# AEROMODELLER

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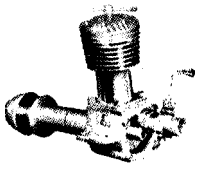
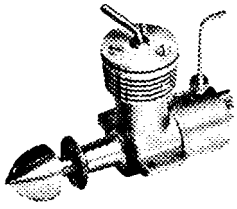
- "Hopit" High spread, short coupled super stunt job by Eric Higlett
- "Aerials" The real low-down on R.C. Aerial problems by leading radio expert F. C. Judd
- Biplane design fully covered in this month's "It's Designed For You"

MARCH 1951 1/6

# PRODUCTS E.D. ACCESSORIES & SPARES



E.D. 3·46 MK. IV



E.D. 1 c.c. MK. I

## E.D. DIESEL ENGINES

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|---|---|
| E.D. Mk. I "Bee" 1 c.c. Diesel Engine | £2 7 6* |
| E.D. Mk. II 2 c.c. Diesel Engine | £2 15 0* |
| E.D. 2 c.c. Competition Special Diesel Engine | £2 17 6* |
| E.C. Mk. III 2·49 c.c. Diesel Engine | £3 5 0* |
| E.D. Mk. III (Series 2) 2·46 c.c. Racing Engine | £3 12 6* |
| E.C. Mk. IV 3·46 c.c. Diesel Engine | £3 12 6* |

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| E.D. Mk. III "Miniature" Radio Control Unit (complete, less batteries) | £7 19 6 |
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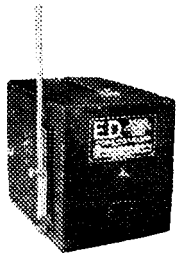
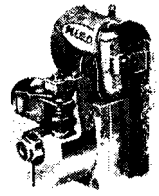
| E.D. Mk. III Receiver plus 4-pin Battery Socket and Plug, 2-pin Phone Socket and Plug, Potentiometer and On/Off Switch | £3 0 0 |
| E.D. Mk. III Escapement | 18 6 |
| E.D. Mk. I Transmitter and Aerial | £4 17 6 |
| E.D. Mk. I Receiver | £7 15 0 |
| E.D. Mk. I Escapement (clockwork) | £2 7 6 |
| E.D. Special Miniature Hand Transmitter | £5 0 0 |



E.D. TRANSMITTER



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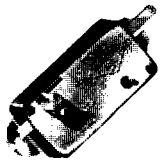
E.D. FUELS



E.D. TIMERS

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|---|---|
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| E.D. "Challenger" Hydroplane Kit Set | £2 2 6 |
| E.D. "Aerocar" Kit Set | £2 2 6 |
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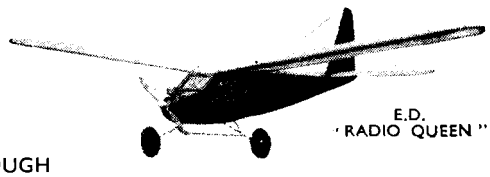
| E.D. Hydulignum Propellers, 8" dia. × 4" pitch, Control | 5/–* |
| E.D. Hydulignum Propellers, 9" dia. × 9" pitch, Free Flight | 5/7½* |
| E.D. Hydulignum Propellers, 10" dia. × 5" pitch, Control | 5/7½* |

** Prices marked thus include Purchase Tax.*

CHALLENGER "HYDROPLANE



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# NATIONAL GUILD OF MODELLERS MEMBERSHIP APPLICATION FORM

## Allen House, Newarke Street, Leicester.

I hereby make application for membership/renewal of membership to the Guild under the section/s noted below and agree to operate my model/s at all times with due care and regard to others.

REGISTERED No.

For office use only.

*Surname*..... *Christian Names*.....

*Address* .....

.....

**Please use BLOCK Letters** .....

| | | Premium |
|---|---|---|
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| Model No. 3..... | Model No. 4..... | |
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| *Total annual premium/s at the rate of 2/6 per £2 value of model/s* | | : : |
| **Section C.** FIRE, THEFT, ACCIDENTAL DAMAGE and THIRD PARTY LIABILITY (Exhibitions and Models in Transit) | | |
| Please insure the model/s listed during Exhibition, and during transit to and from the venue notified, for the period of one calendar month commencing.....19..... | | |
| .....models up to £10 in value. | *Monthly premium: 4/– per model* | |
| .....models up to £20 in value. | *Monthly premium: 8/– per model* | : : |
| **Section D.** FIRE, THEFT, ACCIDENTAL DAMAGE, THIRD PARTY LIABILITY or LOSS (Exhibition, Demonstration, or Private Flying Abroad) | | |
| Please insure the model/s listed for the purpose/s of Exhibition, demonstration, competition or private flying whilst in my possession in Europe and Eire (with the exception of the Russian controlled zones of Germany and Austria; Poland; Czechoslovakia; Jugoslavia; Albania; Roumania; Bulgaria; Greece; and Soviet Russia) for the period of one calendar month commencing.....19..... | | : : |
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| .....model..... | *Monthly premium:* 4/– *per model (up to £10 in value)* 8/– *per model (up to £20 in value)* | : : |
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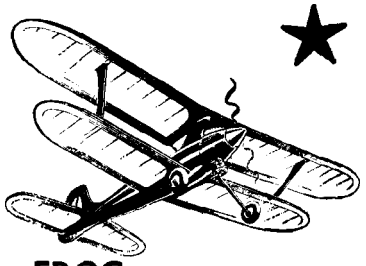
NOTE.—Details of the models to be insured under Sections B, C, & D must be attached. Membership is restricted to persons normally resident in Great Britain, Northern Ireland, Isle of Man, and the Channel Islands.



## FROG FIREFLY

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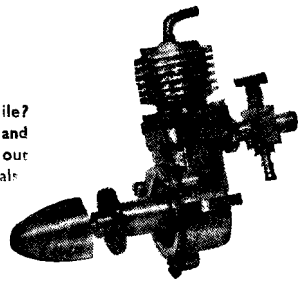
**35/11**



Have you ever been convinced that small engine operation was worthwhile? You will be if you own a "Moth", and no mistake. It weighs 2 ozs. and turns a 7×4 prop over at 8,500 and then asks for more. It won't wear out in 5 minutes, either—a phosphor bronze bearing plus first-grade materials takes care of that.

