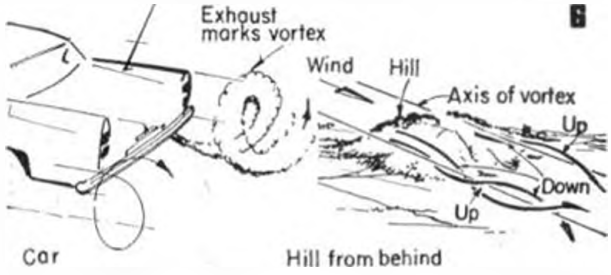
The extra thirty seconds achieved on the first flight example were probably due to standing vortices. An example of these can be seen around the exhaust pipe of a moving car, *Fig.* 6. From these observations, it seems logical that a similar phenomena could occur behind a hill that is subject to moving air. As these vortices lie apparently in the wind direction, and are fairly long, they can be used to advantage.

Having decided on what part of the flying field conditions appear most suitable, one still has the problem of *when* to launch. *Fig.* 7 illustrates how, in a typical thermal, air is drawn to the centre, on the lowest level. If the thermal is moving towards the flier, this inflow appears to reduce the wind speed. At the moment the thermal is directly above, wind speed increases higher than normal, then gradually decreasing. So it would seem that the first puffs after a period of fairly calm air are the signal to start towing. In practice there are many velocity fluctuations in the air, even without thermals, so that it is difficult to detect the real thermal especially in high wind with weak thermals. However, the Finns demonstrated at Bourg-Leopold that one can increase chances of finding a thermal quite substantially by this method.



In a contest the flight of the person before you can help considerably, the singing of his line, dihedral of his wings, and running speed can mark a thermal. In strong winds you cannot afford to wait until his model has climbed, otherwise you will be too late. Other points to watch for are birds, particularly swallows, for even they make use of thermals.

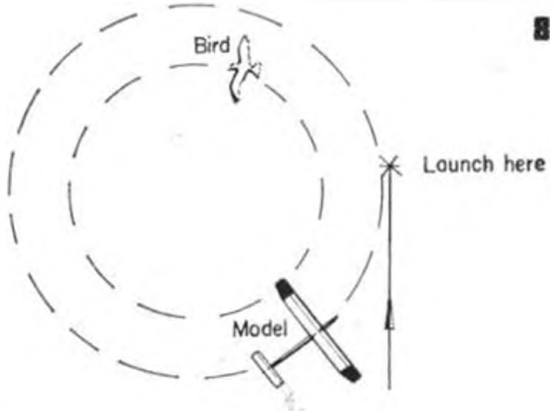
Now knowing the time and place to fly, one still has the actual launch to perform. A pull on the line is always felt when the model is about 60 degrees above horizontal.



Usually this is not a thermal. Then one feels a further pull and the model starts climbing overhead. It is best to wait four to five seconds, or the model will immediately return to the downdraught you probably towed through. Never lose hope though; the big thermal is always behind the big downdraught.

Observing all these rules, etc., it is still easy to release, the model for a poor flight. One may see a circling bird which has obviously found a thermal. The model should be launched to fly just outside the bird's circle *Fig.* 8. An example of how easy it is to forget this rule was given at Bourg-Leopold last year, when a perfect score was spoilt by one person. This is so easy, simply because

(Continued on page 185)



A 38½" sportster for up to 1c.c. from faraway Pakistan . . . by SAFDAR QURESHI

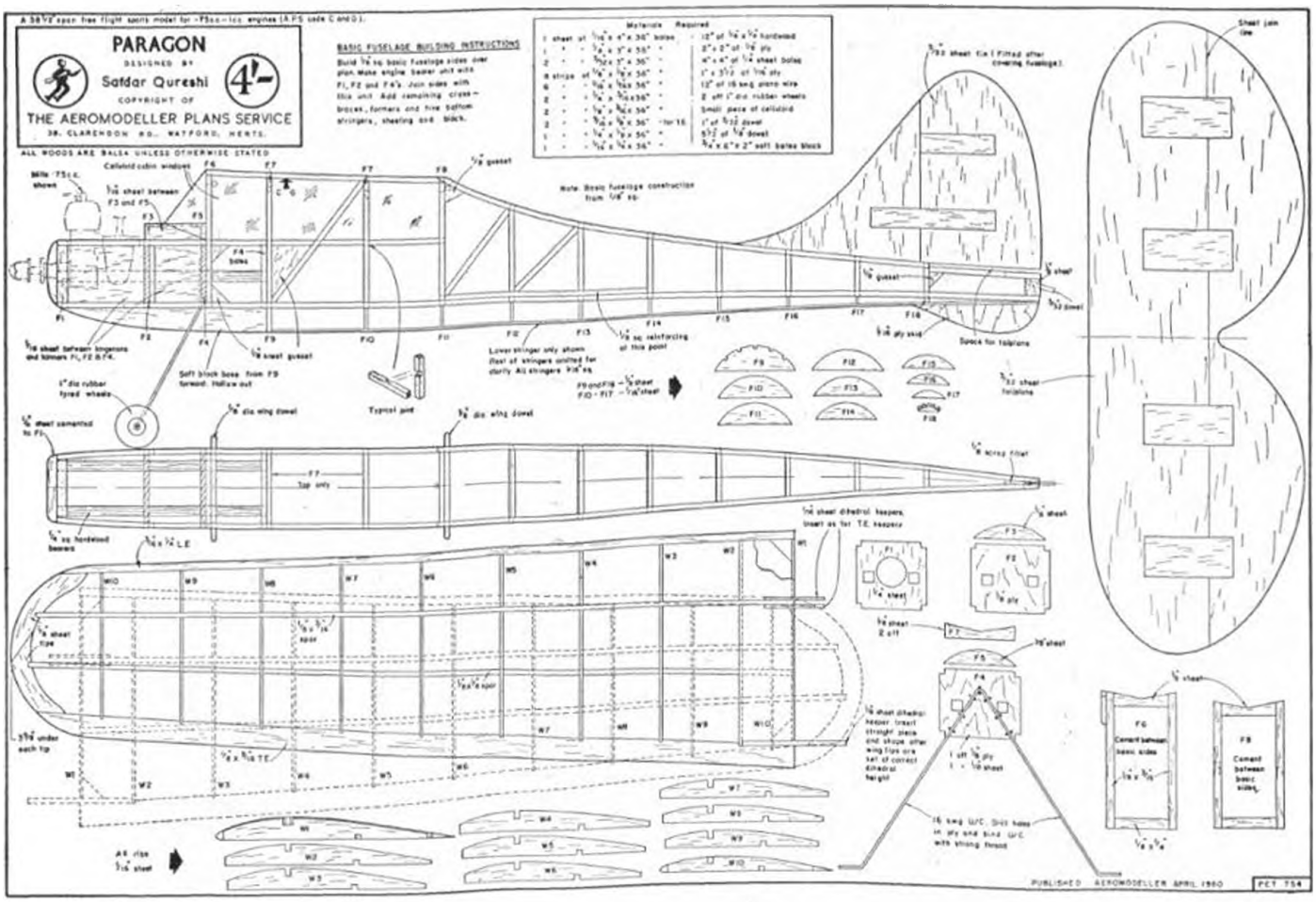
ALTHOUGH to many eyes the general appearance of this model will be a reminder of early sports power model designs, *Paragon* is a good example of the typical high wing cabin layout with simple construction making it ideal for beginners.

It is also our first design to be incorporated in AEROMODELLER Plans Service from Asia and we hope it will inspire our many other readers in Eastern countries to give us the opportunity of publicising their designs.

Youthful Safdar Qureshi is a Pakistani student at present in college at Rawalpindi, and he has been flying this 40 in. model with a Mills ·75 c.c. diesel with great consistency.

His Paragon will also suit the new ·8 c.c. glow plug engines and although we did not include the engine capacity in our specification, the AS-55 is so exceptional a "point-five", it too would suit admirably. For the beginner construction is both simple and inexpensive.

FULL SIZE COPIES OF THIS 1/5TH SCALE REPRODUCTION ARE AVAILABLE AS PLAN PET 754 PRICE 4/- PLUS 6d. POST FROM AEROMODELLER PLANS SERVICE



The fuselage is made by pinning down the basic ¼ in. square balsa side frames over the plan and subsequently joining these with the engine mounting unit consisting of the formers attached to the engine bearers. Once the sides are aligned on the bearer unit additional spacers can be added, working towards the tail end *after* joining the extreme ends of longerons, and then adding to the auxiliary formers, stringers, and nose blocks.

The design calls for ½-lap joints for the interim longeron along the cabin window shelf which also supports the centre fuselage structure.

These points are not critical, that is to say they do not demand a high grade of "carpentry", but the builder must make sure that they are secured well with ample cement. After the undercarriage has been fitted and sections of sheeting, the wing and tail retaining dowels, cabin celluloid and tail skid have been fitted, one can turn to the tail surfaces.

Although the prototype uses a built up structure of ¼ in. x 3/16 in. we recommend soft sheet surfaces with internal braces let into the sheet to obtain a relatively warp-free unit. Be careful to apply equal coats of dope, preferably immediately after one another on each side of both the tailplane and fin to prevent the dope from curling the wood. Application of lightweight tissue will not only provide colour decoration, but it will also prevent too much dope soakage and will give added protection.

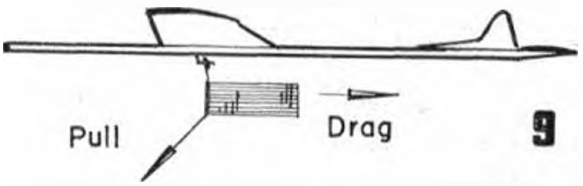
Wing panels are made in two halves and joined with dihedral braces at the centre section. Since these wings have a flat bottom airfoil they can be built directly over the plan pinning the trailing edges and leading edges in position together with the lower spar adding the ribs and tips, then finally the upper spar; but leave the cementing of rib W1 until the dihedral joint has been made. The best way to do this is to keep one wing panel flat on the building board and block up the opposite wingtip 7½ in. whilst the centre joints are being made and rib W1 added together with the 8-sheet gussets.

"I'm beginning to like this hobby: but for the hardest part—all those tiny parallel lines on AEROMODELLER Scale plans!"

All that remains is to cover the wing and fuselage, applying at least two coats of clear dope and extra colour decoration as desired. The fin is firmly cemented on top of the fuselage with special attention paid to its lining up with the centre line. The fin is quite large and if it is positioned out of true it will give too tight a natural turn. The tailplane can in fact be fixed on for transport purposes, it is preferable to be detachable, sliding into the slot under the fin, and retained by elastic bands, all the trimming being effected by alteration to the wing angle.

In actual fact if your Paragon balances at the point indicated and the engine is in the advised power range i.e. less than 1 c.c., Paragon should fly "off the board" without the need for any fussy field trimming. As we have said before, it is a design to the classic sport formula with ample tail surface, moderate power and ideally suitable for beginners.

Thermal Hunting (*Continued from page 183*)



once one is running *and* towing, there is no time to stop and think! Therefore the reserve model should always turn in the same direction as the one usually flown.

When does one have enough pull on the line to hope for a max.? People have been seen running for some distances looking for thermals, on a cold day, when strong thermals simply were not there. It is best not to be afraid of launching the model in a slight thermal. The writer dislikes strong thermals because of the greater chance of the model being pushed out. Also, downdraughts in the vicinity of such thermals, are similarly strong, so that one may end up with a flight of only 60 seconds duration. This is especially true with thermals forming over a runway, where, one will remember, they can be quite strong. Remember also, that every model is gradually pushed out of a thermal, as the wing that is nearer the centre always obtains more lift. Every sailplane pilot will confirm this.

Further suggestions for getting the most from a model are, firstly to do with actual towing. Train yourself by launching and paying out the line "solo" every time. Another point, in competitions one tends to forget about breathing when things become critical. This sounds ridiculous, but it does happen. Accustom oneself to breathing regularly when running, and towing range will be increased enormously (Gerry Ritz runs a mile a day to keep in training!). Next comes the winch, which, if heavy will not allow the pull of a model to be felt fully, so it is best in such cases to hold the line with one hand. The flag on the line is another point to watch. As the drag of the pennant helps release the model, *Fig.* 9, changing or excessive dampness of the material may produce an unexpected premature release. So we must angle the towhook *Fig.* 10. The writer finds that an upward bend of 20 degrees prevents pre-release if model should sink suddenly. The positioning of the hook has been amply dealt with in December AEROMODELLER, "Art of Towing" article by Canadian, Tam Thompson. To this, one must add the need for wings that flex *equally* under towing conditions.

Addition of a clockwork timer to the model is certainly worth the trouble. In a comp. the model can be launched any time without having to light a fuse. One just waits with the model on the line until the right thermal comes along, the timing of three minutes starting from the moment of launching—as simple as that!

MICROFILM COVERED
(13 entries)

1. Parker, G.	...	Tees Side	10:02
2. O'Donnell, J.	...	Whitefield	8:11
3. Grimmett, M.	...	West Bromwich	7:46
4. Chambers, T.	...	Tees Side	6:54
5. Robson, A. M.	...	Tees Side	5:54
6. Barnacle, E.	...	Leamington	5:53

TISSUE COVERED
(13 entries)

1. Parham, R.	...	C'Member	8:08
2. Jukes, B.	...	Birmingham	7:58
3. Barnacle, E.	...	Leamington	7:35
4. Robson, A. M.	...	Tees Side	5:45
5. Roberts, L.	...	Bolton	5:20
6. Greaves, D.	...	Leamington	5:04

CHUCK GLIDER
(33 entries)

1. Ellison, J. T.	...	Whitefield	0:38
2. O'Donnell, H.	...	do.	0:37
3. Freeston, G.	...	Sheffield	0:30
Birks, J.	...	Chorlton	
5. Greaves, D.	...	Leamington	0:29
Turner, M.	...	Cheadle	

reported by "RUSHY"

JUST ABOUT EVERYTHING conspired to upset the plans of the North Western Area S.M.A.E. for the staging of their annual indoor soiree at the Corn Exchange, Manchester. Undoubtedly the imminence of the threatened rail strike affected attendance, on top of which the weather could not have been more unhelpful. Many stalwarts detoured and skirted the snow-blocked areas, but the widespread snow must have deterred a number from their promised trip.

Nevertheless, a goodly crowd witnessed some remarkably good flying under chilly conditions, predominantly with old machines that have bashed their way around the dome and girders of the Exchange in past years. Since the loss of Cardington some years ago, indoor enthusiasts have had little to encourage them into building newer and better models, for after all, how many modellers care to put much effort into a once-a-year meeting with their fellows?

Fortunately, the writer has been able to negotiate with the authorities for the resumption of activities within the huge balloon shed in Bedfordshire, and 1960 should see an increase in interest in this fascinating type of aeromodelling with its especial skills and requirements, and it is perhaps not too much to anticipate meetings of International status in the not-too-distant future.*

Proceedings at Manchester opened as usual on the afternoon of Saturday, February 13th, with practice flying, but conditions were far from ideal in the unheated hall, and unwelcome draughts came at crucial moments to spoil otherwise fine flights. All the well-known ultra-light "bods" were there in force plus a few new faces, having travelled from as far afield as Birmingham, Teeside, Lincoln, Sheffield, York and places in between. Pity that the Northern Heights club dinner was fixed for the same week-end, or we might have seen some of the better-known London microfilm chasers!

Following a cold train journey, the bitter interior of the Exchange caused your reporter to "turn chicken" fairly early in the evening in favour of the central heating of a hotel, where preparations were made for a full session on the Sunday.

Bright and early the hall was full of competitors and spectators, and Area Chairman Frank Nixon and family were kept busy collecting door money, whilst the entry lists gradually crept higher up to the magic level of Gold Badge qualification (ten or more entries for the ignorant!). A few tentative test flights soon showed that conditions were much improved on the night before, and what drift there was was soon detected and put to useful purpose in maintaining a central flying region.

Flying sessions were listed, giving the microfilm and tissue devotees due warning of the chuck glider onslaughts, the furious activity of the "strong-arm" boys contrasting vividly with the slow, deliberate methods of the rubber-powered classes. Many and varied were the types of solid glider seen, ranging from the super skilled to the utterly ridiculous, locals Terry Ellison and Hugh O'Donnell of Whitefield being outstanding in their excellence of performance and consistency. Throughout the day first one then the other would get his nose just in front, until Ellison equalled his 1959 record to win the event with 38 sec., Hugh being one second behind. It was during a warming up session that Ellison set a remarkable new record of 45·5 sec., an increase of almost 20 per cent.

Outside these rip-roaring sessions, the microfilm and tissue covered jobs filled the air, though it soon became apparent as the day wore on that the best conditions prevailed during the morning. Reg Parham had his usual box full of varied models, and he set a fine time of 2½ min. plus with a new "double-flapper" ornithopter, beaten later in the day for a new unorthodox record of 3 : 10 with his underslung tailless model.

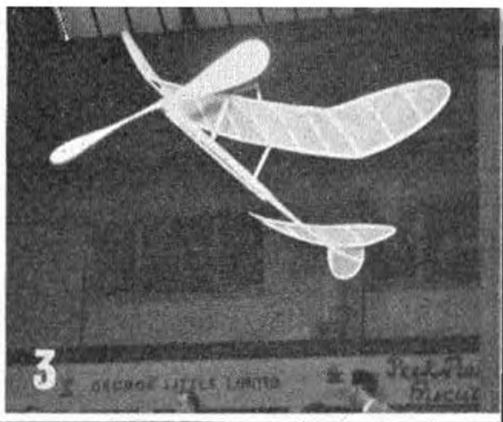
With equal entries in each class, there was not a great deal to choose between the types, as the results show. In a hall such as this, past results show that the heavier tissue-covered job can nearly equal the transparencies, and it remains to be seen whether in fact the margin widens in the roomier confines of Cardington. Top times changed on the leader board with regular frequency until finally G. Parker, one of the ever-present Tees-side contingent, chalked up best duration for the microfilm class with a fine 10 : 02.

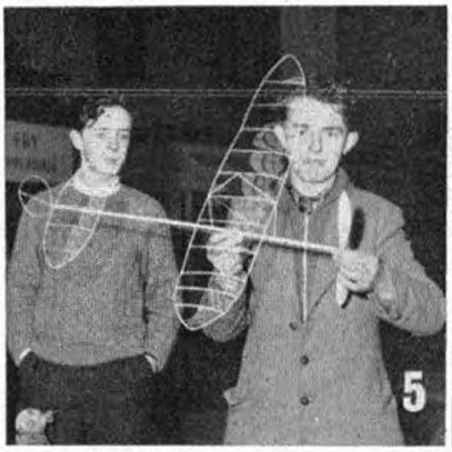
John O'Donnell (heard that name somewhere before!) placed second with 8 : 11, then came Mike Grimmett (West Brom.) with a 6 : 51 and best 7 : 46. This chap enlivened proceedings by sending up tiny balsa gliders on a hydrogen-filled balloon — biggest laugh coming when he bounced the ceiling with one, only to find that by some freak the glider stuck to the ceiling, where it remained for some time!

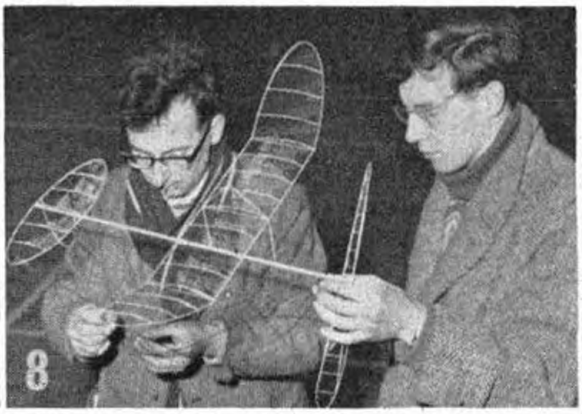
Honours in the tissue class went to the ubiquitous Parham, who — like many others — had many potential winning flights spoilt by wall bouncing. His top time of 8 : 08 was closely followed by "Bunny" Jukes' 7 : 58 and Eric Barnacle's 7 : 35, and in general the tissue times showed a more consistent pattern than the lighter models, though this is mainly accounted for in suspended (girders, etc.) and wall terminated efforts.

Full marks go to the N.W. Area for continuing to sponsor this annual get-together, and I trust we may look forward to many more pleasant sessions at the Manchester venue in the future. But please — can we have a little heat laid on? I'm sure the chaps would not mind subscribing towards this amenity, and after all, the Nixon-O'Donnell oil heaters could not make much impression on Jack Frost!

(First Cardington meeting is scheduled for May 7/8th. Only serious fliers are invited, and admittance will be restricted to those who have made application to the S.M.A.E. 19 Park Lane, London W.1 by no later than May 2nd. REMEMBER: No name on list, no entry to the Camp. Members must be prepared to show their S.M.A.E. Membership Cards to the R.A.F. Police at entrance).*





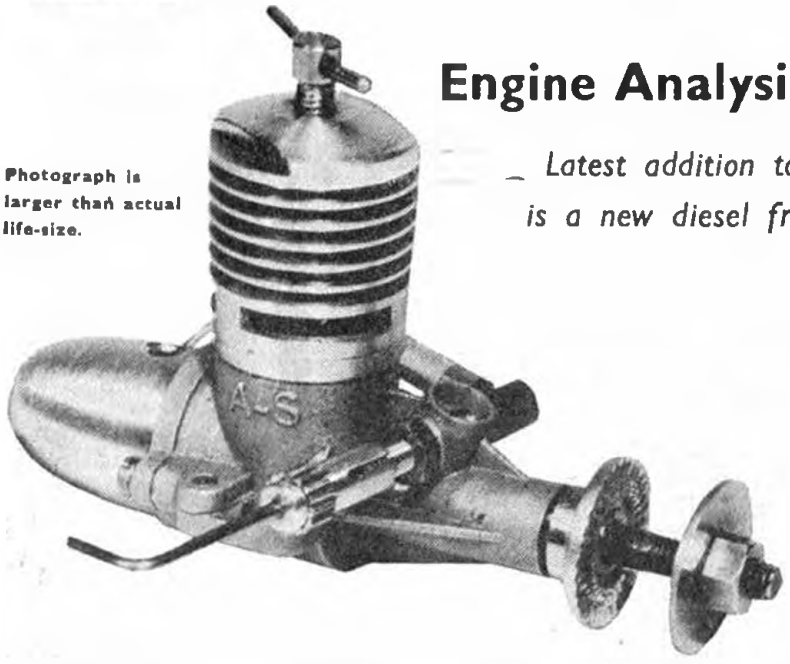


(1) Mike Grimmet, balloon and midgets put on their altitude chasing act. (2) The "strong-arm" gang were the only ones to get the chill out of their bones! (3) Don't know whose, but it's a good example of the average tissue-covered job flying at the Exchange. (4) Most interesting was the double-wing ornithopter designed by Reg. Parham, notable for the lack of the usual clack-clack noise in flight. Put in many fine flights. (5) One of the Midlands contingent with a beautifully-built microfilm. (6) Dan Poole and Ray Monks of Birmingham had a try-out with their large models, but decided they required more space. (7) Bunny Jukes with his excellently-constructed tissue-covered machine. (8) No meeting would be complete without the famous O'Donnell Brothers, here seen preparing John's mike job for flight. (9) 'Robbie' Robson of Tees-side did not appear to notice the cold. (10) Terry Ellison (Whitefield) again showed his supremacy in the chuck glider class. (11) Top microfilm man Parker of Tees-side (12) '59 Wakefield team member Lou Roberts had a great time getting from Lincoln. (13) J. O'D. launches with what appears to be a hearty heave, but the camera lies in this case.