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| Elfin 2·49 c.c. | £3 10 0 |
| Yulon "29" | £3 19 6 |
| Yulon "49" | £4 19 6 |
| Mills ·75 c.c. | £3 0 9 |
| Mills 1·3 c.c. | £4 11 1 |
| E.D. Bee | £2 7 6 |
| E.D. Mk. IV | £3 12 6 |

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| Halfax Albatross | 25/- |

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# AEROMODELLER

INCORPORATING "THE MODEL AEROPLANE CONSTRUCTOR"

VOLUME XVI
NUMBER 182
MARCH 1951

*"Covers the World of Aeromodelling"*

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Published monthly on the 15th of the previous month by the Proprietors: THE MODEL AERONAUTICAL PRESS LTD., Allen House, Newarke Street, Leicester.

Subscription rate 21/- per annum prepaid (including Christmas Double Number).

## Contents



**Advertisement Office:**
THE AERODROME, BILLINGTON ROAD, STANBRIDGE, NR. LEIGHTON BUZZARD, BEDFORDSHIRE. Tel.: EATON BRAY 246

**Editorial Office:**
ALLEN HOUSE, NEWARKE STREET, LEICESTER. Tel.: LEICESTER 65322

ONCE upon a time, as all good fairy stories should start, it was possible for any aeromodeller to pick up his model and make straight for the nearest open space, be it park, common or Farmer Giles' field, and there enjoy himself for as long as he pleased, limited only by the number of casual by-standers and helpful small boys, whose enquiries and assistance might ultimately lead him to seek some less frequented area.

Those days it would seem have gone for ever, except in very remote districts where law and order is still administered in the curious old-fashioned way of live and let live. Our modern aeromodeller must be something of a local politician, and pause on the way to his usual flying field, to read the byelaws and see if, by chance, he is now forbidden to enjoy his hobby, whilst tennis players, cricketers and footballers may still sport unharried by Bumbledom.

It is a pity that we must so often refer to the growing prohibition of model flying in municipally controlled open spaces. We should be the first to admit that the old entirely uncontrolled attitude to our activities might lead to harm befalling non-aeromodelling passers-by and in particular the very young. That view is also held by the S.M.A.E. who were amongst those called upon to advise the Home Office on their model byelaws for the control—control mark you, not prohibition—of model flying in areas under local authorities administration. But far too many councils still continue to read into these model byelaws a need to stop flying altogether.

Now what is the poor harassed aeromodeller to do ? If he is a club member he may hope with some confidence that by collective effort the group will be able to find some alternative flying field where they will at least be tolerated if not welcomed. His contest flying is at any rate covered by the activities of his Area Council who will certainly be arranging one or more area rallies on some friendly aerodrome.

But this covers only perhaps a quarter of the flying enthusiasts in this country. What can the many lone hands do about it ?

We can hardly claim to have foreseen the present state of affairs when in 1944 our Managing Editor arranged the purchase of Eaton Bray Sportsdrome, to develop its 75 acres as a centrally placed flying field for the exclusive use of model flyers, and all concerned with working models.

We are happy to say that this splendid site is now available to our readers—when our season opens at Easter the whole area will be free of agricultural wire and other hazards, and our doors open at all times to welcome aeromodellers. There is adequate sleeping accommodation, full catering, showers, and all the other needs of the modeller away from home.

May we therefore repeat in all sincerity the slogan coined in hope some years ago : " See you at Eaton Bray ".

## *Cover Photograph . . . . .*

***Taken at the first contest of the year, the Bill White Cup, this wintry contest scene shows L. Ranson, the poetic aeromodeller, about to launch his F.A.I. rubber job. The timekeeper appears well dressed to withstand the chilly breeze ; but his attention seems to have wandered from L. Ranson's model! The event is reported on page 155***


## Insurance

WE apologise at the outset to those readers who take exception to our continually flogging the model aircraft insurance issue, but we view this requirement with such gravity that we feel sure constant reference is justified.

In spite of the efforts of the N.G.M. and S.M.A.E. (via its domestic insurance scheme), the numbers of insured members registered make it obvious that a considerable number of active aeromodellers in this country are flying their models with no protection to bystanders or, what is more important from a selfish viewpoint, protecting themselves against possible third party claims from members of the general public. We fail utterly to appreciate the viewpoint of those who do not undertake such commonsense precautions, still less so in view of the fact that the cost involved is so nominal.

However rosy may be our views on the great hobby of aeromodelling there is no denying the fact that, with the possible exception (?) of radio controlled models, once a model has left the launcher's hands he has no control whatsoever over the machine. This would be all right if one could be assured that the flyer was operating all by himself in the midst of a vast area, but we know full well that this is very rarely the case. With the performance of present-day machines the incidence of a fly-away is very prevalent and nobody can indicate where a model will land and what will be the conditions under which the landing takes place.

Our Claims Department shows that (fortunately) the incidence of damage to persons or property is comparatively small BUT—and that " but " cannot be too big—you never know when the odd serious accident will occur, and it is solely for this reason that insurance is such a necessity.

Further, we know full well that a number of members who take out insurance to enable them to participate in contests during the normal flying season allow their cover to lapse during the winter months. This would be all right if we could be assured that they were not flying during this period, but this we know not to be the case, and we would point out to these defaulters that the possibility of a claim being made against them is just as liable to occur during the " off " season as during the busy contest months.

We therefore urge everybody in their own interests to ensure that they and the general public are fully protected against any accidents arising from their flying.

## Ho Hum ! !

A news cutting recently received from Iran gives the comforting information that we aeromodellers in the Tight Little Isle might as well pack up the game and take to knitting (wind) socks.

Mr. G. C. Hughes, who hails from Margate and has been in Persia since 1945, told a local reporter that " Adaban is streets ahead of the U.K. in 'plane modelling. We are so advanced here that when I went home recently I was barred from flying my models in competitions because they were too good ". Further, he has a jet job that has an " estimated speed of 160 m.p.h. He is having a little engine trouble at the moment ".

Well—it seems we have let the best modeller slip through our widely spaced fingers, for surely all we need to do to bring the Wakefield and other trophies to this country is to secure the " extradition " of Mr. Hughes and send him around the world as a one-man British Team !

We would be interested to know just what " opposition " Mr. Hughes met when he was home on leave, for we must admit his is a new name in aeromodelling circles—and we have yet to learn of any modeller barred because he was " too good ". Or is it that there are no class modellers in or around Margate ?

We can only say in conclusion, and in the words of the immortal bard of " Take it from Here "—" Stop wasting your talents on the desert air, Mr. Hughes, and come 'ome to the Old Country. We sure need you ".