Engine Analysis No. 70

by R. H. WARRING

Latest addition to the small engine range is a new diesel from a well-known designer



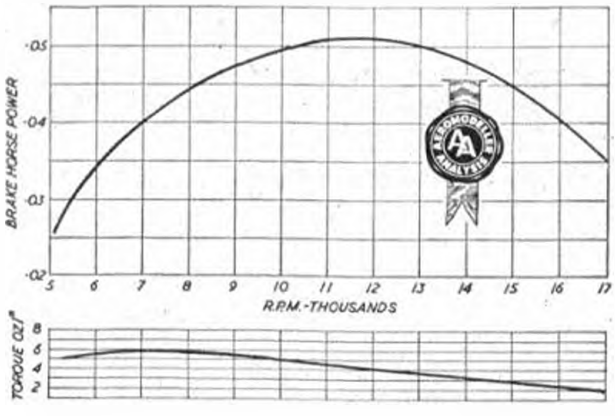
Photograph is larger than actual life-size.

A-S 55

As would be expected from any engine designed by Alan Allbon the A.S. "55" is an extremely neat, attractive and well made little power plant with a very good performance and handling qualities. Alan Allbon is one of the true pioneer manufacturers of diesels in this country and besides having all those years of "know how" behind him is one of the relatively few people in this country who are past masters of honing small bore cylinders to achieve optimum running fits.

The A.S. "55" does not represent anything radically new in design. It is, in fact, a perfectly conventional small diesel which "borrows" several Allbon features recognisable on a number of current production diesels, has similar overall dimensions and mounting hole spacing to other engines of its class and yields a very good performance. Peak power is developed at moderate r.p.m. and was measured as ·0515 B.H.P. at 12,000 r.p.m. on test. It does, however, continue running strongly and smoothly up to much higher speeds and also develops high torque right down to 5,000 r.p.m. so that it can swing relatively large propellers with considerable ease. Maximum torque is developed around 9,000 r.p.m.

Starting is easy, requiring a reasonably generous prime for an engine of this size—taking care not to get the cylinder flooded. Needle valve control is not at all critical, nor is the compression setting. With a cold engine it appeared necessary to open up the needle valve at least half a turn past running setting for quick starting but a warm engine would re-start at running settings on a single choke turn. The cylinder gets very hot, which can make adjustment of the compression setting awkward, but the angled needle valve is most happily placed for adjustment. The split thimble lock is positive and trouble-free.



The A.S. "55" seemed to start more readily with small diameter propellers than with larger ones, although starting was not in the least difficult with the latter—it just needed a little more flicking. Running also appeared sweetest on plastic propellers rather than wooden ones and with the considerable variety of sizes of nylon propellers now available, one of this type would appear a logical choice.

Since peak power is developed around 12,000 r.p.m. at 7 x 3 would appear the logical size for a free flight propeller, or a 6 x 4 nylon. A 5 x 6 or a 6 x 4 nylon would be a good choice for control line flying. For sport flying, a 7 x 4 nylon would give a really "tame" motor but one still retaining plenty of thrust.

The cylinder is of cast iron finished to ·435 in. overall diameter and incorporating a flange to seat on the crankcase. Exhaust ports are cut immediately above the flange and the three transfer ports are drilled through the walls at an angle immediately below the flange. The actual transfer port opening is quite tiny—only 1/16 in. diameter—but angled upwards, slightly overlapping the exhaust. These appear to have been formed with a compound drill, giving a converging "lead in" passage to the port holes.

The space between the bottom cylinder wall and the crankcase casting forms the transfer passage, the cylinder

SPECIFICATION

Displacement: ·566 c.c. (·034 cu. in.).
Bore: ·350 in.
Stroke: ·356 in.
Bore stroke ratio: ·98.
Bare weight: 1¼ oz.
Max. B.H.P.: ·0515 at 12,000 r.p.m.
Max. torque: 6 oz. in at 8,000 r.p.m.
Power rating: ·091 B.H.P. per c.c.
Power weight ratio: ·034 B.H.P. per ounce.
Material Specification
Cylinder: cast iron
Crankcase: light alloy pressure die casting
Piston and contra piston: cast iron
Crankshaft: hardened nickel chrome steel
Con. rod: light alloy forging RR56
Cylinder jacket: turned dural
Spraybar: dural (angled)
Crankcase back cover: light alloy die casting
Tank: aluminium turning
Prop. driver: turned dural with split brass collet
Manufacturers: Allbon-Saunders Ltd. Pembroke Works, Milton, Berks.
Retail price: 55/6.

being located by the turned dural jacket which screws onto the outside of the crankcase unit. Thread o/d is ⅝ in. and a gasket is employed to seal the cylinder flange. The bore of the jacket is, of course, opened up to accommodate the cylinder flange and has relatively large exhaust ports cut in it opening into the cylinder ports. This type of assembly is perfectly satisfactory but is one which is best "left well alone" once the engine is run in and the cylinder unit never disassembled unless strictly necessary. There was no tendency for the cylinder jacket to work loose but it is obviously important to make sure that this is screwed down tight. This would be the first thing to look for if the engine became difficult to start or would not run properly.

The piston and contra piston are both of cast iron. The former has relatively substantial walls carrying the 3/32 in. diameter silver steel fully floating gudgeon pin and is then lightened at the bottom end. The top of the piston is curved. Contra piston was a very good fit and gave no trouble as regards ease of adjustment or retaining a positive setting at high speeds.

The little connecting rod is a light alloy forging with plain bearings at each end reamed to size. Fit was close on the crankpin but a little slacker on the gudgeon pin. Hardened steel crankshaft is ·239 inches diameter—quite substantial for an engine of this size—stepping down to a 4 BA threaded length for the propeller nut. Induction hole down the centre is No. 30 drill (·128 in.) and the port opening ⅛ in. diameter.

The crank web is cut away to provide counterbalance and the web, pin and journal surfaces ground to finish. Plain bearing length in the crankcase is reamed and honed to finish and the shaft is a really excellent fit throughout.

Non-slip Prop driver

A dural propeller driver with knurled friction face is mounted on a split brass collet screwed over the threaded length of shaft and then pushed home. The shaft must be pushed out carefully and the driver and collet finally unscrewed before the shaft can be withdrawn—a process which can well defy the efforts of the average owner. A thin washer and 4 BA nut complete the shaft fittings.

As can be seen on the illustrations, the spraybar is angled backwards in the choke tube and the left hand end incorporates a right-angled feed—a feature which is relatively expensive to produce but one to which we give full marks and will be readily appreciated. The advantage of being able to take the fuel pipe directly back into the tank without kinking means a much neater installation—and, usually an engine which is much easier to finger choke since the fuel does not have to be sucked up through a long length of pipe often weaving up and around the bearers before reaching the spraybar. We would like to see this type of fitting on many more engines, it will be necessary for FAI team racers.

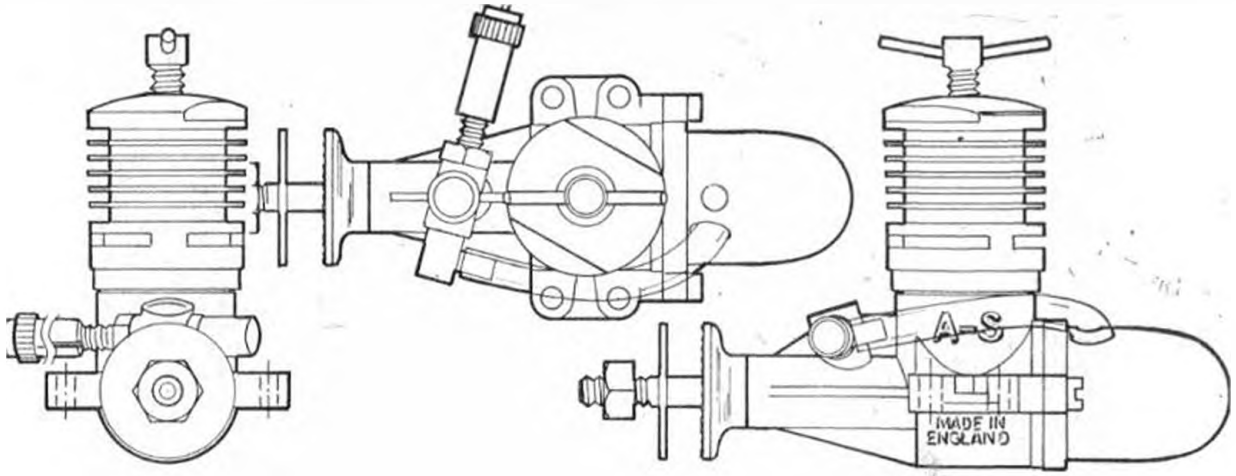
Propeller—R.P.M. Test

Propeller dia. x pitch	*r.p.m.*
6 x 4 Frog nylon	12,500
7 x 4 Frog nylon	9,000
7 x 6 Frog nylon	8,000
8 x 4 Frog nylon	7,000
8 x 6 Frog nylon	5,200
5 x 6 Frog nylon	11,000
5½ x 3½ D.C. nylon	16,800
6 x 4 D.C. nylon	14,500
8 x 4 Trucut	7,200
7 x 6 Trucut	6,500
7 x 3 Trucut	10,000
6 x 6 Trucut	8,800
6 x 4 Trucut	9,200
6 x 3 Trucut	11,500
7 x 4 Stant	8,900
6 x 4 Stant	10,500

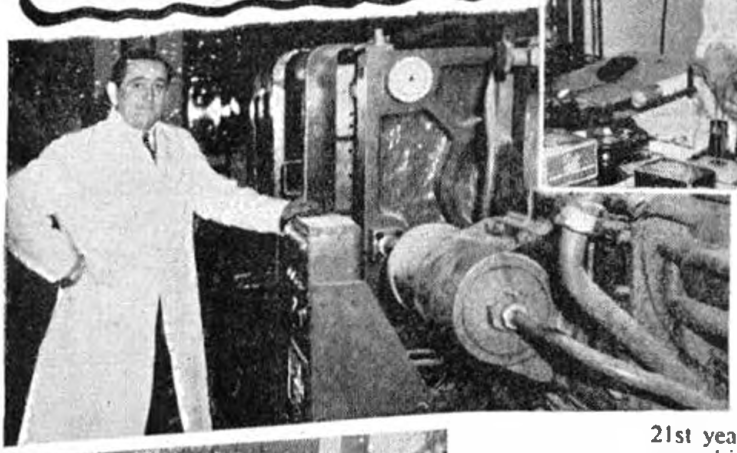
Fuel used: Mercury No. 8.
Manufacturers recommended propeller sizes:—
Running in— 7 x 4.
Free flight—7 x 4 or 6 x 4.
Control line—6 x 6 or 6 x 4.
AEROMODELLER PLANS SERVICE POWER CODING "C"

An integral tank supplied with this engine is of aluminium. It simply pressed into the back of the crankcase cover where it is held with a central bolt. One large hole provides an entry for the plastic fuel tubing, with another hole alongside it for the filler. The latter does encourage fuel to be thrown out of it and would be better if fitted with a pipe, but this is a small point. The back cover attaches to the crankcase with two 8 BA screws. These simply pick up in tapped holes in the crankcase casting and do not extend right through the lugs. The engine is not, therefore, directly adaptable to radial mounting but could be if these tapped holes were extended right through the lugs. Essentially, however, the A.S. "55" is designed as a beam-mounted engine, with or without using the integral tank.

Summarising, an engine which pleases by its appearance, fine workmanship, good handling characteristics and admirable power rating for its capacity. Plenty of power for all sport flying requirements—which is what all engines of this size are intended for, anyway—and for aerobatic performance in control line stunt with the right type of model design. A high revving engine if you want to run it fast, but its maximum power is developed at a more moderate speed. Equally, it can be a "slogging" engine driving a large diameter prop., if you prefer flying that way. *DRAWING BELOW IS ACTUAL SIZE.*



KEILKRAFT REVISITED

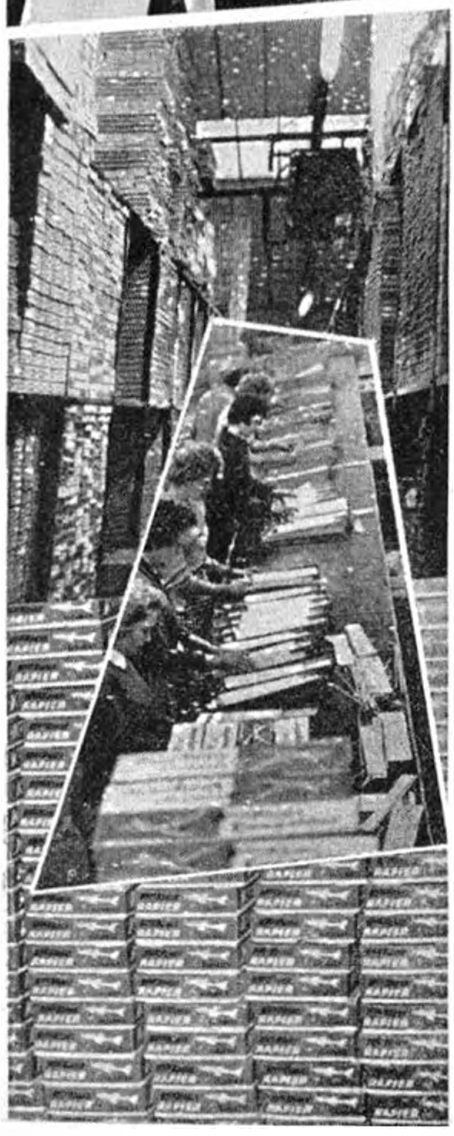


SUMMER Sunday trippers on day excursion from the great Metropolis to London's seaside playground at Southend might notice in their travels through Wickford that this Essex town is rapidly expanding. Across the fields from the railway line, they cannot fail to miss the imposing frontage of Keilkraft, production centre of all that appears under that famous trade name now enjoying its 21st year of model kitting—the last five of which have seen this industrious company extending *its* Wickford boundaries.

When we last visited KeilKraft (*September '55 issue*), the factory covered 15,000 sq. ft. and employed 70. Today, the existing buildings cover 35,200 sq. ft., and foundations are ready for another 13,000 sq. ft. of factory extensions, plus a modern canteen to serve the 150 employees. Such figures serve to emphasise the prosperity of this hard working organisation, and it is to the great credit of Directors "Eddie" and Ronnie Keil that the happy family atmosphere which always was a feature of the old Hackney Road establishment, still prevails in spite of the many changes.

One's immediate impression of this huge emporium, with its stacks of kit stores by the thousand, long production lines, injection moulding section, saw mill and timber store would well be covered by the contradictory statement of "organised confusion". Such is the vastness, that to understand the geography and working system, would take far longer than a single tour. The casual purchaser of a KeilKraft kit in the local model shop will have little appreciation of the organisation which produced his model parts, and it was with this thought in mind that we spent several hours being guided round the works by General Manager Eddie Cosh.

KeilKraft kits aim for popular appeal, they are never specialist designs, and simplicity of construction must always be blended with attractive lines to gain the approval of maestro Eddie Keil before test models are made by the experimental dept. Here in the seclusion of a sealed off corner of the main building we find new projects in the making, new engines on test and die cutting plans being checked for accuracy. Ernie Webster's little section would stir the envy of every modeller: but few would realise the exacting nature of kit "engineering" which is so essential for perfect prefabrication. The immediate programme (not forgetting that KeilKraft have introduced new kits at the rate of one per month over the past year) was progress charted on the wall, and with many test prototypes surrounding the central drawing board to identify the new titles for us, we can promise an exciting series to extend the range



Top right, two "Eddies" in conference. Eddie Keil in standard dress with sleeves rolled up for loads of hard work confers with Eddie Cosh, genial General Manager of Keil-Kraft since he left the publishing game about 18 months ago. Eddie "C" has been largely responsible for the big rush on new kits and his skilful hand in producing printed material, sales leaflets, plans, etc. is to be found in all recent K-K products. Top left, is Ronnie Keil, production specialist and Director. We caught him setting up the enormous, "Queen Mary" injection moulding machine which can produce models as large as 30 in. wingspan with one sock of its fantastic high powered hydraulic ram. Left, kit production, kits everywhere, K-K production is bigger than anywhere else in Europe and these three views typify one's impression of the KeilKraft factory.

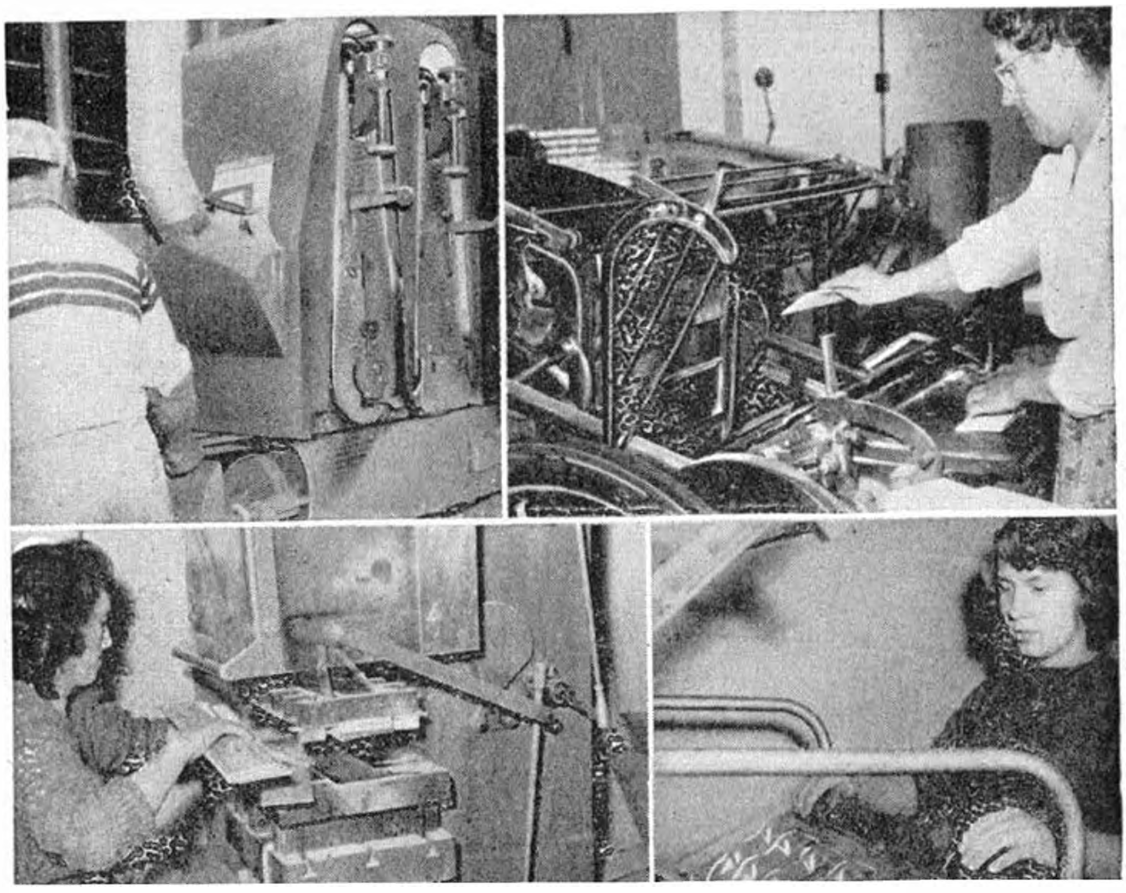
(well over 120 different kits now!) in months to come. "Snipe" is a cabin sportster for the new range of ·8 c.c. engines which will surprise many with its rate of climb on a hot motor. "Super Gaucho", as the title implies, will be for 2·5 c.c. contest power fans, and the controliners will have the "Firebird", a 2·5 to 3·5 c.c. combat model on the lines of the smaller "Firefly". This "one-a-month" rapid fire kit programme means hard work and careful planning yet KeilKraft are not neglecting the fact that some of their most popular designs are showing signs of age despite the evergreen market. Re-styled "Phantom" and "Phantom Mite" kits will accommodate all the new engines and incorporate latest simple structure methods, and the long awaited Sopwith Camel plastic will soon be joining the Hurricane.

Once passed and checked ready for production, a kit design passes on to toolmaking for dies to be shaped in specially imported razor sharp steel. At the same time, the saw mill has to prepare appropriately sized panels, strips and blocks, and it is in this large section that we see the famous KeilKraft sanded sheets. Two tall and shiny machines dominate one end of the mill. They are capable of sanding K-K's balsa (specially selected at source by the Belco company in Ecuador,—the same balsa as widely used in the U.S.A.) to thousandth of an inch tolerances. On one side the sheets were fed through on a belt, and at the other end, a smooth saw-cut free set of sheets emerges. So fine is the quality of this sanding, it also introduces a small problem when sheets go through to the print and die-cutting shop, for the balsa powder has to be removed before the printing ink will leave a quality impression.

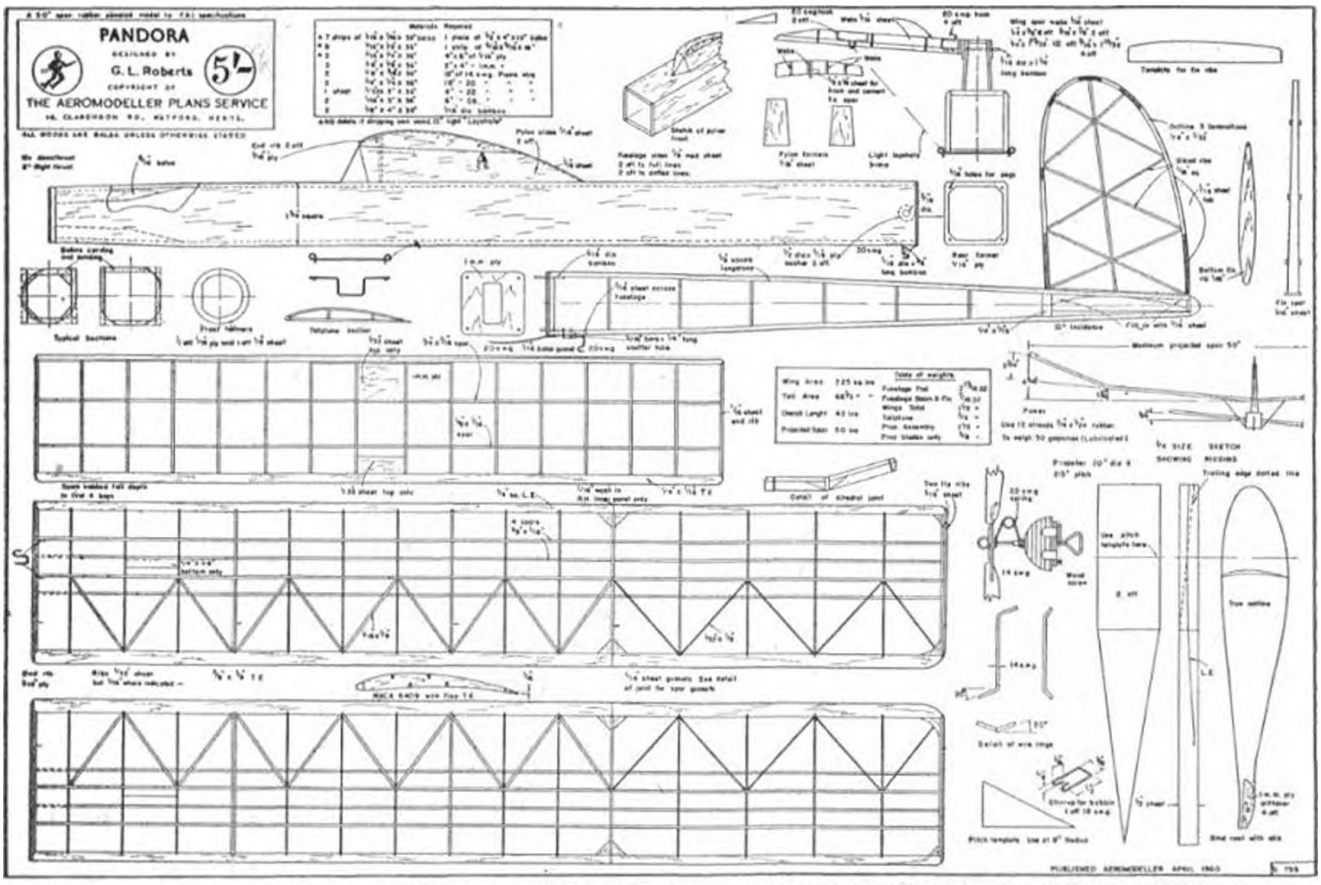
Systematic production of identical sheets in quantities of many thousands at a time enables the KeilKraft reserve store to hold sufficient stock for any emergency, as for example when one particular kit had to have a 500 run to meet a special order recently. The sight of this store, with ready processed kit parts piled floor to ceiling is probably unmatched in all the World, and its impression of both quality and quantity is to the credit of the company. Thus, with such reserves of stock a retailer would be most lucky to catch KeilKraft out of stock. Years of experience in kit packaging have taught them an infallible method of production line packing, and before our eyes, a pile of "Competitor" kits grew to a gross in minutes as the dexterous young ladies each made their contribution and the line of boxes passed from empty to full stacks.

Space in the K-K factory is, naturally enough, heavily committed to kit production: but it is shared by the plastics department, with its variety of modern machines ranging from a relatively simple vacuum former to a huge £16,000 injection moulder affectionately referred to as the "Queen Mary". Such machines are kept at work for every hour of the week day and night, and some surprisingly familiar plastic mouldings are automatically ejected with monotonous regularity on KeilKraft's contract work. This is not to say that the modelling side is neglected—far from it. We were shown a very smart control-line handle that will soon be dropping in those plastic moulding bins.

(*continued on page* 207)



Top right, Eddie Cosh confers with development and experimental "boffin" Ernie Webster, on the new "Sprite" kit with one of the pre-production planning models on the board to check die-cutting, component fitting etc. At right, one of the enormous German sanding machines with operator at left feeding in sheet over a continually moving belt. Next is one of several printing machines being hand-fed with balsa sheets for accurate and clear impression whilst bottom left, is a Precision die-cutter, (note safety guards) being operated at an impressive rate of production, die-cutting 4th sheet. Bottom right, a batch of five Seamew cockpit covers leave the vacuum former which is in constant use to keep up with the demand for the wide range of transparent mouldings etc. used in K-K kits



FULL SIZE COPIES OF THIS 1/5th SCALE REPRODUCTION ARE AVAILABLE AS PLAN D755 PRICE 5/- PLUS 6d. POST FROM AEROMODELLER PLANS SERVICE.

THE first Pandora was completed on the evening before the first Team Selection Trials in 1958. It was trimmed in the early morning before the contest and recorded 13:45 to place 8th. Same model recorded 10:38 in the 2nd in Trials of that year and this gave a final position of 12th in the Team Selection list. About this time another version was built. This incorporated several modifications, i.e. longer motor tube, a thicker fin and some structural mods. This version was left to age until March '59 before being trimmed out. About this time the two designs were extensively tested in evening conditions on identical motors. On this showing the revised version was putting up time of 15 and 20 secs. per flight improvement on the prototype. The prototype was flown in the '59 Gutteridge Trophy—(very rough conditions) to top event with 13:04. This same model was also flown in the 2nd Eliminator to score 10:36 using old motors.

At the 1st Centralised Trials the five flight total was 13:02. At the 2nd trials this same model scored 14:36 to place 2nd overall, so gaining a team place. It also placed 2nd in the Muxlow Memorial 1959 with a five flight total of 13:00.

Design requirements

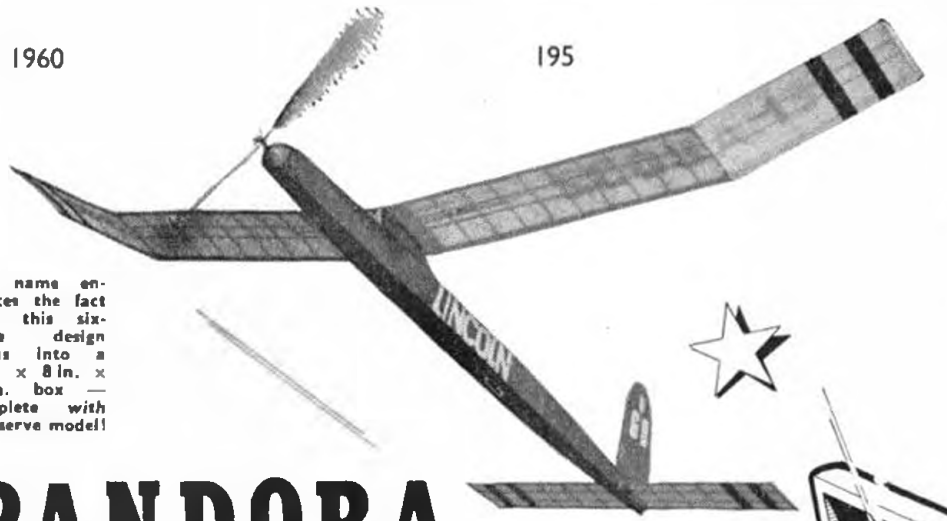
(1) Consistency, (2) Durability, (3) Ease of Packing.

This called for stability; a good power/prop combination coupled with a good glide performance. Stability was to be achieved by (*a*) Lightweight flying surfaces. (*b*) Generous dihedral.

It can be generally accepted that the most important part of a "Wake" or for that matter *any* rubber powered model, is the quality of rubber and the actual shape, pitch, diameter etc., i.e. design of prop. Since many successful "Wakes" had employed the N.A.C.A. 6409 this section was selected for the wing coupled with a moderately thick Clark Y section on the tailplane. This set-up, with CG at 75 per cent., gave an outstanding glide performance, particularly in rough conditions.

It was decided to break the design down into as many separate parts as was practical. A two piece strut braced wing was adopted. This type of wing fixing has downward deflection (from the root) but no upward deflection. Since a fuselage was required to withstand motor breakage a two piece fuselage was desirable, these halves being detachable from each other. This enabled the easy

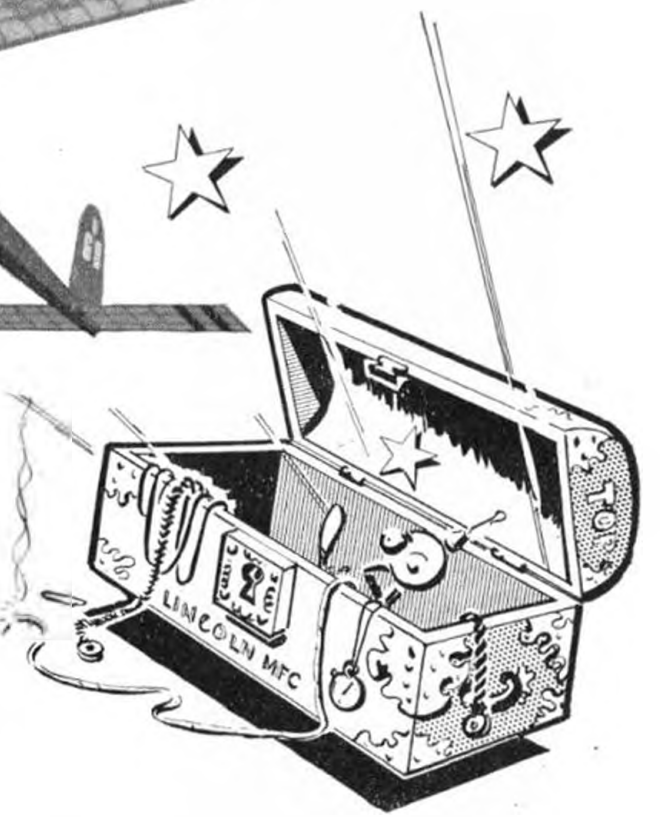
Left, Pandora at dethermalising stations with its tail cocked high. Right, Lou Roberts and the model which gained him a place in British Wakefield team last year



Apt name enhances the fact that this six-piece design packs into a 7 in. x 8 in. x 27 in. box — complete with a reserve model!

PANDORA

ONE OF BRITAIN'S TOP WAKEFIELD DESIGNS . . . By LOU ROBERTS



removal of broken motors. A simple hinge was designed for the fuselage halves, this to facilitate d/t requirements.

Construction

Fuselage sides are cut from medium ⅛ in. sheet. The top and bottom are also cut from ⅛ in. sheet and are ¼ in. less in width than the sides. One side and the bottom piece are joined along their straight portions. The remaining two fuselage pieces are treated in the same manner. Care should be taken in squaring these fuselage half shells. Nose portions of these half shells are drawn in and fastened along their edges to form the nose taper. The soft lengths of 5/16 in. are then cemented into the taper corners. The *insides* of the two shells are then silk covered leaving a ⅛ in. edge free of silk to enable the joining of the two halves. This joining operation is then carried out. The rear anchorage ply discs, the circular nose disc and the rear ply facing are then cemented in place. The boom is built in the usual manner. The motor tube and boom are lined up and the positions of the hinge and locating pegs are marked. The pegs are then securely fastened.

A fin profile is cut from ⅛ in. sheet (this profile to the inner fin shape) 3 strips of 1/32 in. softish sheet are wrapped around the profile in a cemented lamination. The solid symmetrical base rib is added upon the removal of the profile. The tapering spars are then added. Finally add the "indoor" type ribs. This structure gives an immensely strong and warp-free framework.

Construct the wings in the usual way, laying out leading and trailing edges. Fit ribs except tip dihedral rib which is fitted after setting dihedral and cement in all the spars, and gussets. Fill in the root, top and bottom with medium 1/32 in. sheet. Cement the strut attachment hook, and 1/32 in. ply facing root rib. Complete the structure by fitting diagonal bracing.

This type of tailplane structure was adopted because of the very light and rigid structure. After notching the trailing edge lay out L.E. and T.E. Cement in 1/16 in. x 1/16 in. bottom ribs. The top ribs are then cemented. The rear of these ribs require trimming to give a good area of seat. The spars are slid into place between the ribs and set in their correct position. Finally fill in centre bay top and bottom and cap end ribs.

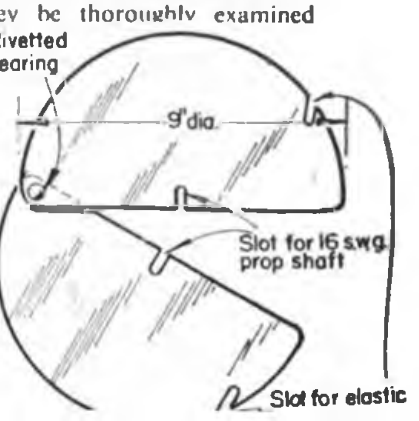
The fuselage pylon sides are cut from 1/16 in. medium sheet, pylon formers are cut from 1/16 in. sheet, the top of these formers are ¼ in. wide and open out at the base to conform to the dihedral angle. These formers are cemented into position. The sides are then fitted. Complete by building front of pylon and copping piece, not forgetting 1/32 in. ply facing and wing pegs. Pylon installation must wait until the model is balanced complete with motor and prop assembly.

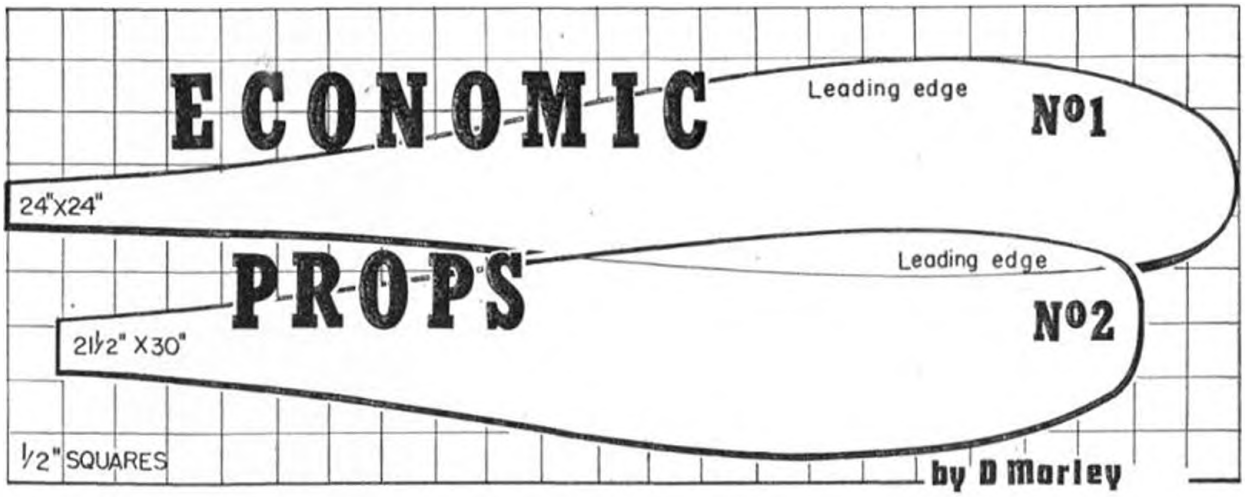
The prop is of the 2 blade folding type as used on lightweight open jobs (see article by D. Morley in this issue). The pitch was set at 25½ in. and the diameter 20 in. The width of the blades at end near the root are kept narrow so as to keep draft to a minimum. Working portion of the prop. is carved to a max. thickness of 3/32 in. with 3/32 in. undercamber. Small hooks are cemented to the rear of the blade hubs and an elastic band assists folding.

Motors

For top performance it is absolutely essential to obtain good rubber. Arrange in 12 strands, to give 50 gm. motors. Lubricate with soft soap and castor oil, and give a preliminary wind up to half turns once only. After one contest wind up these motors are unreliable and it is recommended that they be thoroughly examined before being used again.

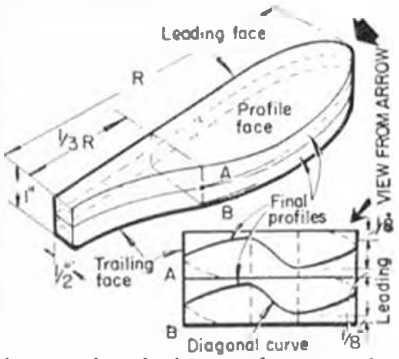
After experiences (not to be forgotten) Lou Roberts has a 16 s.w.g. alloy disc, inspired by Joe Bilgri, to protect his prop. blades in the event of a motor blowing on full turns (or less). It fits between prop and noseblock.





FIRST select a 36 in. x 3 in. sheet of medium hard balsa. Mark off 2 profiles from the template. Pin profiles together to form a 1 in. thick profiled block. Sand all edges, this giving identical blade shapes.

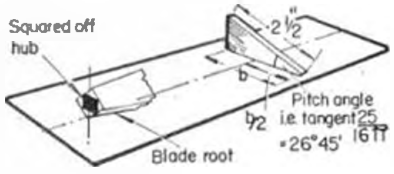
At a point ¼ of blade length from the root mark off and square round block. From the points A and B (see the diagram) mark straight lines diagonally around trailing faces of profiles, terminating at the profile tips ⅛ in. from the profile face. Rotate the whole block through 180 deg., so that the leading face occupies the previous position of the trailing face. Repeat the marking off operation with new points A and B. These lines indicate the positions of the leading and trailing edges on their respective faces. These lines are merged at the profile tips by a smooth diagonal curve (see sketch).



The two profiles are then separated. At 45 deg. (approx.) a chamfer is made on the waste edges of the profiles i.e. on the leading and trailing faces. The chamfer should start 1 in. from the blade root and follow the diagonal leading and trailing edge markings. Great care should be taken when deciding which portion is to be removed in the chamfer.

The rear faces of the blades are then carved to give 3/32 in. undercamber at the widest section of the blade. The undercamber is run out as the blade width narrows towards the root and tip. Care must be taken when merging the tip 45 deg. chamfers (leading and trailing edges) with the carving of the undercamber. The top or front faces of the blades are then carved in the usual manner. The blade thickness should be 3/32 in., thickening out towards the root.

A right-angled triangle of ¼ in. scrap is cut. The hypotenuse is 2½ in. long. The smallest angle is to be the pitch angle at 2 in. from the blade tip. This angle will give a pitch of 25 in.



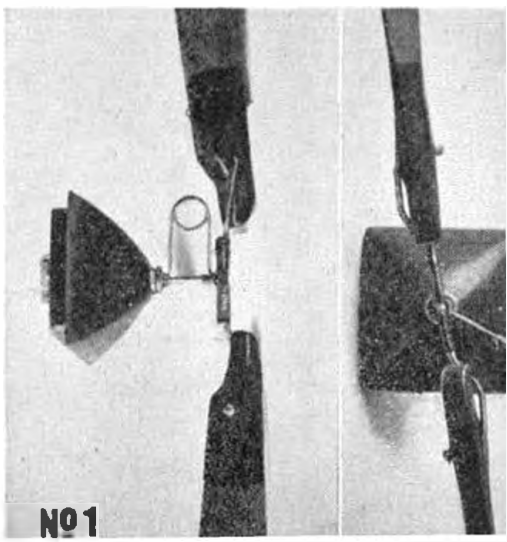
This triangular piece is lightly cemented perpendicular to a base board and at right-angles to a centre line marked on the base board. This centre line runs through a centre point on the intermediate side of the triangle.

One blade is then lightly cemented to this simple jig, taking care that the blade is in the correct position on the jig to give the desired pitch. The effect of this is to place the blade in its relative working position. This turning of the blade through the pitch angle causes the blade to rest on one corner of the hub, (since no carving has been done here). This corner is then lightly cemented onto the base board centre line at the same time as the cementing of the blade to the triangular jig piece. This then provides a firm setting to enable the squaring off of the blade roots. The squaring off is done by setting up a set square perpendicular to the base board and marking acros the hub and either side of the root centre line. The distance either side of this centre line to be to the builders discretion. It might be mentioned here that this marking off should be accurate as a later bushing operation requires to be set up from these new faces. This squaring has given the markings for the sides of the intended hub. The front and back of the hub are squared through from these side markings. Repeat this marking off operation on the other blade.

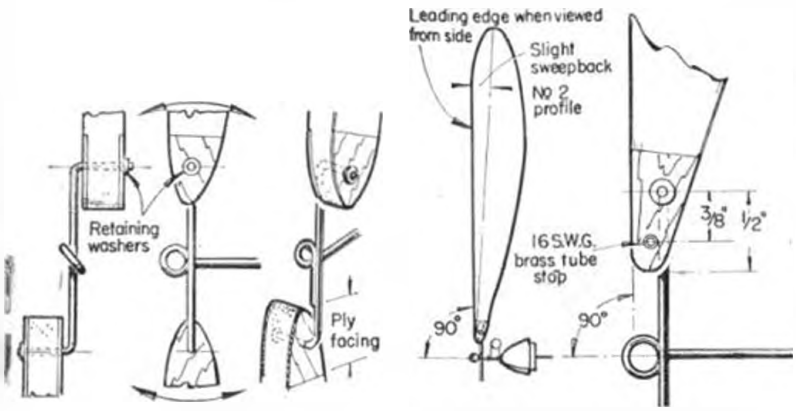
Neatly trim the hubs to these markings. Face sides of hubs with 1/16 in. ply to a depth of ¾ in. These 1/16 in. ply facings may be cemented onto recessed hub faces. When the facings are securely fastened, the hubs are trimmed into the blade so that a gradual change of section occurs. The hubs are bushed with standard brass bushes, filing bushes flush with ply facings. The position of the bushes should be such that they are square to the hub, ¼ in. from the root end and central.