## Miles v. Kilometres

Those interested in control-line Speed models—and they are many—will be interested in the new minimum line lengths and number of laps for all future contests, including attacks on National and International Records. Modified to fall into line with the F.A.I. International requirements, the details are :—

| Class | | *Minimum line lengths* | *Number of laps per kilometre* |
|---|---|---|---|
| I | (00–1·5 c.c.) | 11·368 m. (37·296 ft.) | 14 |
| II | (1·51–2·5 c.c.) | 13·263 m. (43·513 ft.) | 12 |
| III | (2·51–3·5 c.c.) | | |
| IV | (3·51–5 c.c.) | 15·915 m. (52·214 ft.) | 10 |
| V | (5·01–8·5 c.c.) | | |
| VI | (8·51–15 c.c.) | 19·894 m. (65·268 ft.) | 8 |
| VII | (Jet) | | |

It is only commonsense to bring the British regulations into line like this, for a study of the International speed records shows that in nearly all classes the existing British records are in advance of the International grades, but as the latter speeds must be set up over a minimum distance of one kilometre, it has not been possible to submit claims to the F.A.I. It is to be hoped that some effort will now be made to bring the name of Great Britain into the list of official world records.

## Time Gentlemen—Please !

To all those harassed club secretaries looking for a good turn to enliven the proceedings at their annual club dinner or other function, we heartily recommend the services of the West Essex " Singing Waiters ". (Advert.) Ranged behind a most imposing fringe of face fungus, the three culprits rend(er)ed an assortment of Victorian pub classics with great gusto, and kept a somewhat blasé audience in tucks. Full marks to " Stoo " and Co.

## R/C Team Work

In two of the four Radio-Control contests planned for the 1951 season, teamwork will play a very important part, and we look forward to seeing some slick flying combined with a minimum waste of time on the ground.

For the AEROMODELLER International Radio-Control Trophy at Whitsun and the S.M.A.E. Radio-Control event at the 1951 Nationals, competitors will be required to fly a two-part flight pattern, with a landing in between. Part I consists of two beats round a straight line course, with points given for unassisted take-off, correct turns, and a spot landing. A *five-minute* period is then allowed during which refuelling, alteration to trim, etc., is carried out, then the model commences Part II, which again comprises take-off, turns, figures of eight, spins, loops and a final spot landing.

The full flight pattern (including the five-minute " break ") must be completed in the space of 15 minutes, so that with the five-minute limit between being called upon to make his flight and the model being airborne for the first time, a competitor has 20 minutes in which to do his stuff. Here is where competent team-work will count, for much will depend on the efficient use of the half-way break.

## State v. Penge

Penge Urban District Council *decided to ban* the flying of power-driven model aircraft on their local playing fields, contending that the amount of space available was far too limited. They communicated with the Home Office on the subject and have received a reply containing the following :—

> " The Council will appreciate that the purpose of by-laws regulating the flying of model aircraft is *not* to restrict flying, but to make it possible to permit flying in areas where permission for this pastime would otherwise have to be withheld. It appears to the Secretary of State that there may be space to permit the flying of control-line models in King George's Playing Field, Penge.
>
> If necessary, flying in this ground could be restricted by by-laws to a particular area of the ground and to specified days or hours. He would be glad if the Council would reconsider the matter on these lines."

The Penge Council is adhering to the prohibition, but has invited the Secretary of State to send an officer of the Home Office to inspect the playing fields in the belief that they will gain support for the ban.

And in nearby Croydon, the Croydon and District Model Aeronautical Club are still unsuccessful in their appeals to Croydon Council for permission to carry out model flying from any open space in the borough. The nearest ground available to them is Epsom Downs. There are more than 100 members in the Club, and fresh approaches are to be made.

## Seen in the contemporary press

**U.S.A.** . . . A unique variation for stunt control-line with ornithopter-like control on a flying wing, tips flap up and down in place of normal elevator, incidence change thus directs climb or dive . . . Big interest in ½A class has prompted a call for an International ½A event, our ·5 c.c. diesels should fare well if such an event came to be.

**Yugoslavia** . . . A report on the American Drone diesel rates that motor as ·28 b.h.p. at 7,500 r.p.m.

**Poland** . . . A description plus sketches of the return gear system for Wakefields. Shall we have a team from behind the curtain in '51 ?

## July's Big Event

We know of one rabid control-liner who has oft expressed his highest modelling ambition as an opportunity to fly on those super greens of the Empire Stadium, Wembley. He and thousands of others will have the chance to do just that on Saturday, July 21st, between 1 and 6 p.m. Thanks to the ardent efforts of the new S.M.A.E. Public Relations Officer Ken Brookes, Wembley, scene of the greatest sporting events held in the British Isles, has been obtained for the " Festival of Britain Model Flying Championships ".

Trophies have been generously promised by " The People " and will cover all seven classes of speed, open stunt, scale stunt, and the new and very popular two classes of team racing. Pre-entry is expected to close on July 1st. The public will be admitted to this vast Stadium at the rates of 2/6 adults, 1/6 juniors, and a good proportion of the proceeds will be allocated to the S.M.A.E. . . . All we need now is some hot stuff organisation and top notch fliers to put up the biggest show of control line ever staged. Go to it fellows !

## Wakefield whisperings

Rule changes for 1951 Wakefield Contests were expected to bring about changes in design from the rubber fraternity. Already we have noticed that the feathering airscrew introduced by Northampton's Ted Evans and described in detail in the AEROMODELLER of September, 1950, has been accepted as one of the finer points of design by many another Wakefield expert. Kentish Nomads, the Knights, were recently spotted discussing the feathering prop. with J. A. Gorham, 1950 Champion. Watchmaker Gorham has not only used Ted Evan's feathering prop. but also incorporates a lightweight set of brass return gears in the rear end of his Wakefield fuselage. The Knights have installed duralumin gears, and are currently developing their featherer. Eric Smith has a development of this prop. which will collapse on contact with any obstructive item and thus preserve its ½-oz. form for ever—he hopes ! Eric uses a paxolin tube for the prop. hub, whilst others are using aluminium. Needless to say maestro Ted Evans is one jump ahead of the pack and has already produced a featherer without rubber band blade tensioning and which has its works enclosed in a streamlined spinner, with only two positions for the blades, i.e., working pitch and fully feathered. (Other featherers go into " fully course " rather slowly—and can jam in the half cocked position.)