At this stage the blades are given a final sanding and balanced. One and a half inches (1½ in.) of the blade roots and hub are covered in silk, finally covering the whole blade with coloured Jap tissue and 3 coats of 50/50 dope-thinners.

The blades are then fitted to the wire hub and are kept in position by soldering small retaining washers onto the ends of hinge pin part of the hub. It is then required to fit stop pins to the prop hubs.



Hub detail of the Number One prop. which is rather complex in the front view. Blades and hubs have a common centreline, made before it was realised that this was not necessary. Note also, the spring tensioner



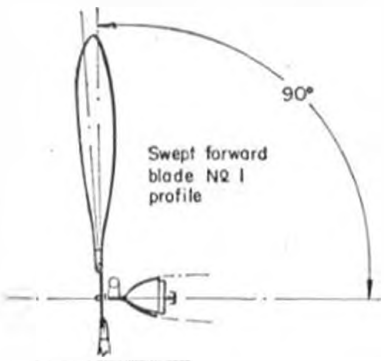
This fitting of the pins can be done in several ways. I favour the following:—

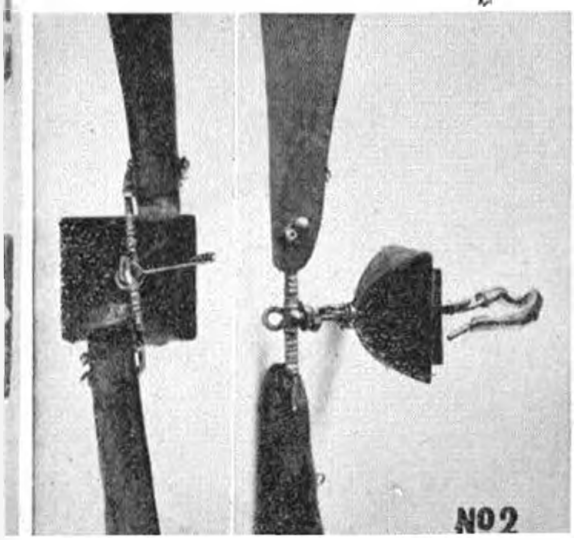
One blade is held in its operating position i.e. when viewed from the side the leading edge makes a right-angle with the prop shaft. This gives a slightly swept back effect.

Parallel to and ¼ in. from the centre, drill a suitably sized hole in front of the *wire* hub to receive a piece of brass tubing of 16 SWG bore, the length of this tubing to be the prop hub width plus 3/16 in. Fit the brass tubing into place so that it just extends over the wire hub. To restrict any movement of this "stop", lightly bind and solder either side of blade hub. This operation is repeated on the other blade being careful that both blades are normal to the prop. shaft. This ensures that both blades track in the same path.

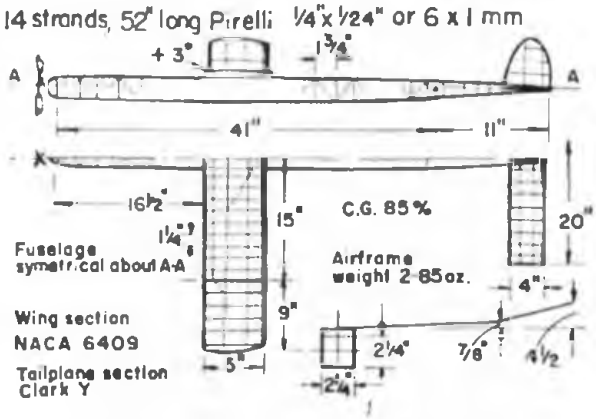
The reason for the unusual blade shape (No. 1) was to try to produce a prop. which when turning at peak revs *flexed* to give an *increase* in pitch, hence a longer and smoother motor run resulting in a greater overall duration. The hubs were carved very narrow, widening out on the leading edge portion of the blade from a fixed centre line (no widening on trailing edge portion). It was assumed that this centre line would correspond with the flexural axis.

A complex hub (No. 1) was necessary to allow the blades to be on one centre line. I have found, supported by other rubber competitors, that this alignment of the blades is *not* essential and does, in fact, present some difficulties as





The Number Two hub with soldered and bound centre assembly, and incorporated winding loop (also note the S hook for rubber). Blade stops are as described in the article and the same style tensioner is employed



Specifications of model for Number 1 propeller

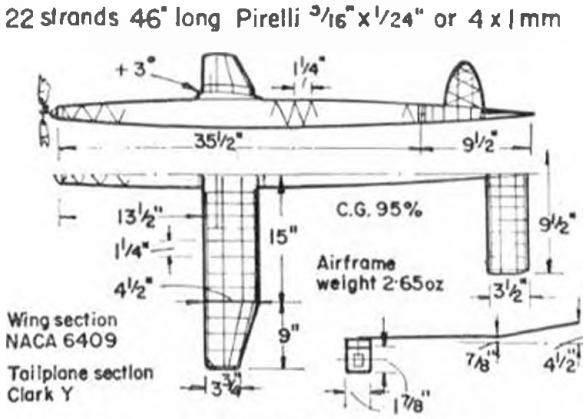
compared to the simple rightangular hub already described. Through actual test flying I have found that this type of blade requires to be swept forward when viewed from the side.

The No. 1 prop has proved highly successful and has been in use on same model since October, 1958. On 1,000 turns (90 per cent. turns) a motor run of 2+ minutes duration is achieved. Diameter and pitch are both 24 in., and weight of whole prop. assembly is 0·6 ounces including nose block. The No. 2 prop is relatively new, on the only contest outing to date (Loughborough College Rally, 1959) the model turned in 4 min. ·05 secs. in the fly off to place 4th on 75 per cent. turns; damp and foggy conditions. Diameter is 21½ in., pitch 30 in. and weight of the assembly 0·75 ounces.

In conclusion, this ¼ in. sheet method offers a cheaper, simpler and quicker way of producing a prop than does the more conventional way. If carefully selected, ¼ in. sheet is likely to have more consistent grain qualities than, say, a 2 in. x 1 in. block, hence it is less prone to warp.

Such comment which I feel must be made in support of the wire hub, is that these 14 and 16 s.w.g. hubs do not produce the drag that a solid hub produces. They remove the difficulties that are encountered when making a solid hub which has alloy back plate having skewed hinges. Wire hubs make for a saving in weight.

It is intended to carry prop development a stage further and work along the lines of Zurad of Poland, and Ivanikov of Russia i.e. having the blades on extended hubs. An open mind should be kept on all possible development until one can satisfy oneself by actual flight tests.



Specifications of model for Number 2 propeller

April, 1960

AIRCRAFT DESCRIBED No. 100

To celebrate our Century in this series Ken McDonough has contributed this complete feature (plus cover painting) on the fabulous . . . .

Hawker Hurricane

FEW fighter aeroplanes can rival the record of the Hawker Hurricane. It ranks as the supreme example of persistence and adaptability. Its service life was apparently ageless, its exploits legion. Throughout the Hurricane's long career there is not a single record of structural failure attributable to any fault in the airframe and it acknowledged no limitations of armament. It served on every front and resolutely accepted every demand without ceasing in essence to remain the Hurricane.

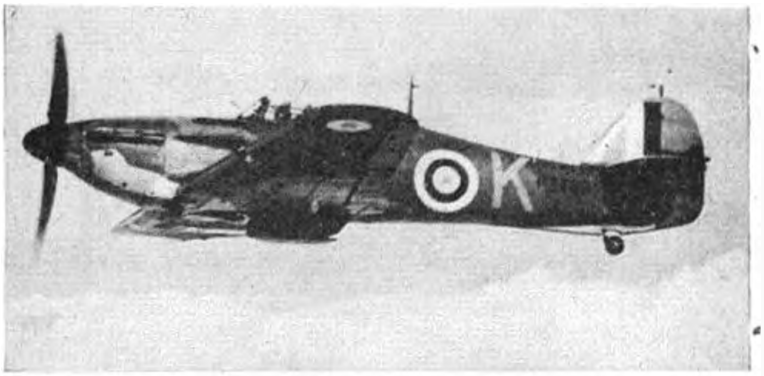
In 1931 Hawkers presented the R.A.F. with the Fury—the first fighter of any nation to attain 200 m.p.h. Early in 1933, Hawker's chief designer Sir Sidney Camm realised that something even better was needed if Britain was to maintain her head in the forefront of the air forces of the world. The Hawker Fury monoplane was the result—a cantilever monoplane with fixed undercarriage and 660 h.p. Rolls Royce Goshawk engine. At this time 4 machine guns were considered adequate; but higher speeds reduced the time an enemy could be held in the pilot's gun sights and eventually plans were amended to accommodate 8 machine guns all mounted in the wings. The new Rolls Royce Merlin I was fitted and the aeroplane outstripped the original conception—it was no longer the Fury monoplane—the name Hurricane was chosen, a name which will live forever in the annals of the Royal Air Force.

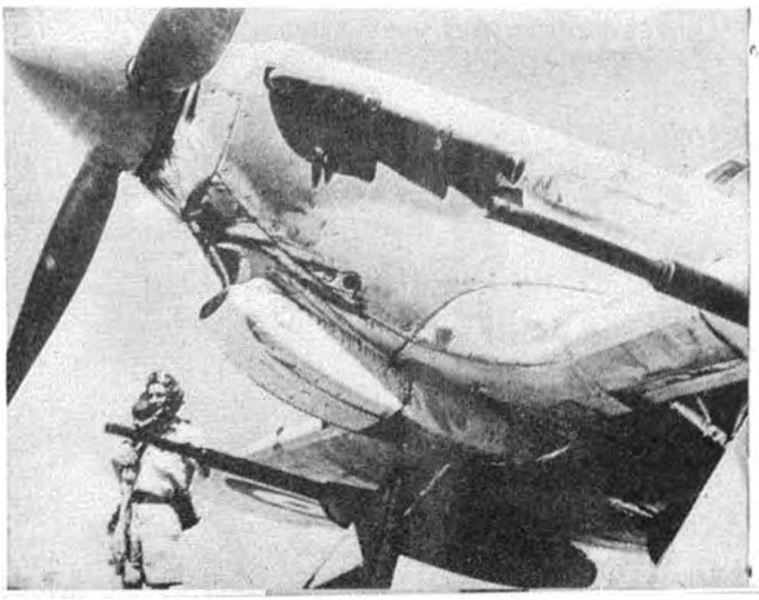
"High Speed Monoplane" K5083, the Hurricane first flew on November 6th, 1935 piloted by Hawker's chief test pilot, Flt.-Lt. "George" Bulman. On landing he reported that it handled perfectly and was free from vices. A remarkable achievement in view of the radical departure from accepted design standards. Even at this date the retractable undercarriage was considered by many an extravagant novelty.

In March 1936 production drawings were started and tooling up commenced for an initial 1,000 Hurricanes, the first production machine L1547 making its maiden flight on October 12th, 1937. The Hurricane first entered service with No. 111 Sqdn. stationed at Northolt at the end of the year and early in the new year made front page news when S/Ldr. J. W. Gillan, Officer Commanding 111 Sqdn., flew from Edinburgh to Northolt (assisted by a tail wind) at an average speed of 408 m.p.h. Such speeds had not been known since Schneider Trophy days and the Nation first realised that service aeroplanes were entering a new era.

At the outbreak of war in September, 1939, the Royal Air Force returned to France for the first time in over 20 years, this time equipped with Hurricanes—a far cry from the fragile biplanes of the first World War. Here the Hurricane first proved its worth in combat and by the time of the Battle of Britain, it already enjoyed a formidable reputation. Before this, however Hurricanes

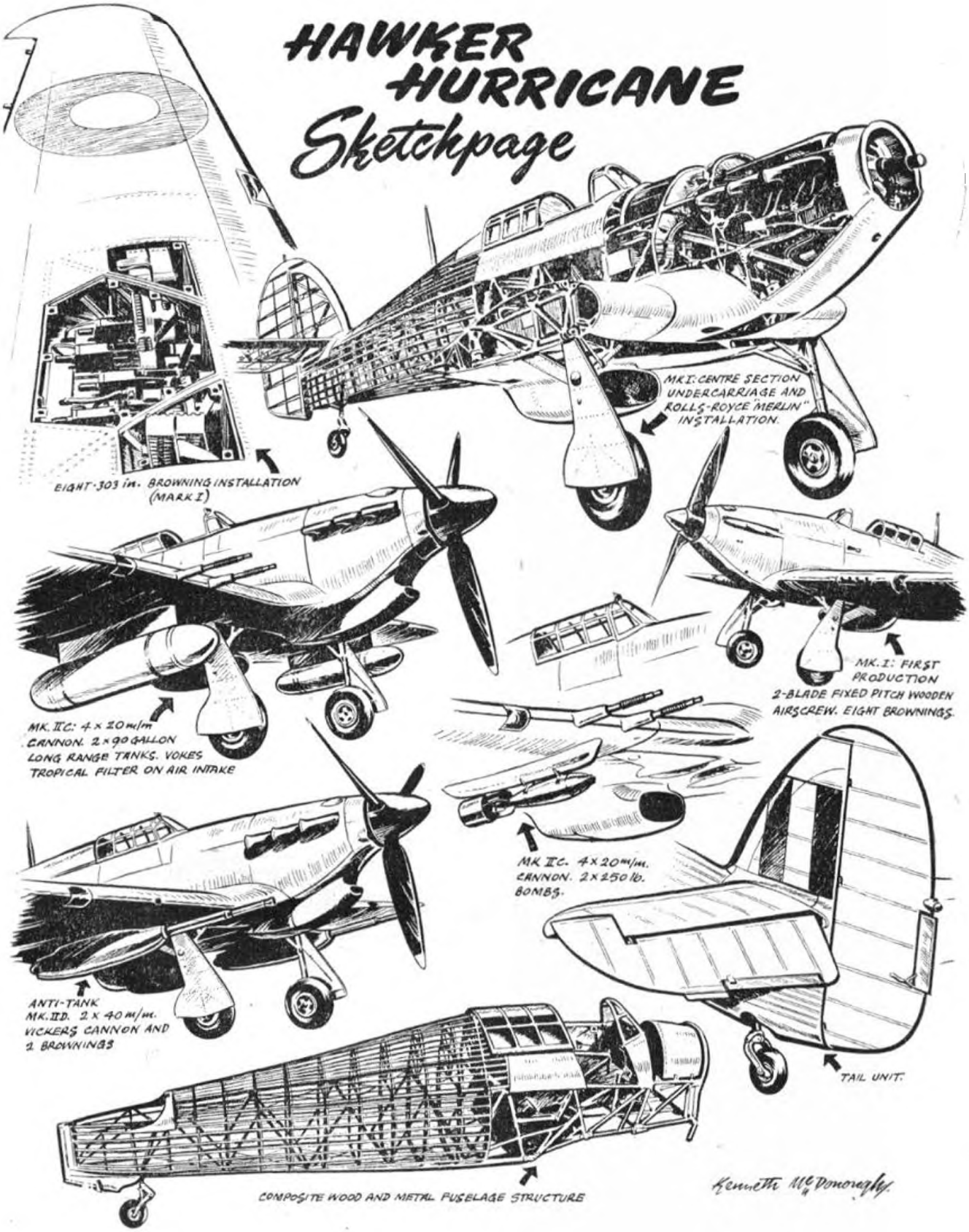
(*continued on page* 202)





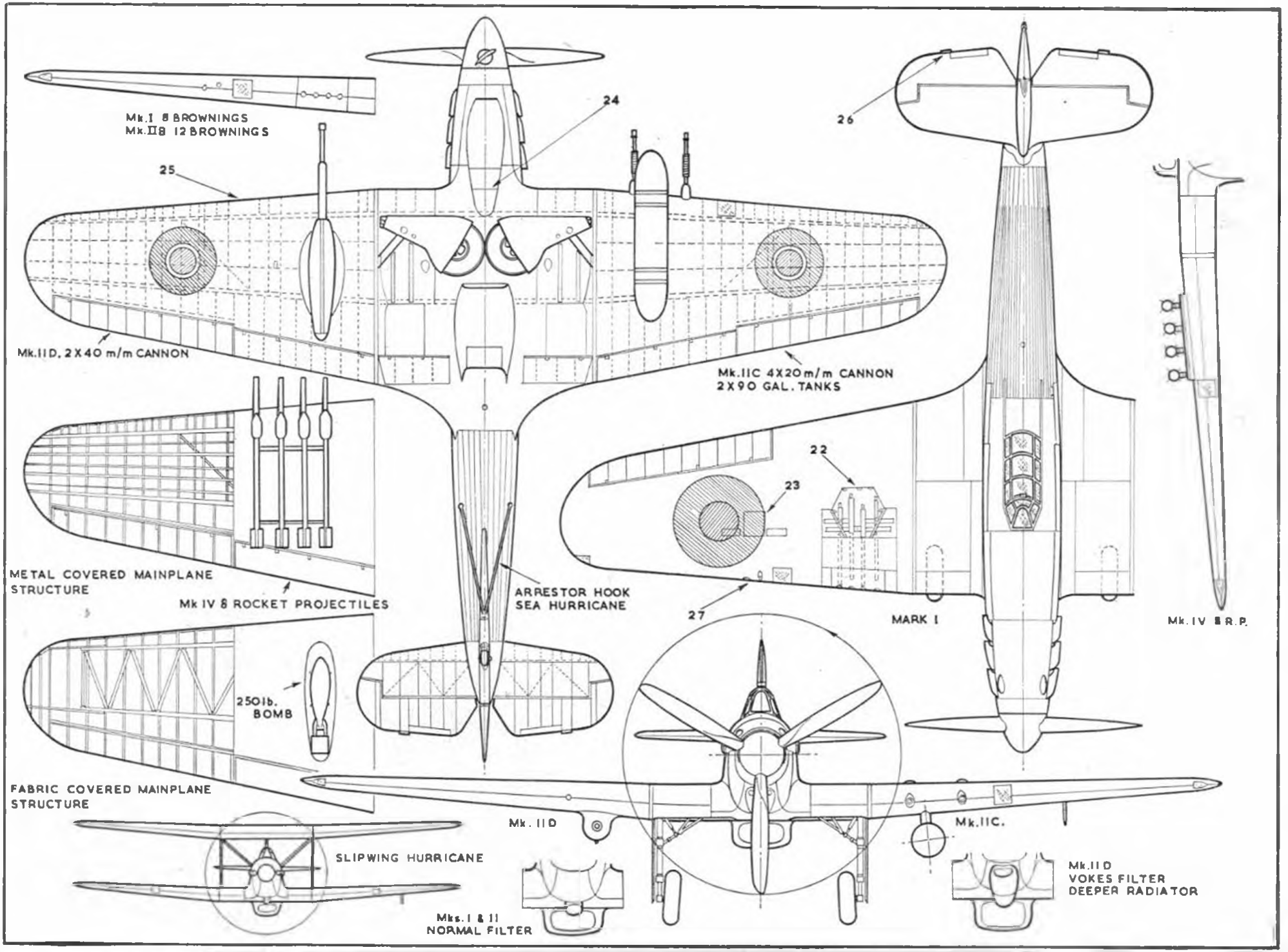
Heading photo shows last Hurricane built, PZ865, now G-AMAU, piloted by "George" Bulman. Note, "The last of the many" inscribed below cockpit cover. Right, top: A Mk. I with individual letter "K", only, and pre-December 1940 tail fin flash, as operated in France. Below: A Mk. IID anti-tank version with 40 mm. cannon and tropical filter, with early style roundels under wing. Standard temperate land scheme was dark green/dark earth on upper surfaces with "sky" undersides to 1942, sea grey medium after then

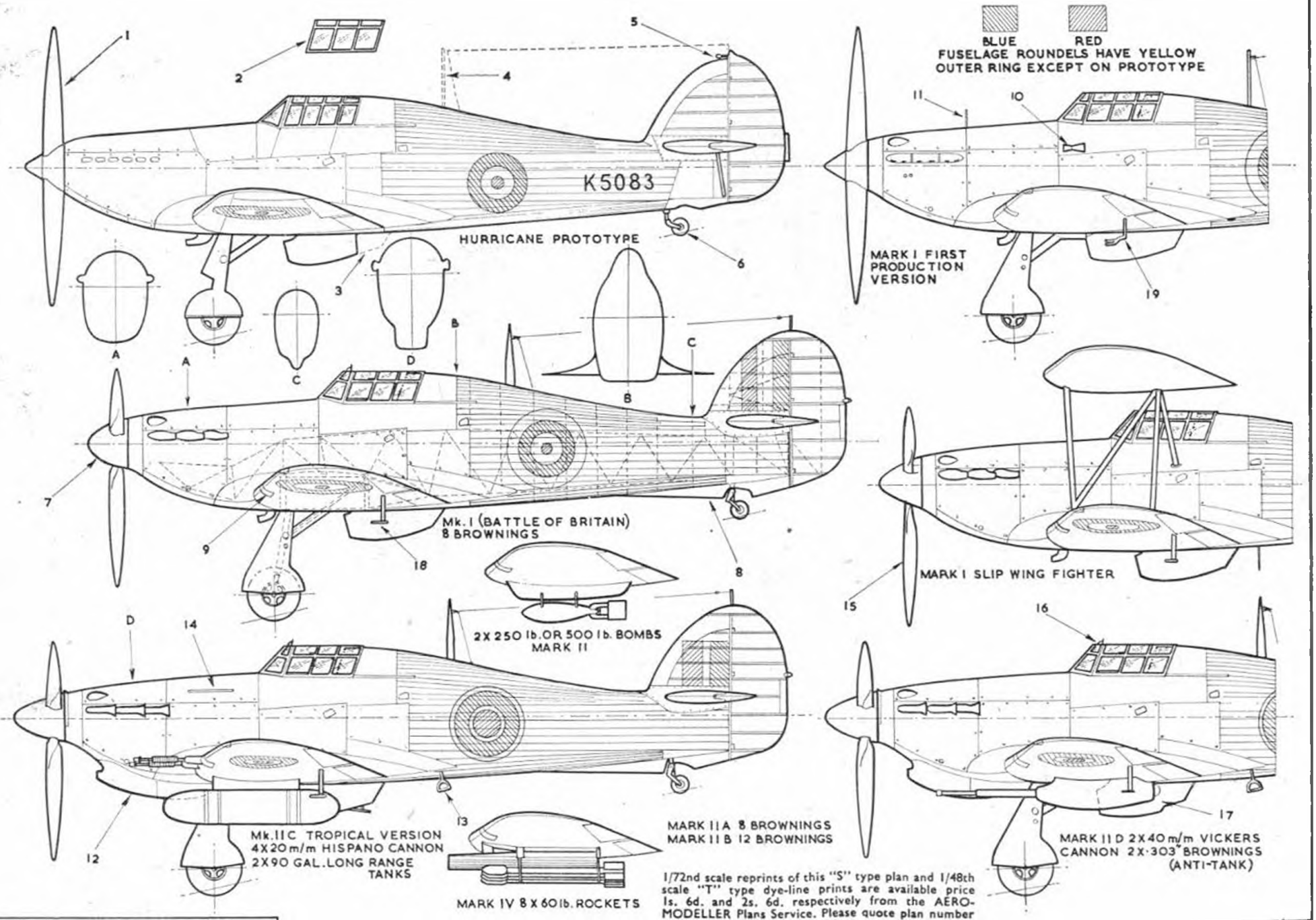
HAWKER HURRICANE Sketchpage



HURRICANE DRAWING KEY (see overleaf)

1. Fixed pitch wooden airscrew.
2. Modified cockpit canopy.
3. Modified radiator.
4. Radio mast—last modification.
5. Mass balance.
6. Retractable tail wheel.
7. Rotol constant speed airscrew.
8. Anti spin strake.
9. Landing light.
10. Venturi tube.
11. Gun sight.
12. Vokes tropical air filter.
13. Foot stirrup.
14. Exhaust glare shield.
15. De Havilland 2 speed airscrew.
16. Rear view mirror.
17. Deeper Radiator.
18. Air speed indicator pitot tube.
19. A.S.I. Pitot tube (early type).
20. Vickers 40 m/m.
21. Hispano 20 m/m.
22. Loading bay. 8 Browning installation.
23. Loading bay. 12 Browning installation.
24. Normal air intake.
25. Landing lights omitted on Mk. IID.
26. Manually operated trim tab.
27. Gun ports Mk. IIB 12 Brownings.