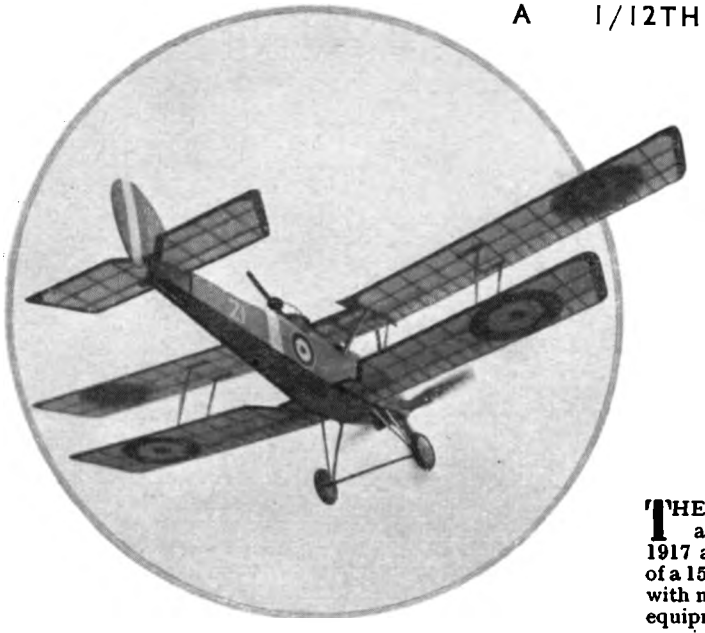
From Ron Warring we gather that his Zombie is now completely re-designed and the airframe weight is only 3½ ozs. His new prop. is a 20 in. free wheeler with 15° sweep back on the blades. The fuselage is only ⅛ in. longer than the original Zombie, so Ron is not taking advantage of the opportunity to lengthen the body as friend Jim Tangney (the Chicagoan) has —the latter's new fuselage measures 44 ins. !

*"Better late than never." Frank Hawkins, centre, receives the 1950 Junior Championship Certificate from "Rusty" at the Birmingham M.A.C. dinner. Reasons for this somewhat belated presentation were given in last month's "Hangar Door."*

A 1/12TH SCALE POWER MODEL

# R.E.8.

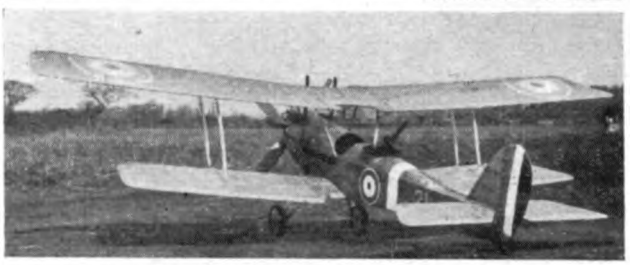
DESIGNED BY D. R. HUGHES

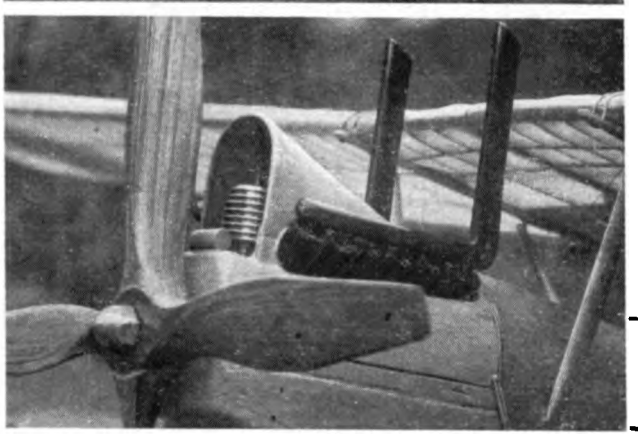


**Five years Press secretary, now Hon. Sec. Merseyside M.A.S. ..... Winner Lady Shelley Cup, 1949 ..... Age 23 ..... Main interests are Scale and Tailless ..... Also keen on Photography and Astronautics (member B.I.S.) ..... An Advertising Layout man ..... single, but very much attached.**

THE R.E.8 was a very well-known two-seater observation aircraft used extensively by the Royal Flying Corps in 1917 and 1918. With comparatively low power in the form of a 150 h.p. air-cooled RAF 4A, vee-twelve, it was—in common with many other aircraft of its day—often heavily loaded with equipment. In addition to crew and armament, its duties required that it carry wireless, camera and bombs.

The " Harry Tate " (which was the sobriquet designated it in those days) was noted for its inherent stability, machines of this type having been known to fly for hours and land safely after their crews had been killed in action. Thus—apart from its natural attraction for the modeller which arises from its striking appearance—this machine is undoubtedly an ideal subject for flying scale. Any shortcomings of the prototype (such as parting with its wings if put into a steep dive !) have not emerged in the model, which is quite stable under power and possesses a good glide, being quite lightly loaded.



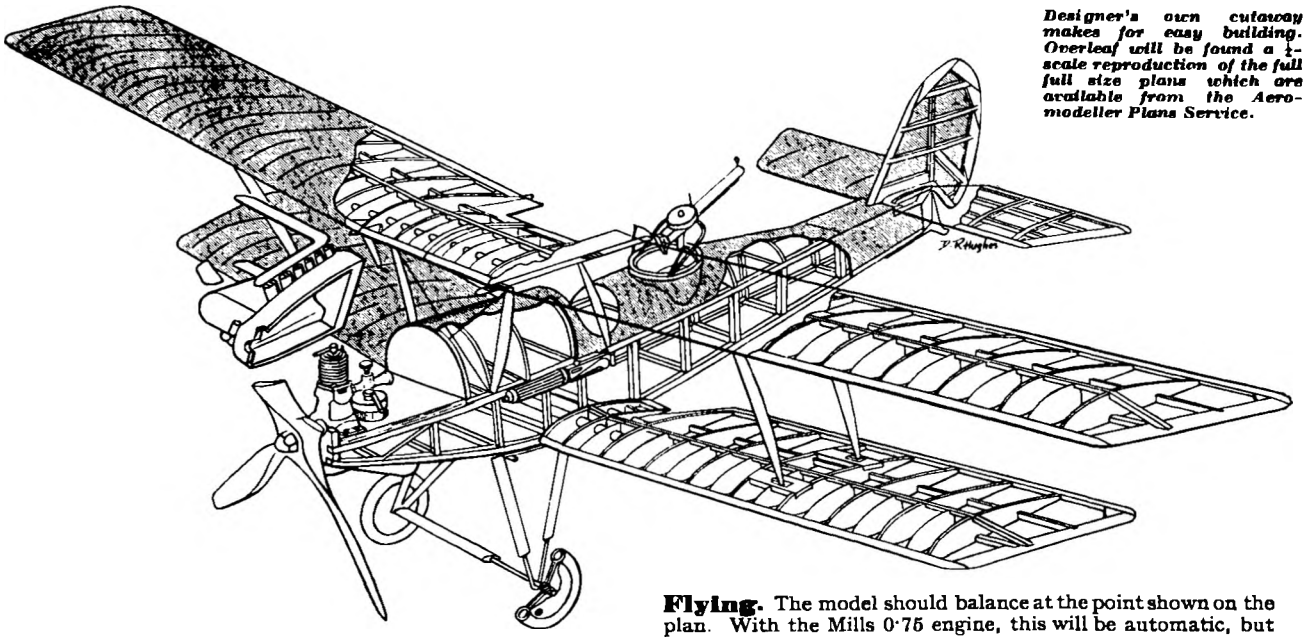


## CONSTRUCTION

**Fuselage.** The basic framework is built up from 3/16 in. square balsa, with joints in the places indicated on plan. The nose portion is steamed to the required curve (plan view) prior to assembly of the fuselage sides. The formers are next added to the top of this box structure, the wire centre-struts being bound and cemented to the longerons, and the brass tube for the U/C bound and cemented to the spacer indicated. The whole fuselage is now covered with 1/32 in. sheet balsa, except for the top decking forward of former 2, where the engine and removable cowling will be fitted. This can be clearly seen from the illustrations. The remaining details (guns, skid, etc.) are now made and fitted. The ply engine mount is fitted temporarily whilst building up the cowl and dummy engine. Before cementing permanently in place, this plywood mounting is given several coats of banana oil and fuel-proofer, as is the interior of the fuselage directly underneath it. Note the sloping bulkhead (¼ in. sheet, shown dotted on plan), and small door for fitting and removing engine bolts. This door also enables excess fuel to be drained off after flying.

**Undercarriage.** This is formed from 18g. wire, as shewn in the sketch on plan—first being threaded through the brass tube on fuselage. The 16g. axle is soldered inside the " vees " and the 18g. spreader-bar soldered across the " knees " of the U/C at the front, as shewn.

*Close-up left, and general views above, leave no doubt as to the true scale appearance of this splendid model. Those of our readers who have not spun a four-blader before had better watch out for their fingers.*



*Designer's own cutaway makes for easy building. Overleaf will be found a ½-scale reproduction of the full full size plans which are available from the Aeromodeller Plans Service.*

**Wings.** The wings are very straightforward, the only points to note being the strut attachments. These require the metal parts to be soldered up and assembled to the wood before glueing in position. Make sure that the dihedral is correct before fitting the 1/16 in. sheet webbing across the spars.

**Tailplane and Fin.** The outlines are built in the normal way, from ⅛ in. sheet, etc. The tailplane "ribs" are 1/32 in. × ⅛ in. laid flat across the L.E., spars and T.E., when it will automatically take the desired curve. When set, remove the tailplane from plan and insert the strips of 1/32 in. × ⅛ in. *upright*, from underneath. The fin is quite orthodox, being ⅛ in. sheet outline with strips of 1/32 in. × ⅛ in. each side of the spar, or rudder post.

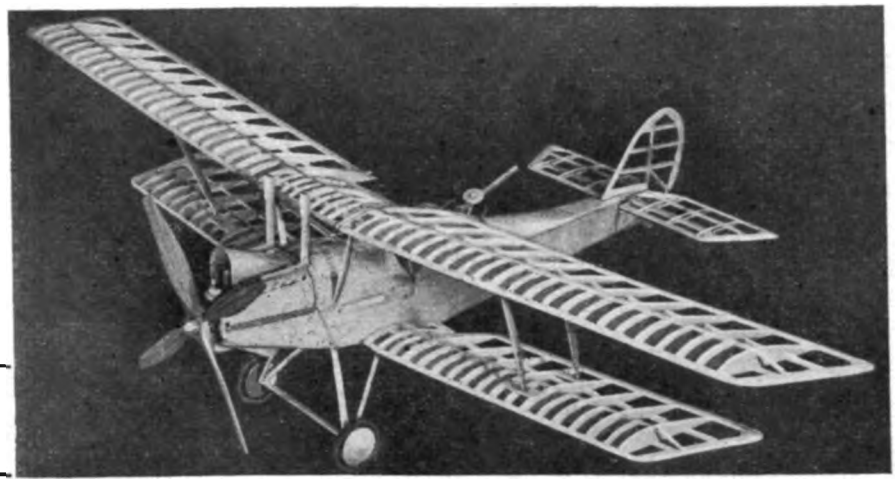
**Covering.** The whole model, including the fuselage, is covered with jap tissue or similar, and given two coats of clear dope. If desired, the upper surfaces may be colour-doped but this is somewhat tricky if a spray is not available. Brushmarks are unsightly when the model is viewed against the light, and so it may be preferred to use green tissue. The undersurfaces, in any case, are left clear-doped.

**Rigging.** The wings are sufficiently strong not to rely upon bracing, and so for flying purposes this has been kept to a minimum. Even if fully rigged (and the R.E.8 had a lot of wires !) it is doubtful if this would be seen in flight. The "wires" indicated on the plan are of 1/32 in. diameter grey rubber, and fix around the interplane struts, helping to keep them securely in position. Golf ball rubber or Dunlop indoor strip will do.

**Flying.** The model should balance at the point shown on the plan. With the Mills 0·75 engine, this will be automatic, but ballast at nose or tail may be needed for other motors. A calm day should be chosen for test glides. These should be made over long grass. The model is rather sensitive to rudder movement, and so all the adjustment for directional trim can be made by packing (not more than 1/32 in.) at either side of the tailplane leading edge, thus slewing the whole empannage round slightly.

To commence flying, get the engine running evenly—having removed the cowling for making adjustments, fuelling and so on. Now stop the engine, choke, replace the cowling and re-start. With the four-bladed airscrew, the Mills ·75 "ticks over" at a speed which is ideal both for test flying and for realistic scale flight. If, however, it is desired to fit a two-bladed one, an 8 in. × 5 in., or 9 in. × 5 in. is recommended. Increased sidethrust will be required and it is advisable to fly with the engine well throttled-down at **first.** The glide is a little better with the two-blader.

With a little practice, and if there is a smooth surface handy, one can achieve that ambition and rich reward of the painstaking scale modeller—seeing this grand "old stager" gliding down to a beautifully gentle "deadstick" landing.



*View prior to covering shows simple construction. Engine used on prototype was a Mills ·75, other suitable motors are the Allbon Dart, E.P.C. Moth, Amco ·87 and the E.D. Bee.*

A 43" WINGSPAN FLYING SCALE POWER MODEL

# R.E.8.

SCALE ½ FULL SIZE

BY

D. R. HUGHES



4/6

THE AERODROME, STANBRIDGE, NR LEIGHTON BUZZARD. BEDS.

THE AEROMODELLER PLANS SERVICE

ALL WOODS ARE BALSA UNLESS OTHERWISE STATED.