Mk.I 8 BROWNINGS
Mk.II 8 12 BROWNINGS
24
25
26
Mk.IID. 2X40 m/m CANNON
Mk.IIC 4X20m/m CANNON
2X90 GAL. TANKS
22
23
27
METAL COVERED MAINPLANE
STRUCTURE
Mk IV 8 ROCKET PROJECTILES
ARRESTOR HOOK
SEA HURRICANE
MARK I
Mk. IV 8 R.P.
250lb.
BOMB
FABRIC COVERED MAINPLANE
STRUCTURE
Mk. IID
Mk. IIC.
SLIPWING HURRICANE
Mks. I & II
NORMAL FILTER
Mk.IID
VOKES FILTER
DEEPER RADIATOR



1/72nd scale reprints of this "S" type plan and 1/48th scale "T" type dye-line prints are available price 1s. 6d. and 2s. 6d. respectively from the AERO-MODELLER Plans Service. Please quote plan number 2721 and add 6d. postage.

HAWKER HURRICANE MKS. I - IV

FT.

Top Left: Mixed Hurricanes IIA and IIC formation in echelon to starboard. Note absence of 18" rear fuselage band, introduced December 1940, on these 87 Sqdn. aircraft which carry 1942 type roundels. Below them is a typical Battle of Britain 'At Readiness' scene at R.A.F. Debden in Essex, 1940. Two scrambled Hurricanes gain height at speed as "F" ground crew, connected starter batteries and parachute on wing wait for action warning. Grey code letters XR denote 71 Eagle Sqdn.

HAWKER HURRICANE (*continued from page* 198)

of No. 46 Sqdn. took part in the desperate fighting in Norway, brought into action by the aircraft carrier "Glorious". When the order came to evacuate, the Squadron flew all its Hurricanes on to the "Glorious" without arrestor gear rather than resort to destroying them, but this gallant effort was in vain when the carrier was subsequently sunk. Similarly, Hurricanes flown from H.M.S. Argus reinforced the desperate Gladiators in the Battle of Malta.

In the Battle of Britain, the Hurricane bore the brunt of the fighting and the vision of her designer was justified. The aeroplane had now changed slightly from the early production mark, among other modifications, a 3-blade controllable pitch airscrew was fitted. A ventral fin faired the fixed tail wheel to improve handling qualities and metal had replaced fabric covering on the wings.

Of all the Squadrons fighting so valiantly in this epic struggle, the shortest possible list would have to include No. 32 Squadron operating from Biggin Hill. Unfortunately space does not permit mention of every squadron taking part.

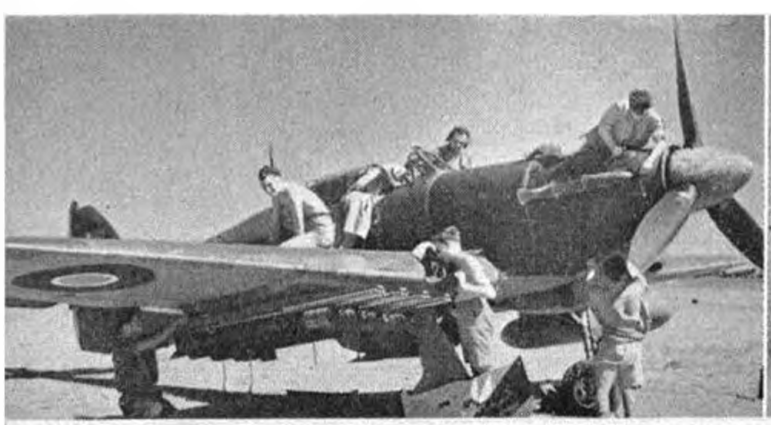
The Hurricane Mark II first flew on June 11th, 1940 with Merlin XX two-stage supercharged engine. Variations in armament ensued rapidly. The Hurricane took them all in her stride and a special set of mainplanes were made to accommodate the various "stores". The Mk. IIA retained the eight Brownings. On the Mk. IIB these were increased to no less than 12 guns. Four 20 mm. Hispano cannons replaced the rifle-calibre guns on the IIC, and on the Mk. IID two 40 mm. Vickers cannon with two Brownings firing tracer ammunition for sighting turned the Hurricane into a weapon which spelt death to tanks in the Western Desert. To increase the range, 90 gallon drop tanks were suspended below the wings on the IIC and armed with 4x20 mm. cannon the Hurricane a familiar sight with its Vokes sand filter, kept the skies clear of enemy aircraft during the North African campaign.

After early experience of deck landing Hurricanes, an arrestor hook was fitted and in this form was known as the Sea Hurricane Mk. IB. Others were catapulted from merchant ships and these were largely considered expendable, the pilots parachuting into the sea. Apart from its role as a purely fighter aeroplane, the Hurricane served as a fighter bomber with two 250 lb. and later two 500 lb bombs below the wings. The aeroplane was also used for night fighting and pioneered the use of rocket projectiles until the advent of the Typhoon. In this guise it was known as the Mk. IV. Hurricanes served in the Far East against the Japanese and several thousand went to the U.S.S.R.

Mention must be made of at least one interesting experiment. A supplementary wing of identical shape and area was fitted to a standard Mk. I Hurricane to enable it to take off with a much greater load. This wing was released in flight. A long series of tests were conducted but the project did not proceed beyond the experimental stage. Another version of the Hurricane was equipped with floats.

No less than 12,750 Hawker Hurricanes were built in Great Britain and 1,451 in Canada. Each year a Hurricane has led the R.A.F. fly-past over London in commemoration of the Battle of Britain and long after the last Hurricane has gone, this redoubtable aeroplane will live in the memories of all who knew her.

Variety of duties and markings—Left: A tropical Mk. IV in Middle East scheme of dark earth and middle stone. Note rocket mounting under starboard wing and long range tank under other side. *Normally* two sets of rocket rails or two tanks were carried. Right: Night fighting IIC of 3 Sqdn. (QO code letters in dull red). Official term for all-black non-reflecting finish was RDM2. Aircraft of this Sqdn. were used from Hunsdon, Herts in conjunction with Turbinlite Douglas Havocs, with powerful searchlight designed to illuminate enemy bombers, enabling the formating weapon carrier fighters to operate



READERS' LETTERS

Matter of principle

DEAR SIR,

I read with interest, under World News in your February issue, that there is the likelihood that the Belgian delegate to the C.I.A.M. of the F.A.I. will propose at the next meeting that whipping should once again be permitted in team racing. If this is a serious suggestion on the part of the official organ of the Belgian modellers' organisation it is to be deplored.

The decision to ban whipping in team racing was proposed by Finland at the last C.I.A.M. meeting on October 25th last year. The proposition was actively supported by Gt. Britain, U.S.A., Sweden and Hungary. Only the Chairman of the meeting spoke against it and the proposition was carried unanimously, Belgium abstaining, the Belgian delegate M. Bienvenu having taken no part in the discussion.

In the circumstances, it is difficult to understand how the Belgians can justify bringing this matter up in an attempt to reverse a decision arrived at in a proper democratic manner in Committee.

London, N.7. H. J. NICHOLLS

Praise for plans

DEAR SIR,

May I congratulate you on your *Unlimited*. It has stood up to 472 (!) major crashes to date. Is this a record? The only repairs required have been to the engine mounting. (This large number of crashes is due to the fact that it has been used as a trainer by over a dozen people). The first two engines are write-offs and the third, an E.D.2·46 is pretty battered.

Godalming, W. I. INGHAM
Surrey.

DEAR SIR,

I would take the opportunity to state that I have built many planes from your drawings with great satisfaction. The *Lulu* won the South African Nats. for me many years ago against much larger, complicated sailplanes, and also a few local contests. Thus far I have lost 7 *Lulu's*, in spite of d.t's. Is this a record?

Johannesburg. ALBERT HERDEN

Free flight C/L

DEAR SIR,

I possess an Allen-Mercury 35 powered Veron *Combateer* (control line). During the recent snow fall. I decided to try skis, instead of wheels. My friend and I decided to try the model on a flat snow covered piece of ground. We warmed the engine up, without the lines on, and while still running put the model on to the ground. We expected the model to just slide slowly forward, but it gathered speed rapidly, while we stood dazed. After about 70 ft. the model lifted gently off the ground and gained height. Slowly the model turned and after about 20 seconds it landed in the long grass without any signs of damage.

Sirs, I am sure that this model with little alteration could be converted to free flight.

Luton, J. SMITH
Beds.

F.A.I. team racers

DEAR SIR,

Regarding F.A.I. Spec. Team-Racers—Design Rules—*Ducting in fuselage*.

According to the plans, detailed in AEROMODELLER December 1959 of N. Bernard's model "Startiger" an air-exhaust duct within the stipulated height (4 in.) for T/R fuselages is employed, although the *exit* is shown towards the rear of this cockpit part.

A duct of this nature causes a measurable increase in a model's performance, due to a decrease in drag, "smaller fuselage" depth, and a cleaner cowling, giving better motor performance. Previously I had been led to believe that the detailing described could only be employed if the required fuselage depth was correct from cockpit to duct *topside*.

I would be grateful if you could clarify this problem both the S.M.A.E. and the .A.I.F rulings being rather vague i.e. is the system allowable in the world championship contests abroad only, or can it be employed under S.M.A.E. rules—or not at all?

Hamilton, G. S. MCPHAIL.
Lanarskshire.

(*F.A.I. T/R enthusiasts should closely study the current* Code Sportif. *Bernards duct is eligible as it is enclosed but* not *his painted cabin or his external fuel feed line according to our interpretation of rule* 4.10.3.—*Nery Bernard tells us he is altering his model, which may be competing at the British Nationals*.—ED.)

Indoors . . . underground

DEAR SIR,

The very interesting report in the "World News" feature of the March AEROMODELLER concerning the flying of indoor model aircraft in a large cavern in Germany, raises a very interesting point.

For many years indoor flying in this country has suffered from a dearth of suitable halls. Yet in the Peak district of Derbyshire, there exists a large number of caverns at least one of which may prove suitable for the purpose. The first two which spring to mind are the "Peak Cavern" and the smaller cavern known as "Lord Mulgrove's Dining Room".

The Peak Cavern has a very high ceiling. Even allowing for the taper of the roof, which would of course limit the usable height, the ceiling would allow over a hundred feet of available space, probably a great deal more. The difficulty here lies in the very uneven floor and possible retrieving troubles.

The smaller cavern has a very useful height and a much better general shape and floor.

These are of course, only two of the better known caverns. The smaller access tunnels have a steady, but not too strong flow of air, due to underground streams, but in the larger caverns the drift is almost zero.

The caverns are all privately owned and many are open to visitors. This may mean difficulty in obtaining permission, so obviously any such approach is best made officially by the S.M.A.E. However, for the present I would very much like to hear any views which may be held by your readers on the subject before making any approach to the S.M.A.E. Your readers will almost certainly know a great deal more about the caverns and may know of more suitable caves or of unforeseen snags in the two I have mentioned.

Shiregreen, R. HURST.
Sheffield 5.

Plea for realism

DEAR SIR,

I am a keen scale modeller, of the kind which goes to great trouble and research before building a model. The subject of finishing these models is of special interest to me.

Imagine my horror on seeing a host of scale models, flying and non-flying alike, with highly polished metal foil coverings simulating "natural metal". How many of these modellers have ever seen the aircraft so adorned in the "flesh". Few. I can assure them that few of the Super Sabres, Herons, Viscounts and similar aircraft have anything but a dull-silver finish. The standard silver enamel or dope finish is far more accurate, however painstaking one must be in applying it evenly.

To the silver foil (and wallpaper) merchants I would say: make sure your aircraft *has* a highly polished finish (generally not found on aluminium) before laying a hand on that pretty metal foil.

ACI GIBSON, R. C.
R.A.F., Bassingbourne, Cambs.

More Hart gen

DEAR SIR,

There may be many people like myself, who, although aircraft enthusiasts, are not aeromodellers, but nevertheless take the AEROMODELLER for the interesting aircraft type history articles by Messrs. G. A. G. Cox, P. L. Gray and others. These are in the main excellent, but I felt that since the title of the aircraft in the February "Famous Biplane" was the Hawker Hart, we should have been told more of the Hart and less of the Audax, Demon, Hind, etc. which are subjects in themselves.

There were a number of types of Hart, let alone the variants under other names, and nothing was told of the Hart (Special), Hart (Comm.) or Hart (Intermediate). A production and type summary by serial numbers would I imagine enhance the general value of all such articles, and I append such a table for the Hart.

Brockley,
London, S.E.4. B. ROBERTSON.

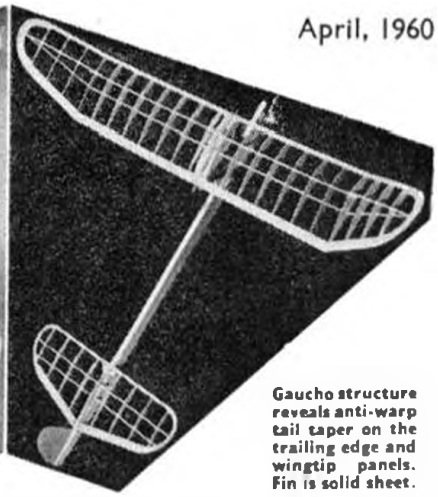
R.A.F. HARTS

Qty.	*Duty*	*Constructor*	*Serials*	*Remarks*
15	Day Bomber ...	Hawker	J9933-9947	First production batch.
32	Day bomber ...	Hawker	K1416-1447	K1438 Audax prototype.
1	Experimental ...	Hawker	K1996	Became 1141M.
50	General Purpose	Hawker	K2083-2132	Built for service in India.
52	Day Bomber ...	Hawker	K2424-2475	K2434 fitted with Napier engine.
65	Day Bomber ...	Vickers	K2966-3030	K3013 converted to Hardy.
24	Day Bomber ...	A.W.A.	K3031-3054	K3036 Merlin test-bed.
18	General Purpose	Hawker	K3128-3145	Hart (Special) Audax conversions.
13	Trainer ...	Hawker	K3146-3158	First trainer production batch.
21	Trainer ...	Hawker	K3743-3763	Some fitted for night training.
47	Day Bomber ...	Vickers	K3808-3854	Several modified for armament training.
18	Day Bomber ...	A.W.A.	K3855-3872	K3865 modified to Hardy.
2	Communications	A.W.A.	K3873-3874	Known as Hart (Comm.).
30	Day Bomber ...	A.W.A.	K3875-3904	Several modified for armament training.
2	General Purpose	Hawker	K3921-3922	Built for service in India.
18	Day Bomber ...	A.W.A.	K3955-3972	Some modified as intermediate trainers.
2	Communications	A.W.A.	K4297-4298	Known as Hart (Comm.).
40 (approx.)	General Purpose	A.W.A.	(Hart (Special)	conversions from Audax batch K4365-4436).
59	Day Bomber ...	A.W.A.	K4437-4495	Some modified as intermediate trainers.
167	Trainer ...	A.W.A.	K4886-5052	Kestrel X fitted.
114	Trainer ...	Vickers	K5784-5897	Kestrel X fitted.
146	Trainer ...	A.W.A.	K6415-6550	Kestrel X fitted.
5	General Purpose	Hawker	K8627-8631	Built for service in India.

Trade Notes

REPRINTS of the very popular **Harleyford Publications'** books "Air Aces of the 1914-18 War" and "Von Richthofen and the Flying Circus" are now avilable at 45s. each. We have had the opportunity of studying copies of the new editions which are distinguished by their very fine full colour reproductions of J. D. Carrick's W.W. I paintings on the dust jacket. The same painting is also reproduced on the art paper frontispiece. Careful attention to additional information and corrections sent to the publishers following issue of the original impression, has enabled Harleyford to correct earlier errors, and we are especially pleased to see revised scale drawings in the Von Richthofen work. Internationally accepted as the finest publications on their subjects, these two books are indispensable to the ardent enthusiast of vintage aircraft, and we fancy that many purchasers of the first print will be seeking these new copies to make sure they have the very best available.

KeilKraft's 44 in. Gaucho, finished in blue and white, with D.C. Sabre 1.5 c.c. diesel, is a good practical contest design



Gaucho structure reveals anti-warp tail taper on the trailing edge and wingtip panels. Fin is solid sheet.

There is no denying that plastics are big business. Particular evidence of this came to us on the opening day of the Brighton Toy Fair, February 18th when Mr. Ehrmann, Managing Director of **Airfix Products** flew back from his four-week sales tour of South Africa for a few hours of the Brighton show, before departing once more for the U.S.A. It is good to know that British plastics are indeed holding their own in overseas markets, and this is also very true in the case of **Rosebud Kitmaster** who have firmly established their HO gauge railway kits in America. The new Kitmaster catalogue is an impressive parade of current models and future additions to their range including illustrations of locomotives for projected production as far ahead as November of this year. Already Kitmaster are issuing their first Corridor Coaches and although we realise this is strictly a non-aeromodelling item we do know that a very high proportion of our readers have equal interest in model railways and will appreciate the very fine value for money, price for the Corridor Coaches being only 6s. 6d. each.

Motorising kits for these plastic models are already available, but Kitmaster will be introducing their special electric Box Wagon in July, together with coach electric motor bogies with a 3-pole motor and worm driven double axles, the price to be 27s. 6d. for the motorised bogie and 35s. for the complete Box Wagon.

Ripmax have sent us samples of the first Semo nylon propellers which they are distributing in this country, sizes being 7 x 8, 3s. 6d., 8 x 6, 8 x 8, 3s. 9d., 9 x 4, 4s 1d. Among those to come will be a 10 x 4 with special appeal for radio controllers.

Top Left: the new nylon props distributed by Ripmax are neatly packaged and have tip flexibility. Below are the new Davies-Charlton fuel packs, the new mixtures are indeed potent and finely filtered. Makers have gone to a lot of trouble in finding best constituents in their formulae. In foreground is the Polystyrene 5½ x 3½ prop. for the Bantam which sells at 1s. 6d.

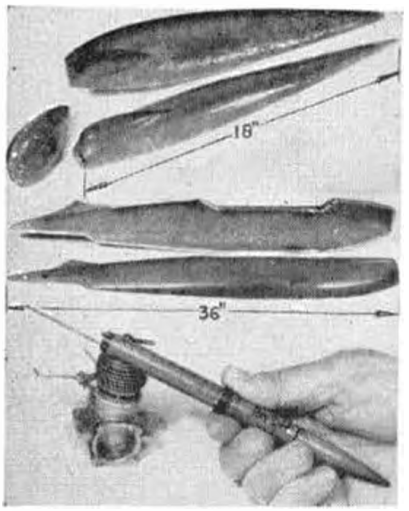
Another line to be distributed by Ripmax will be the Radio Control kits for the *Vagabond* and *Viking*. These models have already been extensively photographed by us in reports on the last two "King of the Belgians" European radio control championships. We have already commented on the very high standard of kitting in the Vagabond marketed in Sweden by Sven Trudson in fact, we rate it one of the finest examples of die-cutting and kit preparation to be found anywhere. This is a high wing 60 in. design for 2·5 - 3·5 c.c. whilst the Viking is a fascinating, low winger by Bergelund for a side-mounted 2·5 c.c.

Fuselages moulded in glass fibre have the special quality of being virtually indestructible. **W. P. Holland** is able to offer a nicely-shaped fuselage for radio control or sport flying, 36 inches long, split along the centreline, weighing 12-13 oz., for 45s. A further 10s. is required as a deposit on the crate in which the fuselage is despatched. In answer to popular demand Peter is also producing an 18 inch fuselage with applecheek engine cowls incorporated weight 3½-oz., and this should be very suitable for small stunt models, even team racers or free-flight at 15s. A further line are the spats which weigh 3½-oz. per pair at 7s. 6d. per pair, all can be seen in the photographs on this page, also a cheap, but quite efficient rev. indicator with an adjustable wire reed to indicate approximate r.p.m. Glass fibre mouldings are finished with an orange dye and require a little extra work in cleaning up for wing and tail seats, etc.