SPECIAL NOTE THE FIRST CYLINDER ON EACH SIDE OF THE COWLING COINCIDES WITH THE EXHAUST PORTS OF THE ACTUAL POWER UNIT (SEE C.5) THE TOP OF THIS (C.5) IS THEREFORE SPLIT THUS TO ALLOW EXHAUST TO ESCAPE

COWLING DETAILS

AIR SCOOP. 1 OFF. 1/32 SHEET.

ALL INTERIOR EDGES ROUNDED OFF & THE WHOLE WELL FUEL-PROOFED.

EXHAUST PORT.

BUILD UP WHILST IN POSITION ON MODEL.

WIRE FORMER FOR COWLING SCOOP. 18 G

18 SWG SPREADER BARS. FRONT & REAR SOLDER

BRACING FROM 1/32 DIA GREY RUBBER

FINE STEEL WIRE ¾" L TYPE SOLDERED TO TOPS & BOTTOMS OF FRONT STRUTS AFTER FUSELAGE IS SHEETED (IS THREADED THROUGH)

MACHINE GUN

PROJECTION FOR BAND

⅛ SHEET EACH SIDE

AIRSCREW

USE 2 - 10" x 6" PROPS CROSS HALVED TOGETHER AT BOSS

STIFF PAPER CONE

SOLDER

SOLDER

WHEELS. REMOVE THE HUBS FROM PAIR OF 2" DIA AIRWHEELS & REPLACE WITH 2 DISCS OF ⅛" PLY. THIS FLATTENS & BRINGS DIAM UP TO THE REQUIRED 2¼"

BUSH 16 G

NUT

FRONT CENTRE SECTION STRUTS 18 SWG

⅛" SHEET EACH SIDE

STREAMLINE SECTION

FRONT VIEW

REAR CENTRE SECTION STRUTS 18 SWG.

1 OFF RIGHT 1 OFF LEFT

SIDE

FRONT

MAKE 1 OFF RIGHT. 1 OFF LEFT. SEE SPECIAL NOTE (BELOW)

PAPER TUBE

EXHAUST PIPES 2 OFF 3/16 SHEET

AIR SCOOP C.7

NOTE THIS VIEW DOES NOT SHOW TRUE LENGTH OF STRUTS. SEE SEPARATE DETAIL

SERVICING DOOR CUT THIS AFTER SHEETING WITH 1/32 & ADD ⅛" SHEET THUS

⅛ DIA BAMBOO PEG

USE THESE AS HANDLE

TO BE SNAP FIT INTO FUSELAGE

SAND TO DOTTED LINES AT FRONT

3 LAMINATIONS 1/16" SHEET

⅛" SHEET BACKED WITH 1 MM PLY.

2¼ DIA WHEELS (SEE FRONT VIEW)

BRASS TUBE 18 G 1/0 BOUND TO ⅛" SHEET CROSSPIECE

⅛" SHEET EACH SIDE

2 PINS FOR U/C BANDS

BIND STRUTS TO UPRIGHT ETC.

⅛" SHEET

LONGERONS & SPACERS ALL 1/16 SQ

⅛" SHEET

⅛ x ⅛" BAMBOO WING RUNNERS

⅛" SHEET

PIN

RINGSIGHT

5/16 DOWEL

⅛ x ⅛

MOUNTING FOR LEWIS GUN 16 SWG.

18 SWG

16 SWG DOUBLE.

PLASTIC PIPING SPLIT OPEN

CARD TUBE

WHOLE FUSELAGE IS COVERED WITH 1/32 SHEET. GRAINING IS OMITTED IN OTHER AREAS FOR CLARITY

FIN OUTLINE FROM ⅛" SHEET

⅛ x ¼ TAPER AT ENDS

⅛ x 1/32 EACH SIDE

⅛ DIA BAMBOO PEG

1/32 SHEET

⅛" SHEET

¼" SHEET

SECTION

PIN OR JOG WIRE BOTTOM OF SI... TO SAVE WEAR

F1 F2 F3 F4 F5 F6 F7 F8

1 OFF ⅛" SHEET.

1 OFF ⅛" SHEET. FACED WITH 1 MM PLY.

BUILD UP THE GUIRING FROM ⅛ x 1/32 LAMINATIONS

1 OFF ⅛" SHEET

1 OFF ⅛" SHEET

1 OFF. ⅛" SHEET

1 OFF. ⅛" SHEET

BRASS TUBE

PAPER TUBES

STEP

HOLE FOR RUDDER PEG

(NO DOWNTHRUST)

UP TO 4° SIDE THRUST.

½ PLY ENGINE MOUNT SHAPE SHOWN IS FOR MILLS .75"

FOR 6 B.A. BOLTS

THREAD ONTO BRASS TUBE BOUND TO FUSELAGE BEFORE SHAPING.

PAPER TUBE WITH STRIPS OF 1/32 SQ.

SOLDER & BIND ENDS

DETAILS FROM 1/32 SHEET ETC

BLOCK

VICKERS M.G. SIDE & TOP VIEWS

BRASS TUBE

TIN

BEND AS SHOWN

STRUT FRINGS

CEMENT & PUSH THRO'

SOLDER TUBE TO THE TIN & PUSH TIN THRO' BALSA THEN BEND ENDS OF TIN OVER EACH OTHER UNDERNEATH & SOLDER TOGETHER

⅛ x ½

THIS SHOWS EXACT LENGTHS OF 1/16 COMPONENTS. NOT SHOWN ON SIDE VIEW

ANGLE 14 SWG REMAINDER 18 SWG.

INTERPLANE STRUTS 18 SWG. MAKE 2 RIGHT 2 LEFT (AS FRONT VIEW)

FRONT VIEW

⅛ SHEET

⅛ x ¼

1/32 SHEET CAPPING.

¼ SQ.

⅛ x 1/32 UPRIGHT.

⅛ x 1/32 TOP ONLY

⅛ SHEET

⅛ SHEET

⅛ x 1/32

SECTION

⅛ x ⅛

T.E. ⅛ x ⅜

34 OFF 1/32 SHEET R

2 OFF 1/32 SHEET RA

2 OFF 1/32 SHEET RB

RC 4 OFF 1/16 SHEET

2 OFF 1/32 SHEET RD

2 OFF ⅛" SHEET R1

4 OFF 1/16 SHEET R2B

L.E. 3/16 SQ.

T.E. ⅛ x ½

DIHEDRAL FROM HERE 1" AT

SPARS ⅛ SQ TOP & BOTTOM R2

¼ SHEET WEBS R2

⅛" SHEET

⅛" SHEET

UPPER WING

R R2 R2A R2B R3 R4 RA RB RC

PAPER TUBES

¼" SHEET

L.E. 16 SQ.

(⅞" AT TIPS)

DIHEDRAL FROM HERE

SPARS ⅛ SQ TOP & BOTTOM R2

1/16 SHEET WEBBING

PAPER TUBES 3/16 I.D.

⅛" SHEET

LOWER WING

⅛" SHEET FLUSH WITH BOTTOM OF RIB

T.E. ⅛ x ½

4 OFF ⅛" SHEET R1

2 OFF 1/16 SHEET R2

R1 R2

# S.M.A.E. Contest Programme 1951

| | | | |
|---|---|---|---|
| 25th March | GAMAGE CUP<br>PILCHER CUP | U/R RUBBER<br>U/R GLIDER | D/C |
| 15th April (P) | ASTRAL TROPHY<br>RIPMAX TROPHY<br>S.M.A.E. CUP | F.A.I. POWER/DURATION<br>R/C<br>A/2 ELIMINATOR | AREA |
| 6th May (P) | WESTON CUP<br>HALFAX TROPHY | WAKEFIELD ELIMINATOR<br>U/R POWER/RATIO | AREA |
| 13th & 14th May | BOWDEN TROPHY<br>POWER<br>"AEROMODELLER" RADIO-CONTROL TROPHY | P.A.A. LOAD<br>POWER/DURATION<br>R/C | INTERNATIONAL CENTRALISED |
| 27th May (P) | K. & M.A.A.<br>GUTTERIDGE | A/2 ELIMINATOR<br>WAKEFIELD ELIMINATOR | AREA |
| 10th June | PREMIER SHIELD<br>A/2 TROPHY | WAKEFIELD TRIALS<br>A/2 TRIALS | CENTRALISED (Cranwell) |
| 1st July (P) | M.E. CUP<br>WOMEN'S CUP<br>1·5 c.c. POWER | U/R TEAM GLIDER<br>U/R RUBBER/GLIDER<br>U/R POWER/DURATION | AREA |
| 15th July | KEIL TROPHY<br>LADY SHELLEY | U/R POWER/RATIO<br>TAILLESS | D/C |
| 21st July | C/L SPEED<br>C/L STUNT<br>TEAM RACE | C/L CHAMPIONSHIPS<br>U/R AND SCALE<br>"PEOPLE" PRIZES | CENTRALISED (Wembley) |
| 5th Aug.<br>5th & 6th Aug.<br>5th Aug.<br>5th Aug.<br>5th & 6th Aug.<br>6th Aug. | GOLD TROPHY<br>C/L SPEED<br>THURSTON CUP<br>M.A. TROPHY<br>S.M.A.E. TROPHY<br>SIR JOHN SHELLEY | C/L STUNT<br>SPEED<br>F.A.I. GLIDER<br>F.A.I. RUBBER<br>R/C<br>F.A.I. POWER/DURATION | (Fairwood Common, Swansea)<br>NATIONALS<br>CENTRALISED |
| About 19th Aug. | FREE FLIGHT<br>FREE FLIGHT<br>FREE FLIGHT<br>R.T.P. | STICK H/L<br>FUSELAGE H/L<br>UNORTHODOX<br>CLASS A & B & SPEED | INDOOR NATIONALS<br>CENTRALISED (Manchester, Corn Exchange) |
| 2nd Sept. (P) | FARROW SHIELD<br>JETEX<br>SCALE POWER | U/R TEAM RUBBER<br>RATIO<br>POWER/DURATION | AREA |
| 16th Sept. | BRITISH CHAMPIONSHIPS<br>TAPLIN TROPHY | RUBBER GLIDER POWER<br>Teams of 6<br>R/C | CENTRALISED (Cranwell) |
| 30th Sept. | DAVIES TROPHY | TEAM LEAGUE FINALS | CENTRALISED (Fairlop) |
| 7th Oct. | U.K. CHALLENGE MATCH | ENGLAND, WALES, SCOTLAND & N. IRELAND | CENTRALISED (Heathfield, Nr. Prestwick, Scotland) |
| 14th Oct. | FLIGHT CUP<br>FROG JUNIOR | U/R RUBBER<br>U/R RUBBER/GLIDER | D/C |
| 28th Oct. | HAMLEY TROPHY | U/R POWER/DURATION | D/C |

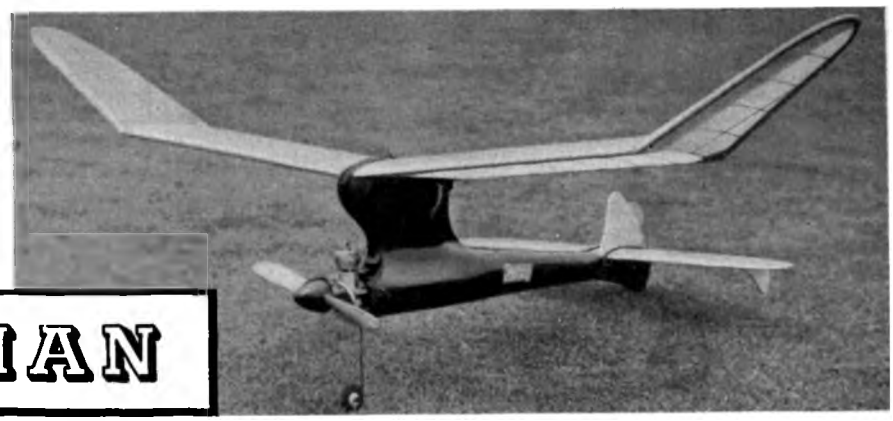
(P) Indicates PLUGGE CUP events. The RIPMAX may be used as a qualifier for the INTERNATIONAL R/C Contest.

The ASTRAL TROPHY may be the eliminator for the International Power event 13th and 14th May. Radio events over 2 days at Whitsun and August.

50" SPAN CONTEST POWER DURATION MODEL FOR 3·5 c.c. MOTORS BY

## GUSSIE GUNTER

**Well-known Bushey Park power modeller .... Aged 31 .... occupation, B.O.A.C. Aero Engine Fitter .... ardent motor cyclist .... has lost more motors than he cares to remember!**



# CLUBMAN

MANY readers will remember Gussie and his wife Pam in that heyday of theirs, when their drab yellow Ohlsson or Bantam powered Banshees gave an exhibition of fast-rate spiral climb few could equal, and none surpass. Between them, the Gunters managed to collect most of the worthwhile first places of '47 and were always in the first six at the '48 power duration comps. Gus continued through the '49 season with Zoomers—developments of the Banshee he established in this country; but though always the keenest of competitors, never managed to regain his old top of the ladder position. Not that the old master was losing that magic trimming touch, for the screaming climb remained a Gunter trademark at every event; but it just happened that at each major contest, something just had to put gremlins on the job.