First **KeilKraft** free-flight power duration design since introduction of the ever-popular *Slicker* series and *Skylon* comes from the drawing board of International contest flyer Neville Willis. The simple lines of the design with all-sheet fuselage

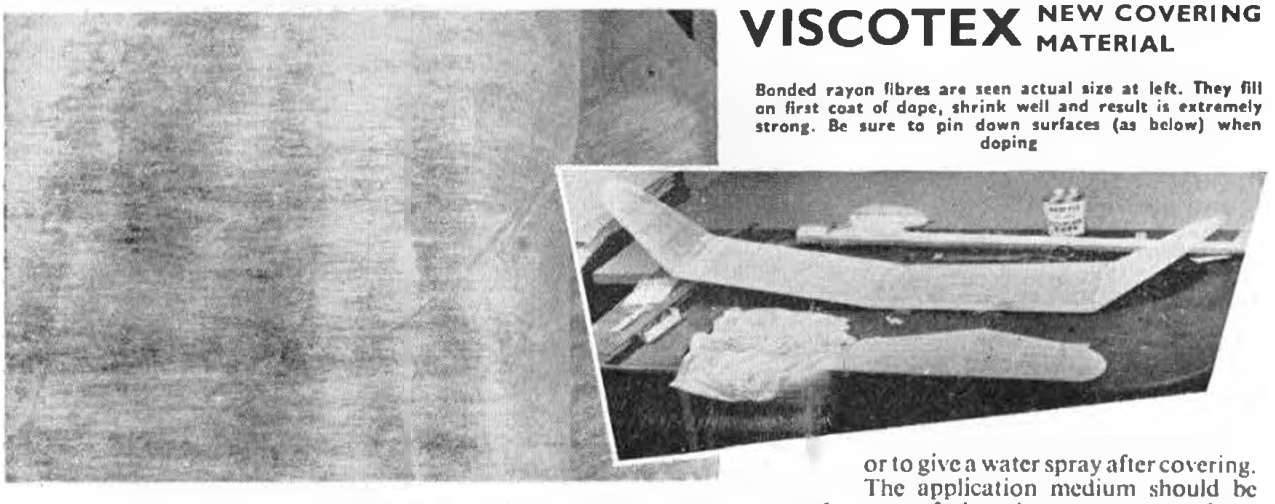
construction, parallel chord mainplane panels and two spar, flat bottom wing section allow the excellent die-cutting and pre-fabricating resources of the Keil factory to come into their own. Building the kit should provide no trouble for modellers of even limited experience, as plan and leaflet are amply informative to a very high standard. In fact the model can be built in a few evenings. Finished weight with the D.C. Sabre 1·5 c.c. in our test example was 15¾-oz.; undoped (covered) airframe was 10-oz. Our only deviation from *Gaucho* instructions was to move the engine forward one inch to the bearers to correct slight tail heaviness, and bring the centre of gravity in the correct location. KeilKraft are to be congratulated on a fine 21s. 6d. worth of power duration model which is bound to be popular for many years to come.

With the influx of the new cheaper glow plug ·8 c.c. engines, the model trade has a small problem on its hands in educating novices in the correct use of glow-plug ignition. **Davies-Charlton** have issued an informative leaflet concerning the operation of their *Bantam* for the inexperienced and we must say that they have covered just about every possibility that can occur. Their good advice on starting procedure is of course fully detailed in the leaflet "Getting the best out of your Bantam" which comes with every engine, but this trouble-shooting chart gives information on batteries, propellers, checking the glow, the fuel supply, and tells the operator how to control the engine for correct running. If you are having trouble with a D-C "Bantam" we suggest you write for the leaflet to the Isle-of-Man factory.



W. P. Holland products above are the wheel spat, top left; short fuselage at top, radio model fuselage halves in centre, and Revspot. R.P.M. indicator at bottom

VISCOTEX NEW COVERING MATERIAL



Bonded rayon fibres are seen actual size at left. They fill on first coat of dope, shrink well and result is extremely strong. Be sure to pin down surfaces (as below) when doping

MAN-MADE fibres have already established themselves in aeromodelling with widespread uses of Nylon, Terylene, Bri-lon and other fabrics for covering. The toughness of such fabrics is renowned—and many more modellers would use them more if only the price were a little lower.

Last November, K. Moore of the Foresters (Nottingham) M.F.C. informed us that he had come across a fine new material in the course of his business (Nottingham lads are all happily engaged in lingerie manufacture) and he thought the possibilities were specially bright for covering compound curves, (they should know all about *that*!). In due course we were able to obtain samples of three weights and conduct tests.

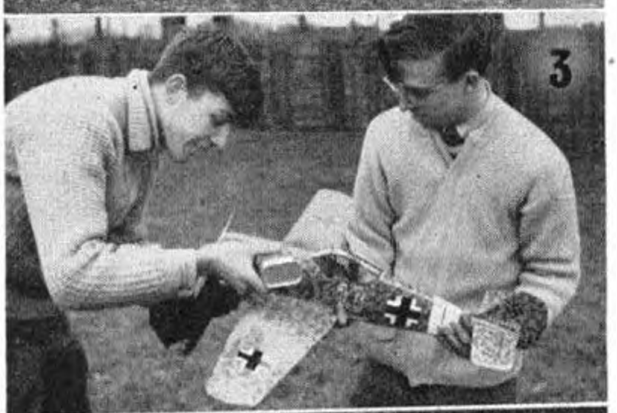
The material is known as VISCOTEX and is actually made of bonded fibres in Viscose, the fibres being rayon. Messrs. A. A. Hales have foreseen the applications of Viscotex and are distributing flat sheets measuring 25½ in. x 30 in. in white only, to retail at 1s. each.

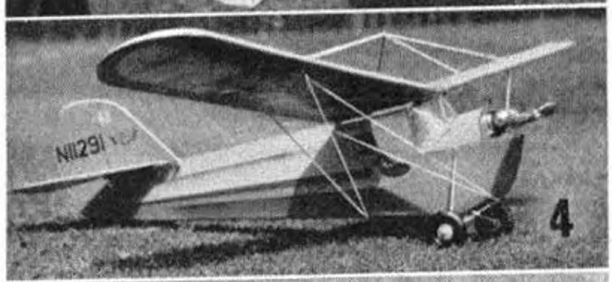
George Fuller of Messrs. A. A. Hales has conducted parallel tests to those done by ourselves and has come to the same conclusion in Viscotex we have something of practically the same strength as woven fabrics when doped but at fractional cost.

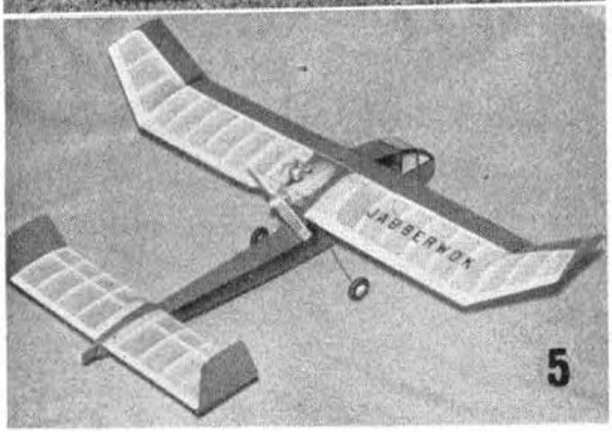
As far as weight is concerned, the manufacturers' figure is 1·25 oz. per sq. yd. of original material. We can bear this out and confirm that the additional weight when used to cover a model such as the *KeilKraft Gaucho* illustrated elsewhere in these pages, was within acceptable limits.

One of the greatest properties of this new material is its ability to shrink over compound curves. The rate of shrinkage is quite high and it is not at all necessary to apply wet or to give a water spray after covering. The application medium should be one of the photo pastes or tissue paste and we recommend that the outlines of the structure be given a preliminary coat of dope before the main body of the material.

First application of dope shrinks the fibres perfectly and subsequent coats seal the pores and give a fine smooth finish. In fact we flour-papered the surface between coats and obtained quite a sheen. Repeated coats of full strength dope are not to be advised as shrinkage continues. After an initial coat of dope as applied, one should use 50/50 thinners/dope coats. The material shrinks *along the length* of its fibres and this is a point which *must* be observed when covering a wing. It is to be particularly recommended for combat models and we might suggest that the A.P.S. *Unlimited* for example would be virtually indestructible if double covered with this inexpensive new material.







MODEL ★ ★ NEWS

"Who is Sylvia, what is she, where and what her dwelling?" Readers will have to excuse our quotation from the old song. A. J. Vidler of Wye in Kent tells us that this happens to be the name of the charming young lady holding his model of the Airspeed Ambassador in picture number **1**. Two E.D. Racer 2.46 diesels power this model of the high wing airliner which is to 1/24th scale, enlarged from the AEROMODELLER Plans Service scale drawing and built up with fuselage formers and ⅛th balsa planking. Wings are covered with 1/16th sheet over a ply spar and metal foil covering is used overall to represent the original BEA colour scheme. Novel cowlings are made from Thermos flask cups and the total weight is 3 lbs. 10 oz.

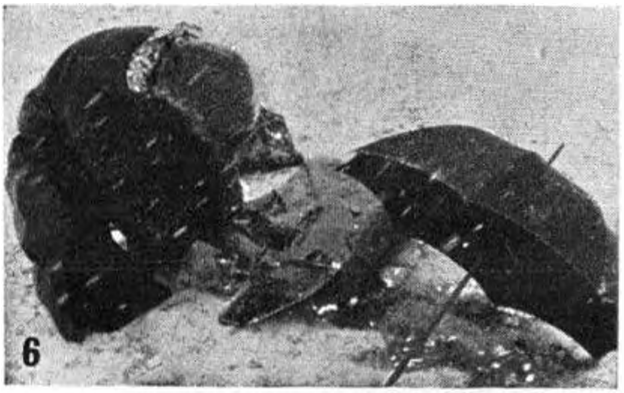
A Canard double delta rather like one of the unusual French jet fighters is seen in picture **2** and is the work of Roger Tripp of Buckhurst Hill, Essex. A pusher Elfin 249 diesel calls for a special hand-carved propeller and this was holding up the initial flights when Mr. Tripp sent us the photograph so we can give no report on the flying tests. Overall span of the rear wing is 22 in. fuselage, length 30 in. and the forward delta plane spans at 13 in. for those who wish to tackle a similar project.

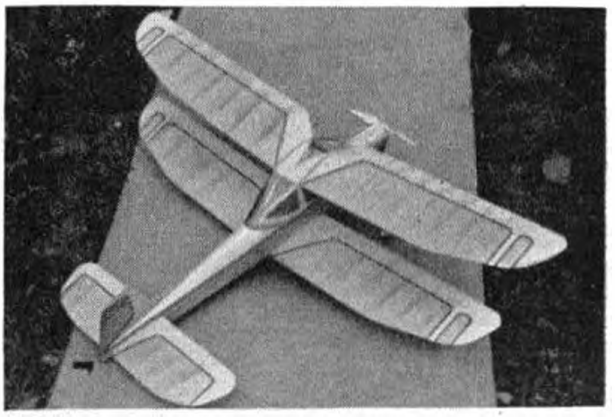
A typical club flying scene with well-made Veron Focke-Wulf 190 kit model by Keith Gates of Newcastle-upon-Tyne is seen in picture **3**. Powered by an Allen-Mercury 25 diesel the F-W 190 is being held by Mike Bruce and readers may be interested in the camouflage scheme applied to the model so effectively. Upper surfaces are light grey with dark grey mottling, the undersides are pale blue, with yellow nose and wingtips. In addition the spinner is yellow with a white spiral, exhausts are black and the prop and the fuselage are in red with white edging, the white band around the rear fuselage is outlined with a red stripe and white bombs are painted on the fin. Incidentally, these lads are all members of the Gosforth Saints M.A.C.

B. F. Creffield's Aeronca C-3 ultra-light in picture **4** is Cox ·020 Pee Wee powered and was made up from an American Berkeley kit with a total weight, including engine, of 7½ oz. Mr. Creffield was tempted to use this model as his first attempt at spraying following publication of our article in June 1958 issue and the result is apparently very satisfactory. Colours are orange with blue trim.

Next a refreshing own-design with good originality by G. W. Dodwell of Crawley in Sussex seen in picture **5**. Jabberwock has 42 in. wingspan, weighs 18 oz. and has a Frog 150 mounted as a pusher. Interesting point is that originally the model had a single fin but tended to develop a wallowing stall. Mr. Dodwell changed the twin fins to allow the vertical tail surface to escape the slipstream and the defect was immediately cured. Why don't we see more original designs these days?

Snow and cold weather are never enough to



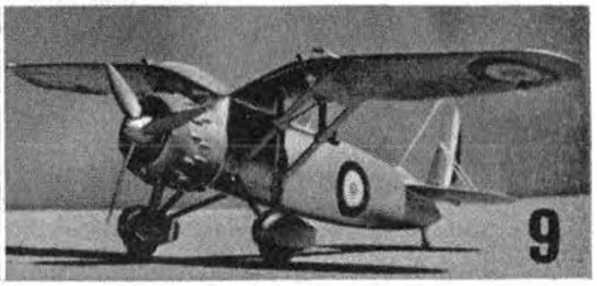


dampen the enthusiasm of the keenest modellers, in picture **6** Patrick Morton of Wellingborough is re-fuelling his A.P.S. *Unlimited* in the midst of a blizzard trying to keep things dry in the shelter of an umbrella. In the second photograph the assistant prepares to launch the model and we sympathise with him in his situation. Although the Allen-Mercury 25 *Unlimited* flew well despite the adverse conditions, operations were eventually abandoned because of crew fatigue, hunger and cold!

Flying over snow has its special advantages—provided it is not snowing at the time, initial test flights of a new model are most satisfactorily cushioned in the hardest of landings.

Natty colour scheme on the A.P.S. *Bi-play* in picture **7** is by K. S. Bates of Stamford, Lincs. Colours are actually light grey with Valspar lilac and cardinal red trim. Being in the R.A.F. Mr. Bates appreciates the portability of *Bi-play* which breaks down into small components for easy transport. An E.D. Bee drives an 8 in. x 5 in. prop.

Solid models carved from pine to 1/36th scale by J. H. Robinson of Randwick, New South Wales, Australia are seen below. The Spitfire Mk. VIII in picture **8** has a pilot to the same scale, detailed cockpit and is finished as a high altitude fighter, while elegant French Loire-Nieuport in picture **9** reminds us of the many interesting French subjects for modelling of the between-war years. Mr. Robinson turns the wheels, spinners, cowlings etc. for all his models and many scale enthusiasts will of course remember his fine drawing of the Art Chester Jeep racer which was featured in November 1959 issue.



KEILKRAFT REVISITED *(Continued from page 193)*

Production must always be matched by efficient sales and distribution, and in "Jimmie" Haddock, K-K have one of the most experienced Sales Managers in the model trade. Seven representatives tour the country to extend KeilKraft's goodwill and support their claim to the "Greatest name in kits", while in 21 overseas countries, officially appointed agents look after their provinces. In larger territories, such as Australia, distribution is divided among several agencies. Truly it is very big business, and all who know him will agree that it has been Eddie Keil's drive and foresight, with his brother Ronnie looking after production, that has made the family name a byeword in International aeromodelling. Nothing was ever too much trouble for Eddie in the past, and despite the heavy calls upon his time in these days, he will always drop everything to help someone in trouble. During our visit he took an Enya 29 from stock, then personally dismantled it to remove the conrod to replace a broken unit in a retailer's customers' engine. If you know another equally busy Managing Director, willing enough to spare his time *and* skills (not to mention the conrod-less engine he has left in stock) in the sake of good customer relations, then you too know a master of his trade who fully deserves all the success he and his company have attained over the years

NORTHERN AREA WINTER RALLY

RUFFORTH 17·1·60 — reported by Ron Firth

DESPITE heavy falls of snow during the week before the Rally, a poor weather forecast for the day, and the B.B.C. telling people not to travel, some 400 modellers turned up at Rufforth for the Northern Area Winter Rally—the first contest of the New Year. The competitors were pleasantly surprised to find almost ideal conditions with very little wind and good visibility and there were over 80 entries in the free flight events and a good entry for the Team Racing. The contests got off to a good start at 10.30 a.m. and entries were: Glider 26, Power 24, Rubber 15, PAA American Class 3, Chuck Glider 7 and R/C 5. Some of the keener modellers had travelled long distances and the organisers were pleased to see entries for Birmingham (Small Heath), London (Croydon and Surbiton) and for Manchester (Whitefield and E. Lancs.). With the NAAFI van in attendance the Comp. Sec. bringing his paraffin heater nobody got cold. The visiting experts didn't take away all the prizes, and honours were shared evenly amongst the representative areas as the results show. The Area system of having Clubs delegated to running the control table for 1 hour periods during the day worked well and members of the Teesside, Sheffield, Wakefield, Baildon and Halifax Clubs all played their part; whilst Wharfedale organised and ran the T/R events. S.M.A.E. Comp. Sec. Sam Messon assisted by Fl./Lt. Bancroft of R.A.F. Linton-on-Ouse kindly judged the Radio event. Thanks are due to Peter Hollis Area Comp. Sec. for the work he put in and to the Royal Air Force authorities who allowed use of the airfield.

Some excellent times were recorded in the F/F events and in Rubber a three man fly-off showed J.O'D (Maxie) to have 2 minutes to spare over his nearest rival Wisher (Croydon) who was flying a Hatschek Mulvihill Winner. In Power, Phil Stokoe (Wakefield) showed good form to win with his 4:45 fly-off but this could have been bettered by Young's "Amazoom" had he not been unfortunate enough to overrun by 3 seconds. A. Farrar (Wakefield) won PAA easily as did Stoker (Baildon) in Chuck Glider. Partridge (Croydon) led the field in Glider closely followed by Stoker. Radio was won by Cawthorne (York) by virtue of a good spot-landing in the Single Channel event. J.O'D's F.A.I. power model (Pendleton Fault Mk. 2) was a perfect example of a contest model and displayed good trim to win the "Selby and DMFC Concours Trophy" from Eric Coates' Puss Moth.

Team Racing was again a battle between the two Northern T/R Clubs Wharfedale and Thornaby Pathfinders.

RESULTS

Rubber
1 O'Donnell (Whitefield) 12:00 + 5:55
2 Wisher (Croydon) 12:00 + 3:34
3 Thorpe (Derby) 12:00 + 3:25

Glider
1 Partridge (Croydon) 8:35
2 Stoker (Baildon) 8:16
3 Tideswell (Baildon) 7:43

Power
1 Stokoe (Wakefield) 12:00 + 4:45
2 Young (Surbiton) 12:00
3 Garnett (E. Lancs.) 10:37

Chuck
1 Stoker (Baildon) 2:07
2 McNulty (Baildon) 1:35
3 Goodwin (Sheffield) 1:02

PAA
1 Farrar (Wakefield) 5:30
2 Firth (Sheffield) 1:20

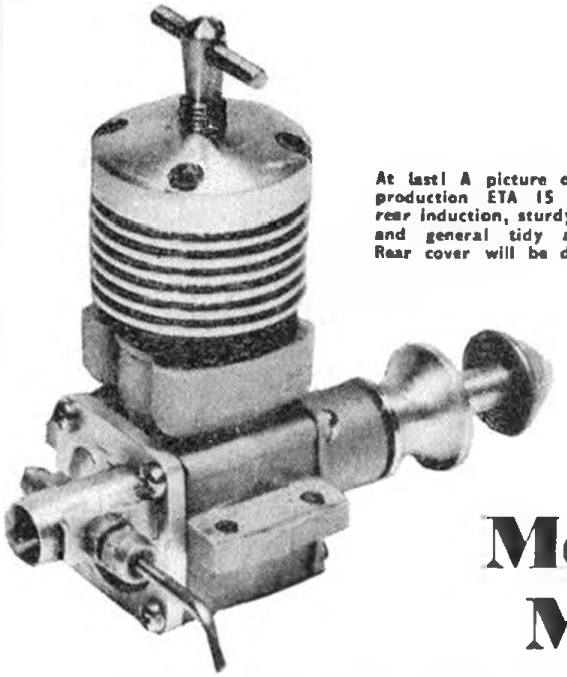
Radio
1 Cawthorne (York) 49 Pts.
2 Budding (York) 36 Pts.
3 Smith (Baildon) 5 Pts.

T/R 1A
1 Moulding (Wharfedale)
2 Dennison (Wharfedale)
3 Horton (Wharfedale)

FAI
1 Davy (Wharfedale) 6:11
2 Haley (Thornaby Pathfinders)
3 Wilstaff (Wharfedale)

Class B
1 Pasco (Thornaby Pathfinders) 8:44
2 Horton (Wharfedale)
3 Edwards (Wharfedale)

Left, Henry Tubbs of Baildon with his old reliable, but modified Red Swan — did not place. Below, Eric Coates could call on really authentic gen for his Blackburn Ripon (E.D. 2·45) as he's in Blackburn Aircraft. At right, Eric Coates' other scale model, a De Havilland Leopard Moth for Mills ·75 was 2nd in Concours. Bottom right, Open Power winner, Phil Stokoe of Wakefield, uses an Allen-Mercury 25



At last! A picture of the first production ETA 15 shows the rear induction, sturdy crankcase and general tidy appearance. Rear cover will be die-cast.

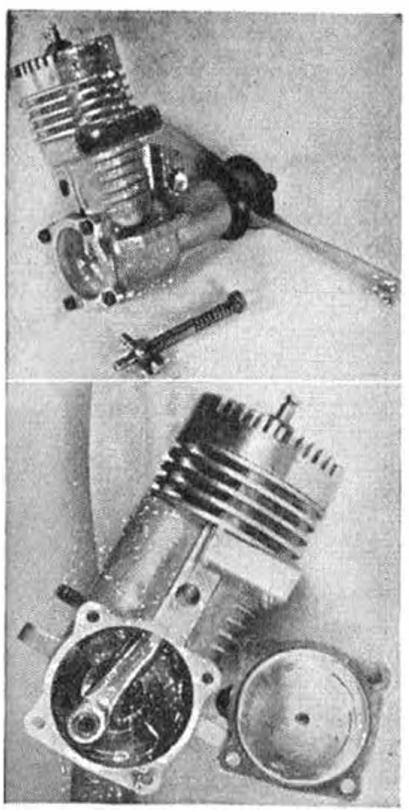
Motor Mart

NEW AMERICAN engines to come to light this month are the **Johnson** ·15 and the **O.K. Cub** ·024. No description is available for the former, but as the majority of their other capacity engines, 29, 33, and 35, have all followed the Orwick pattern it may well be another front-rotary 2·5 c.c. The O.K. ·38 c.c. glow plug engine will sell for the very low price of $3.95, and has an integral translucent nylon tank with reed valve induction. The platinum element glow plug is integral with a replaceable head and the engine is for radial mounting only.

Greatest interest in this country will be centred on Ken Bedford's latest product from **Eta Instruments Ltd.**, his long-awaited 2·5 c.c. racing diesel. This engine has been developed over the past year and prototypes exhaustively tested in team racers. Ken's attentive ear has been kept wide open to all advice, good and otherwise, offered by leading competitive modellers in this country and he set himself a very high task of producing an engine which incorporates all of the accepted modifications so that performance is of the highest possible order. To achieve this, the Eta 15 introduces what is virtually a revolutionary process in model aero engine production. The cylinder is *cast* by the investment moulding method in a special high grade steel by the most experienced company in Britain. Known to many as the lost wax process, this means of obtaining a cast cylinder has obvious advantages.

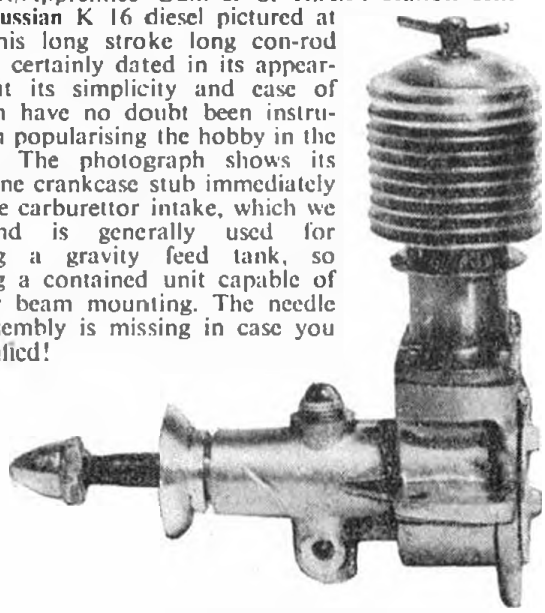
Consistency of production is assured and porting is no longer limited by machining capabilities, thus the transfer system on the 360 deg. porting for the Eta 15 has been shaped advantageously (with some degree of exhaust/transfer overlap) as on many hand-worked specially modified engines. The turned connecting rod in special high grade alloy has phosphor-bronze bushes at each end, and the rear induction timing disc is machined from hard-wearing Tufnol. The ¼-in. diameter shaft runs in double ball bearings, and flat top piston has an enclosed gudgeon pin to prevent end-rubbing and crankcase losses, while the mounting hole dimensions are sensibly disposed to make the motor interchangeable with other units of similar output, although the shorter front shaft is ¼-in. less than, say, the Oliver Tiger in length. Team racing tests have indicated good economy, together with the required exceptional performance from an engine of this calibre.

Noel Falconer has sent us a couple of his pictures for the **Fox** Custom 29X which was the result of a challenge to designer Duke Fox to produce the most powerful 29 available. Many experimental Fox engines have been made for speed work, utilising ballrace supported shafts, packed crankcases and high pressure fuel feed, and every Fox 29R was despatched with an offer of $100 to anyone producing a more powerful motor than the works unit. A few Fox Custom 29X motors were hand-built for $25 each and they include all "Mods" found advisable in the many experiments. These are incorporated by George Moir in Fox's special "Custom sales and service dept.". Crankcase, con-rod and backplate are highly polished. Intake is bored to 7/16ths. Shaft passage, crankpin and balance weight have a mirror finish and the exhaust port is opened. Noel Falconer's engine has a crankcase pressure tap and a surface injector. A rather improbable figure of 22,000 r.p.m. has been mentioned in connection with a 7 x 9 Tornado prop. and if such were possible, it would certainly bear out the claim that the Custom X is the most powerful 29.

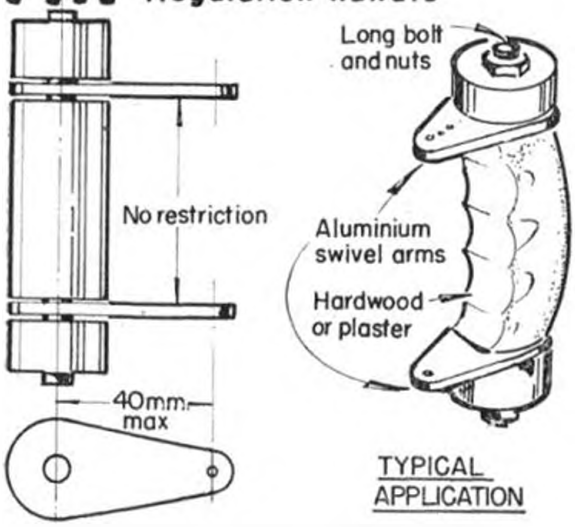


General view of the Fox Custom 29X showing pressure nipple, 29R needle, cut away fins, exhaust and intake and full depth exhaust porting in liner to match the crankcase port. Lower view shows the polished crankcase, backplate and connecting rod, chromed crankshaft, ground backplate mounting and pressure take-off in the centre of the backplate for tank pressurising. The engine is prepared by George Moir, American team race specialist

Aircraft/Apprentice Gulliver of R.A.F. Halton sent us his **Russian** K 16 diesel pictured at right. This long stroke long con-rod engine is certainly dated in its appearance, but its simplicity and ease of operation have no doubt been instrumental in popularising the hobby in the U.S.S.R. The photograph shows its rare engine crankcase stub immediately above the carburettor intake, which we understand is generally used for mounting a gravity feed tank, so providing a contained unit capable of radial or beam mounting. The needle valve assembly is missing in case you are mystified!

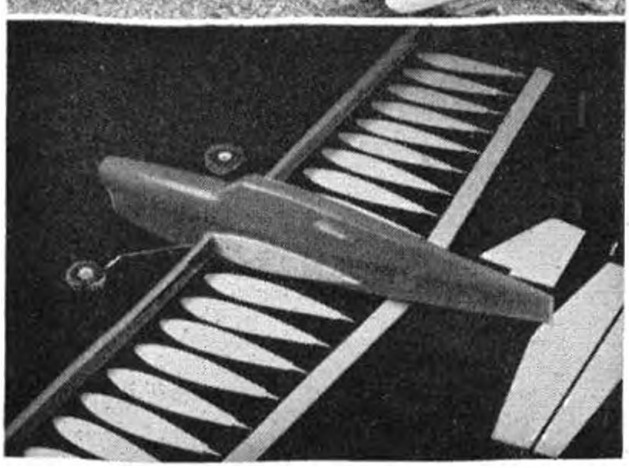


FAI Regulation handle



FOR SPEED AND TEAM RACE

Above, first published in "Model Avia" Belgian model magazine, now released by F.A.I., are details of the regulation handle with swivelling line connectors. Below: R. Bardou with his glass fibre models at sunny Menton. He is selling fuselages at 2,500 old francs and leading edges at 800 francs. Remainder of model is balsa. The glass fibre leading edge idea is very good, saves spars and offers very tough wing

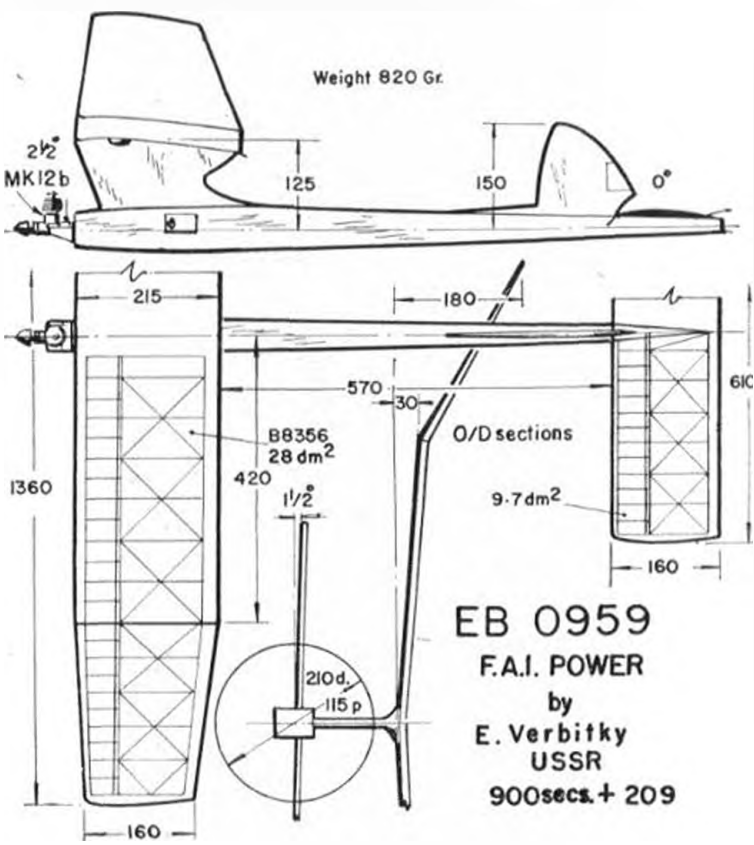


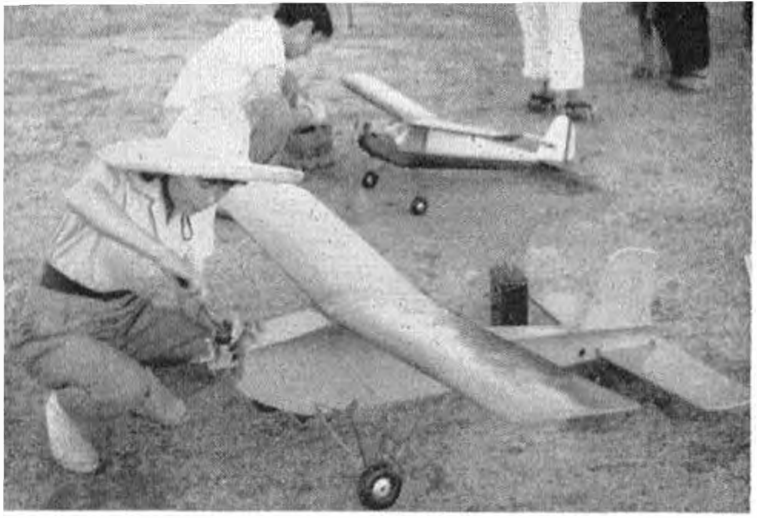
World News

NEXT in the series of overseas countries' National Championships is that in **South Africa,** to be held from April 15th to 18th at three centres in Boemfontein, Orange Free State. Free flight will be on Tempe Aerodrome, radio control on the Military grounds opposite and a fine control-line field is located in Springbok Park. Events are in the hands of the local model club, which has always been to the fore in South African C/L contests, and visitors are expected from the Rhodesias, South West Africa, and all the Union Provinces.

Associate membership of the Montreal MFC in **Canada** is swiftly embracing all the elite of the World's top modellers and not surprising too, considering the number of contest model 3-views and spicy gossip it issues once monthly for one dollar per annum. Three feet of solid ice covered Lake St. Louis in January, and the Canadians were able to enjoy wonderful flying weather under cloudless blue skies, with Tam Thompson's new A/2 knocking off maximums and wind varying from one to 5 m.p.h. Power programme for '60 in the MMFC

Above, Sapporo indoor model group in Japan with their "Soap Bubbles" made from February 1955 AEROMODELLER plan. Average time is between 4½-3½ minutes. Below: Russian F.A.I. power model was in the fly-off at last year's Kharkov International "Criterium of Europe"

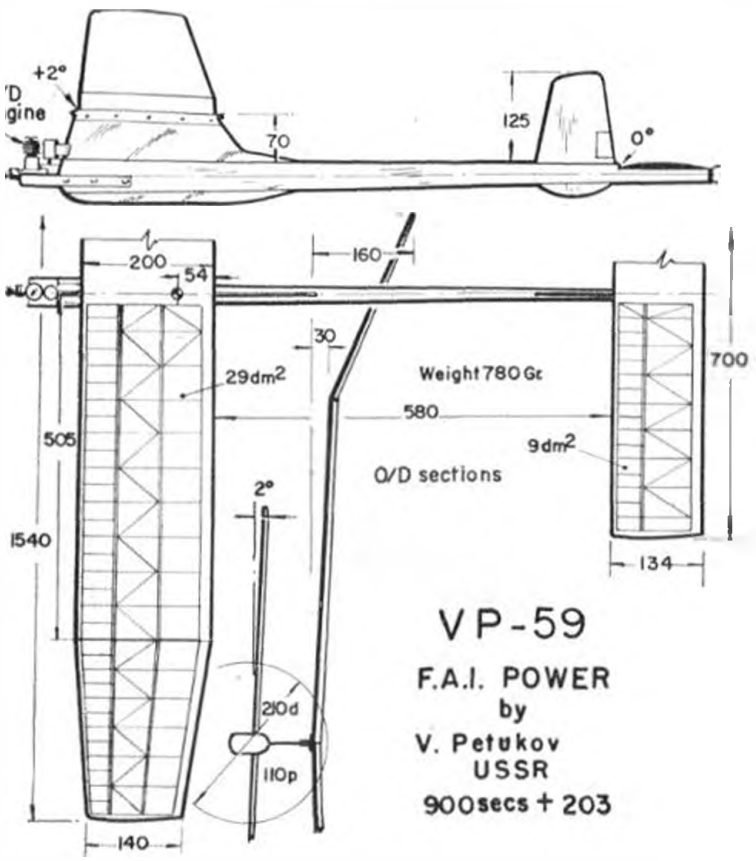




drifts farther away from pylon than before. Brian Hall will have a pylon mounted engine over a 72 in. low-wing, Don Mackenzie and Dick Foster use high thrustline on the wing mount. Incidentally, Foster's FAI approach will be with an ·09 (1.6 c.c.).

Over-ice flying is also the pleasure of Scandinavian modellers, particularly in **Finland** where their FAI Calendared event took place on February 14th at Helsinki. Perhaps this was too early in the year to expect visitors, and in any case the proximity of the Nordic Countries Championships on March 20th probably made their neighbours think twice on the subject of cost. It was also the first of five Finnish contests to decide the Free Flight Champs over the coming seasons flying. Temperature over the ice was 10 deg. Farenheit or around minus 12 deg. Centigrade, yet there were strong thermals and downdraughts in variable wind. All three FAI classes were won with perfect scores of 900 secs. with three in the A/2 fly-off out of an entry of 50. No less than 16 of the glider fliers had more than 820 secs.—and reference to the 1959 World Championships at Bourg-Leopold where conditions were warmer and may have been better, indicates that only the top 10 of the World's best had more than that duration, so the Finns certainly are hot in this class.

Above, Japanese radio enthusiast T. Oguro with 35 powered 3-channel model; in background, is a 15 size design, both use O.S. radio gear. Below: another Russian finalist at the Kharkov International showing similar design trend



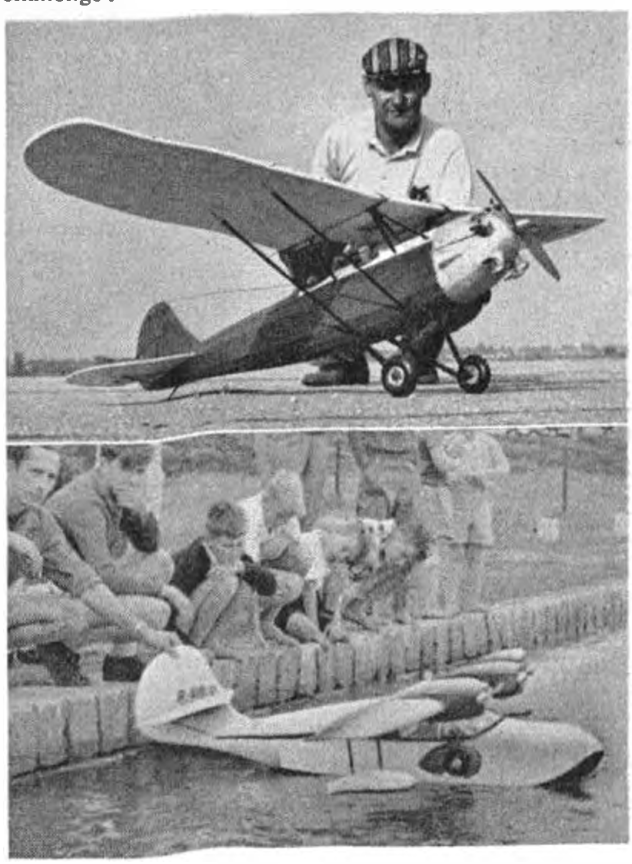
Above, Nguyen Quang-Ru in Vietnam with two all-balsa designs built from AEROMODELLER, at left is "Arabian Knight" and at right, the "Ebenezer" biplane. Below: William H. Kerr of Tulsa Oklahoma and his "Air Transport P-2 Meteor" with Super Tigre 2.5. Model is radio-controlled, 60 in. span with rudder and throttle control. At bottom: R. W. Cranmer of Durban, South Africa with his 90 in. plan "Skimmer", amphibian for land and water flying

A/2		Wakefield	
1. E. Ravea	900 + 180	1. P. Aalte	900 + 239
2. J. Malinen	900 + 155	2. P. Ella	900 + 213
3. S. Niemela	900 + 90	3. R. Hyvarinen	876
4. S. Takko	881		
5. M. Tahkapaa	874		

F.A.I. Power

1. I. Jokinen	900
2. S. Nurminen	894
3. S. Pimenoff	892

Finally, an appeal. The Academy of Model Aeronautics in the **U.S.A.** has offered to connect overseas model clubs with their American equivalents for the purpose of International Postal contests. We'd be pleased to forward club details, quoting membership, interests, ages and experience—so why not take up the challenge?

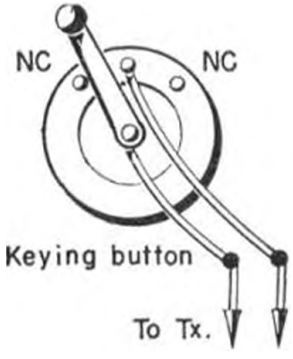


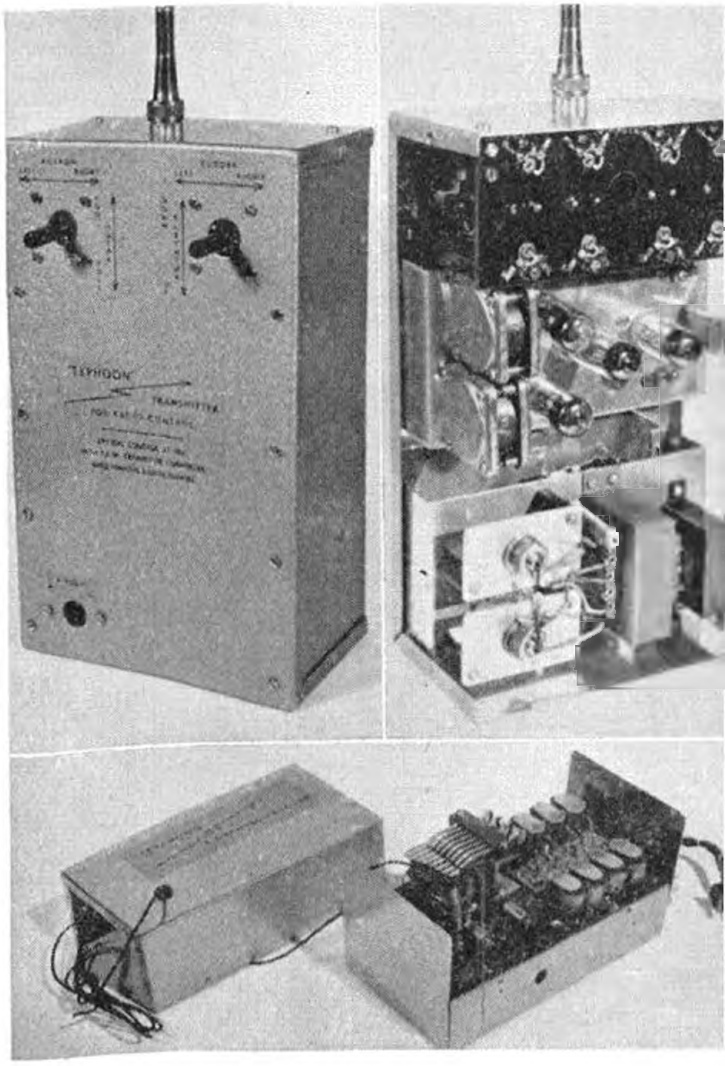
Over the Waves

COLONEL TAPLIN's cash prize offer of £75 to the first promulgated World Record holder using a Taplin Twin is certainly stimulating activity, if our correspondence and telephone are to be used as any guide. Although to date there are approximately fifteen aspirants, only two so far have nominated their attempts, which will be made just as soon as conditions permit. Charles Dance, whose model will be found illustrated in this month's Taplin advertisement on page 171, made one attempt on February 21st, leaving the road at Sidcup at 7.44 a.m. but the attempt was abandoned after some ten miles or so, by which time the model had climbed to a considerable height and effective engine speed control was not obtainable through the compound escapement control system before the model landed at Wrotham with three-quarters of its fuel left unconsumed. The nominated destination was Lympne. Mr. Adcock of Nottingham intends to fly his single/channel (Unitone) "Uproar" from Leicester to Bawtry, is well supported by his club mates and will be using an open Ford sports special to chase his fast model. We wish them luck in this endeavour to put Britain on the World Record listing and know that they have many difficulties to overcome, not the least being the congestion of British roads.

Ed Johnson sent us a remarkably simple idea for "Quick-Blip" control for those compound escapements and it is sketched at bottom left. All one needs is a 3-position rotary wave change switch which is only connected in the centre position. Rapid movement from either no contact position will give a momentary pulse across the keying button circuit, faster than any manual blip and according to Ed, works every time. Ed also sent us the latest information on the Dutch Typhoon gear illustrated below right, as manufactured by Veenhoven and intended for his pneumatic control system, although equally adaptable to servo operations. Receiver weight is 10-oz. complete and operates on 1.5 volt LT., 22½ volt HT, having a single valve with 13 m/A filament and two transistors. Receiver size is 2⅜ x 2¼ x 4⅝ and the matched transmitter which has two complete stable tone generators is keyed by two 4 position switches as can be seen in the photograph.

Tall story in the Kansas City R/C newsheet tells of Fred Warnock flying over snow and completing a low level loop with his *Esquire* below snow level it shed a wing and tail and left the fuselage to roll up into a large snowball! Maybe he should call it *Esquimo*!





Heading shows Chris Olsen checking his ETA Mk. VIc for low speed idling in "Uplift", a low wing variant of "Uproar" Hawkeyed readers may note that Chris has now changed over from his small hand-held gear to R.E.P. "Octone", which he will be using in the forthcoming season. Right, are internal and external views of the Dutch Typhoon transmitter and receiver for 8-channel simultaneous. Transmitter incorporates a transistorised converter to operate from a 6 volt storage battery and is the first multi channel to have this integral power converter

CLUB NEWS

All aboard for the Whitsun Nats! Crystal Palace M.A.C. leave no doubt as to their identity, and were one of many Dormobile-transported groups last year at Scampton

THE OLD PROBLEM of how to encourage club meeting activity in winter months is rearing its head again. Round-the-pole does not seem to hold popularity, most clubrooms do not have space for contest microfilmies and few clubs report a programme of lectures and talks. This lack of stimulation is really serious. Why don't we hear of those little tissue-covered free flighters for small space flying these days? Parlour flying, as our American friends term it, can be fascinating and though durations rarely beat the minute mark, they make a fine subject for evening events. Why not have a go? Span 10-in., prop. diameter 5-in., single surface wing covering and tough enough to fly into the wall. Prospects are limitless, you can have parlour monos, bipes, tripes, and quads — let's see *your* efforts.

London

ENFIELD D.M.A.C. Control-line Rally is to be held once again on Sunday, July 10th, at the north end of Enfield playing fields, beside the Great Cambridge Road, A10. Classes will be Team Racing A and B, Combat, Stunt, and Handicap Speed. Also permission is being applied for record attempts to be made. All contests to current S.M.A.E. rules.

DAGENHAM M.A.C.'s trend is now swinging to free flight, but this will not mean that combat boys will be less active in 1960. Club was represented last year at all rallies within 100 miles of home, so if you want to get around this season join, at Valance House, Becontree Avenue, Dagenham, meeting Thursday evenings, at 8 p.m.

COSMO A.M.C. hope to run their annual prizegiving and social on April 29th. In addition to static display they are including an R.T.P. demonstration using Pee Wee-powered models. On club nights a 20-question quiz is run for juniors, winner with the highest average getting an A.M.10 — lucky him!

HORNCHURCH M.A.C. have recently obtained a small hall for fortnightly club meetings. R.T.P. speed jobs for Jetex 50 are now all the rage, with a prize for the first to reach 50 m.p.h. Best yet is 49·8!

After a slight decline during the winter months of 1959 RICHMOND AND D. GREMLINS M.A.C. activities are now booming. Flying takes place every week-end at Richmond Park, with everything from combat to R.C. Club contests are held on the first Sunday in every month, the last contest, open glider, being won by Pete Green flying his *Walking Shoes* with 6 min. 42 sec. Still air conditions and fog kept the times low. Among members they have Michael Bentine, the "Goon" man. Prospective members should contact the Secretary, M. Turner, 76 Lambert Avenue, Barnes.

In its new clubroom CRYSTAL PALACE M.A.C. is continuing to flourish with new members coming every week (*Is* modelling on the up and up?). R.T.P. is still favourite for club nights and a hire purchase system has been arranged to help juniors to purchase new engines, etc. On inspection, overall standard of modelling was deplorably low, so a series of lectures have been arranged. These include talks on design and construction of F/F and C/L models and fundamentals of R/C. Class B combat has again been tried but abandoned as the mortality rate of large American glow motors is rather hard on the pocket — *why American* ? ? ? ? ?

South Midland

HIGH WYCOMBE Control-line Rally will take place on Sunday, May 1st, 1960, at R.A.F. Booker Airfield. Events will include "A" and "B" Team Race, combat and stunt. All are pre-entry (2s. 6d. should be sent to Mr. J. Elphick, 102 Suffield Road, High Wycombe, Bucks) with a stamped addressed envelope for return of flight-cards. Entries may have to be restricted, so get in early, last date being Friday, April 22nd.

R.A.F. HALTON M.A.C. interest is rising slowly, there being about 30 members, one-third of which attend regularly. However, they hope to make their presence known in the coming season, particularly in "outside" contests.

Special interest was provided at WATFORD (WAYFARERS) M.A.C. meeting held on January 27th, by member R. Lamb who gave a film show on model aircraft and a colour feature on last year's Farnborough Air Display. About 30 members attended and several R.T.P. rubber-powered models were put through their paces. J. Trinder's version obtaining 30 m.p.h. on 6-ft. line, due to limited space. Several new members were enlisted and Messrs. Cooper and Allan from neighbouring Mill Hill should strengthen the team racing section. Meetings are held on the last Wednesday of each month at the A.T.C. hut, Chalk Hill, Bushey.

Midlands

Some years ago THE FIVE TOWNS had a membership of close on a hundred, but the loss of use of the local airfield during the summer months resulted in the numbers dwindling to barely a dozen diehards. Of recent months, however, a revival has been evident and membership is now about thirty. Programme for this year has been arranged including visits to all contests within reasonable reach, and lectures and demonstrations have been arranged at club room in Newcastle, Staffs, on the Club's Tuesday night meetings. Interests cover a wide range of aeromodelling subjects, with a marked increase in radio control. One member is very well advanced with the building of a *full size* aircraft without any apparent detriment to his modelling activities. It need hardly be added — he's a bachelor. Anyone in the North Staffs area interested in joining or visiting the club would be most welcome. Hon. Sec.'s address is: D. Viggars, 8 Rangemore Terrace, Basford Park, Newcastle, Staffs.

KIDDERMINSTER AND D.F.C. has now passed through the stage of formation and after the initial surge of members find that they have over 40 people keen and flying every Sunday, interests being R/C, stunt and combat. Headquarters are at the "Model Mart", Park Butts, Kidderminster, where any new club members are welcome.

DERBY M.A.C. enter 1960 with great hopes after a bumper 1959, their 13th season, with all types of modelling flourishing. Members gained over 60 placings from 24 C/L and 15 F/F rallies. Club placed top in Midland Area C/L championships and top C/L and F/F club of North Midlands Association; also ran five combat comps. for various organisers. Ernie Thorpe was top club F/F man and Rob. Gibbard top C/L pilot. Estimated cost of combat flying was 50 *models*, 8 *spinner nuts*, 88 9x6 *nylon props*, 20 *gallons of fuel and* 1 *Austin Devon Saloon*. Travel to rallies tallied almost 2,000 miles, this by bike, car, train and coach. *Cor*!!!!! Local press reports of activities are helping strengthen the club. Following a highly successful display last year it is hoped to give one in aid of Refugee Funds in 1960. Juniors are attending a special series of lectures on all aeromodelling topics. It is hoped this will strengthen membership. At the club dinner, prizegiving was by founder member Jack Merriman who needed a new hand after presenting nearly 70 awards. Of note was a new idea of giving rosettes as momentoes of places gained during the season. Novel straight line indoor rubber K.O. speed contest was held at the dinner and proved successful, almost lethal!

North Western

Clwyd Slope Soaring Contest 1960 will be held on the western slopes of Moelffamau in North Wales on July 3rd, 1960, with four classes, namely Open, A/2 Radio and Junior; entry fees: Seniors two shillings and Juniors one shilling, pre-entry for the radio event will be required and should be made to C. R. Iiltness, 26 Raymond Street, Chester, by June 25th.

At their last club meeting WALLASEY M.A.C. were pleased to welcome five new members, all ex-Heswall club members. Unfortunately, they had to say good-bye to Chairman Norman Peacock who is moving to a new job in South Wales: here's wishing him luck and looking forward to seeing him at the large national comps. Club flying at the moment is restricted to monthly trips to a local 'drome as regular field is flooded. This club would be very interested to hear from the many unattached aeromodellers in Wirral area. Anyone interested in the club should contact either J. B. Hannary, Esq., 105 Rigby Drive, Greashy, or E. Davies, Esq., 27 Clarence Road, Wallasey, Cheshire.

CHEADLE D.M.A.S. has a plans library for the free use of all members. Modified *Eureka* is very popular. Membership is not as high as it has been and new members,

CLUB NEWS *(continued)*

whatever their age, interest or calibre, would be useful to back up the keen contest group. People interested should contact D. Powell, 8 Boundary Road, Cheadle, Cheshire, for particulars.

Christmas activities started earlier than usual when, at an Exhibition held at the local church fete in December a group of members, led by the notable Brian Faulkner, disappeared into the vestry to consume what turned out to be potent ginger wine; however, the Exhibition turned out to be a reasonable success. Power seems to have taken priority for the forthcoming season, as no less than 24 power jobs, including four F.A.I. models, are all rarin' to go. Power plants range from four Cox ·15s, seven Oliver Tigers, Fox 19's and numerous Enya 15's and 19's. Popular models are the *Eureka*, *Pendleton Fault* and a Vic Jays job built by P. Gibson. There is also a notable swing to radio with D. Brunt and E. Higham, both building *Guldator* after seeing A. Whittaker's model fly "as on rails" with rudder, up-elevator and E.D. Racer fitted with throttle control. The glide on his job is a dream to watch, or follow as certain members know full well after chasing a couple of miles only to lose sight as the job disappeared into low cloud to be found some four hours later without even a blemish. Cause was found to be faulty soldering — will some bods never learn ! ! !

South Western

EXMOUTH AND D.M.A.C. has fixed the 1960 Devon Rally for August 14th, the venue to be Woodbury Common, Near Exmouth, as in previous years. Classes will be F/F Power Rubber, and Glider. Combat and R/C, re-entry after the first flight only will be permitted. For the first time the Rally will have a free flight "Rally Champion" award. For anyone wishing for further details, please send S.A.E. to D. G. Baudet, Hon. Sec. Exmouth D.M.A.C., 80 Moorfield Road, Withycombe, Exmouth, Devon.

Northern

The Northern Area winter rally held at R.A.F. Rufforth, January 17th, was well attended by **WHARFEDALE M.A.C.** The day turned out to be very good for C/L and as a result three very interesting team races were concluded with results as in the report, page 208.

Negotiations are now taking place with the Air Ministry together with the S.M.A.E. with a view to renting, purchasing or otherwise obtaining a portion of one of the local ex-R.A.F. aerodromes. Given sufficient encouragement the club would gladly make provision for national and international events to be held on such a circuit should negotiations prove successful. Good show, Wharfedale — this is the first time we have heard of a C/L club making a move for a permanent flying site.

TEESIDE M.F.C. had a good start to the season at the indoor nationals, Manchester, where Geoff Parker did the best time of the meeting, at 10·02 in poor conditions (icy draughts). He also set a new British record (microfilm) with this time. Two members flying Class A microfilm broke the now non-existent record with flights of 6·55 and 7·15. It is a pity, they say, "That this reduction in the indoor record list was hurried through, as it will certainly take a lot of the interest out of indoor flying just when we are all trying so hard to kindle the spark." — Crikey ! ! ! What cheek ! Those records were proposed, circulated, deliberated and finally decided over the course of *eight* months — wakey wakey, Teeside — too late now to grumble when you had all that time to speak up !

Southern

CHICHESTER AND D.M.A.C., having recently completed its contest calendar, held its annual Dinner and Prizegiving on Saturday, January 30th. Fifty members and wives attended this function and saw Wing-Cmdr. Gutteridge (of Gutteridge Trophy fame) present the eight trophies to the prize-winners listed below.

Scale Trophy: R. Hackett (E.P.9).

Combat Trophy: N. Thair (A.P.S. Unlimited).

Team Race Trophy: R. Boxall (O.D).

Precision Power Trophy: J. Wingate (A.P.S. Jodel).

Open Sailplane Trophy: J. Barnes (Inchworm).

Open Rubber Trophy: J. Devenish (A.P.S. XI. 56B).

Junior Contest Shield: N. Gibbons (age 11).

Victor Ludorum Trophy: R. Hackett.

There is a growing interest in radio control in **TUNBRIDGE WELLS M.A.C.** Three club members have R/C models on the board from the C/L point of view A.P.S. *Skifflers* and *Razor Blades* are very popular.

S.M.A.E. Contests

March 20th	
K.M.A.A. Cup (F.A.I. Glider Elim.)	*Area Centralised*
Gutteridge Trophy (F.A.I. Rubber)	*Area Centralised*
April 10th	
Astral Trophy (F.A.I. Power)	*Area Centralised*
S.M.A.E. Cup (F.A.I. Glider Elim.)	*Area Centralised*
Women's Cup (U/R Rubber-Glider)	*Area Centralised*
Jetex Trophy	*Area Centralised*
May 1st	
Halfax Trophy (F.A.I. Power)	*Area Centralised*
Weston Cup (F.A.I. Rubber)	*Area Centralised*
May 21st/22nd	
FIRST F.A.I. CONTROL LINE TRIALS	*Centralised*
F.A.I. RADIO CONTROL TRIALS	*Centralised*

South Eastern

The Area announces its annual South Coast Gala for September 25th, venue is to be announced later — not too later please !

EAST GRINSTEAD M.F.C. made a successful visit to the local hospital just after Christmas, and gave a flying display which was watched from the wards, after which they were entertained to a very nice tea by the hospital and then visited the children's ward and distributed some small gifts.

Most of **ASHFORD M.A.C.** members have now come out of winter hibernation, even Eric Sawyer, who is well known for his bi-annual visits to the flying field. Interest amongst the junior members is mainly centred around combat and stunt and one and all are eagerly awaiting the appearance of the "Bernie Randall" stunt model. Club is at present mainly interested in C/L but any aeromodellers in the district will be welcome; details of membership obtainable from the local model shop.

At the **SOUTHERN CROSS A.C.** clubroom the dark winter evenings were brightened by entertaining sessions with still and cine projectors, a tape recorder and aeromodelling discussions. After the winter highlight — the club dinner — on March 5th, they wonder how many folks will be in a fit state to fly in the Pilcher on the next day. Anyone, of any age, wishing to join in the club's varied activities should contact G. K. Gates, 45 Boundary Road, Hove 3. A recruiting drive begins in mid-March with posters, window displays, approaches to schools and press coverage — and we wish them success in their endeavours.

East Anglian

A number of lads from **ANGLIA M.F.C.** went to Debden on January 10th for the area winter rally. Although times put up were high, nobody placed. The C/L section is currently building combat wings for 19's which are *hoped* to be better than any Oliver-powered model.

New meeting place for **IPSWICH M.A.C.** on Tuesday evenings 7.30 - 9.30 p.m. is Royal William Hotel, opposite Rolladrome, London Road. Non-members, junior and senior, invited; all interests welcomed. Three old club members from the 1950 - 52 era have re-joined in the last few months. Peter Wyatt (pleased to see you back in the fold, Pete) among them. So maybe Ipswich will start to creep up the contest lists again in the next season or so.

Ireland

On Saturday, January 30th, 1960, **LARNE M.F.C.** held a stunt comp. The event was run on S.M.A.E. rules. Bad weather did not prevent anyone making the best of the conditions. L. Blair (Larne) was the winner, with M. Doyle (Belfast) and W. Blair (Larne) taking second and third places respectively. About 20 members of the Belfast M.F.C. were present, although not all flew.

Wales

An excellent A.G.M. was held by the **CARDIFF M.A.C.** on January 15th. Membership is increasing and hopes are high for the coming season. Competition on January 24th was attended by only three members. Wind and rain daunted most — but maybe better weather will see more in the field in future.

Scotland

During the last few months **GLASGOW M.A.C.**'s winter indoor season has been getting well under way. One competition has been held, of two rounds for rubber-powered R.T.P. models, consisting of six flights each round per night, the best three flights counting each time. The total for the two rounds was then taken and winner received 10s. prize. The total time for six flights was 4 min. 51 sec. Models have to weigh over 1 oz. complete and have to be from a kit.

THE CLUBMAN.

Secretarial Changes

DUNFERMLINE M.A.C.
A. Erskine, 36 Victoria Street, Dunfermline, Fife, Scotland.

HARLOW M.A.C.
Mrs. S. A. Horton, 162 Pennymead, Harlow, Essex.

PAISLEY M.F.C.
T. Lawrie, 19 Fergushe Park Crescent, Paisley, Scotland.

CAMBRIDGE M.A.C.
R. Blake, 11 Roland Close, Arbury Road, Cambridge.

DE HAVILLAND (HATFIELD) M.A.C.
C. A. Ward, 10 Meadow Croft, Hatfield, Herts.

NORTHAMPTON M.A.C.
J. Parkinson, 85 Highfield Road, Rushden, Northants.

DAGENHAM M.A.C.
P. Pulfreman, 27 Bell Farm Avenue, Dagenham, Essex.

Change of Headquarters

HARLOW M.A.C.
Toc H, First Avenue, Harlow, Essex.

Pen Pals

Pen Pals are required by the following:

A. Hofton, 3 Highfield Road, West Worthing, Sussex, aged 15. Interests: F/F, C/L. Would prefer a German pal.

Safdar Qureshi, 59 North Road, Risalpur, West Pakistan (designer of "Paragon"). Interests: F/F, Power.

F. Baxter, 10 Chenhall Crescent, Traralgon, Victoria, Australia. Interests: F/F, Stunt, C/L.

H. L. Hooper, 104 Oak Street, S.W., Vienna, Virginia, U.S.A., wishes to correspond with someone in the mid-thirties interested in W.W.I and sport biplanes. Swap engines, plans, etc.

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Merco 29 & 35 Multispeed	£7/12/6	Cox R.R.1 (049)	£3/11/3	Eta 29	£7/1/11	Enya 35	£7/9/6
Fox 09	£2/5/6	Cox Space Hopper	£4/3/3	Eta 2.47 diesel	£5/19/11	Enya 35 R/C	£8/3/6
Fox 19	£6/0/0	Cox Thermal Hopper	£4/5/2	Drabant 2.47	£6/7/2	OS Max 29	£6/10/6
Fox 19 R/C	£9/14/8	Cox Sportsman	£4/15/0	Rivers 2.49	£6/5/8	OS Max 35	£6/10/0
Fox 29	£8/5/0	Cox Olympic	£7/13/6	Rivers 3.49	£6/5/8	OS Max 35 R/C	£8/15/0
Fox 35 Rocket	£5/10/2	Super Tigre G.20	£6/19/6	Taplin Twin 7 A/C	£8/12/0	AM 049 (with out starter)	£1/14/3
Fox 35 Stunt	£8/5/0	Cox Babe Bee	£2/11/3	Taplin Twin 7 W/C	£9/18/0	AM 10	£2/16/8
Fox 35 Combat	£9/5/6			Enya 15D	£6/2/6	AM 15	£2/17/10
K & B 35 R/C	£10/4/9			Enya 15 glow	£4/1/7	AM 25	£3/6/5
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(Continued on page 224)

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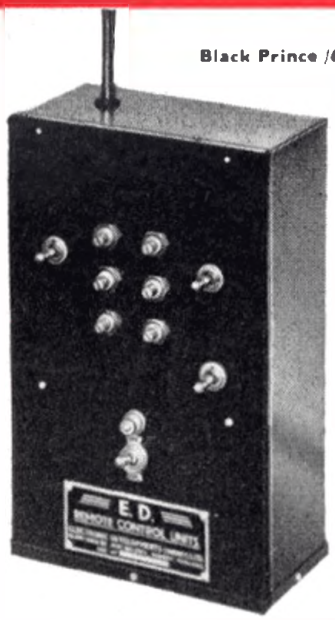

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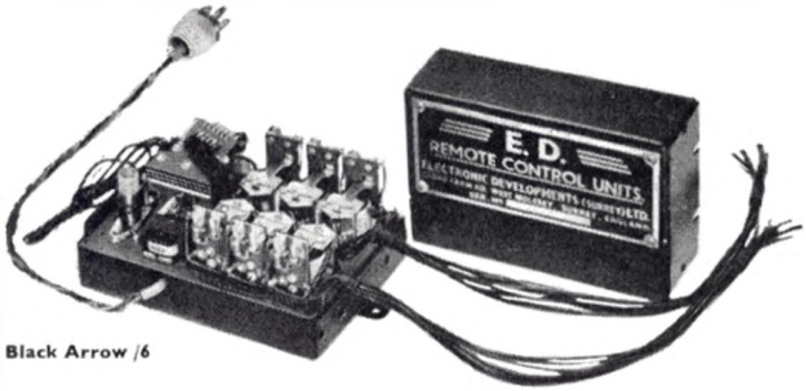

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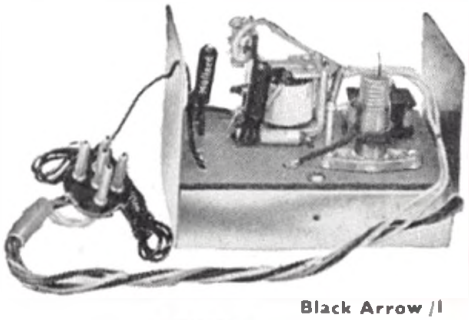

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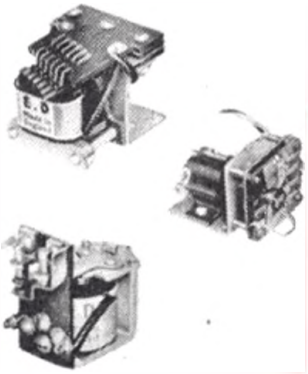

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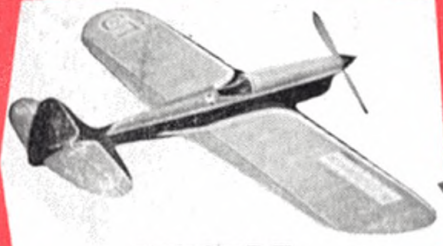

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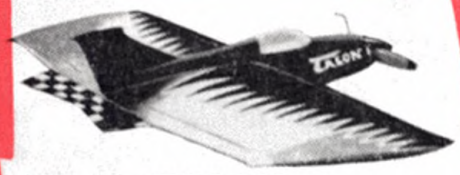

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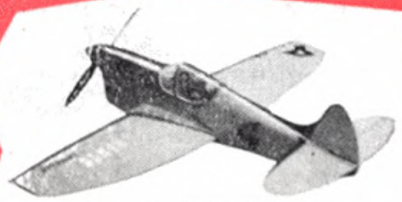

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