Soon after the introduction of the Amco 3·5 diesel, we heard that Gus had invested in that British product, and made an all-British design to suit. Furthermore, we heard that Hounslow Heath was fairly quaking at the even faster rate of climb of this latest from the stable.

That model became the CLUBMAN, one of the cleanest pylon designs yet seen, and one of the most outstanding performers of 1950. A 42 in. version scaled down to suit Alan Allbon's self-made Javelin 1·49 c.c. diesel, collected a well deserved top place at the '50 West Essex Gala, with the flight/power-run ratio of 43·7 : 1 over two flights, and went on to win the Sevenoaks Gala a week later. Gussie's own CLUBMAN was not so very far behind in both events.

## CONSTRUCTION

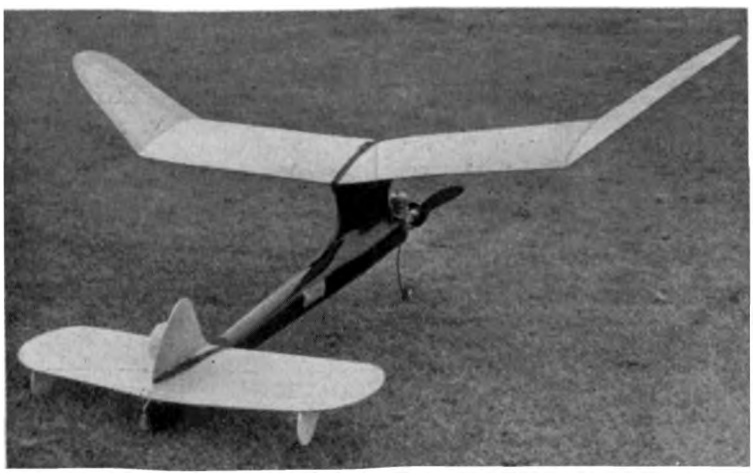
**Fuselage:** Cut the horizontal and upper and lower vertical crutches from ¼ in. sheet. Firmly cement the ¼ × ¼ in. hardwood motor bearers in position, assemble the crutches and under-fin. Add all formers and the front blocks, noting that a detachable undercarriage box may be fitted behind the main front bulkhead. Position wing and tail platforms, add dowels and tail retaining hooks, then plank with 1/16 × ¼ in. strips. Cover with lightweight Modelspan and fill with Sanding Sealer before colouring to suit.

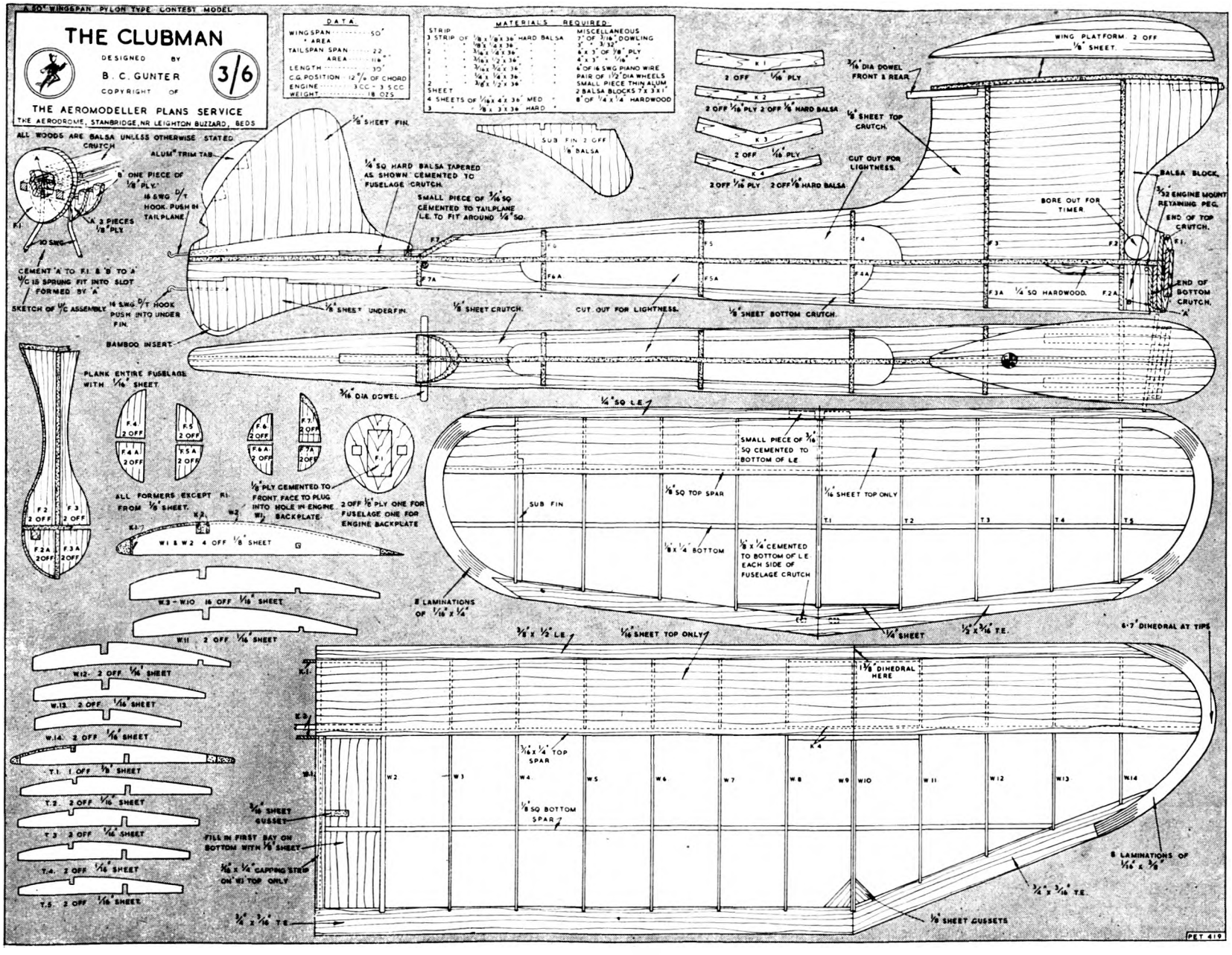
**Wing:** The wing is of conventional structure and needs no explanation. Add the ¼ × ¼ in. spar on the undersurface after lifting off the building board, and fit the leading edge sheet covering after the wing is assembled in one piece with the dihedral joints set dry. Cover with Modelspan.

**Tail and Fin:** These are especially simple and robust in structure. Add the sub fins after covering tail with Modelspan, and make sure that the tailplane leading edge is keyed to the fuselage so that it cannot shift when the tail assumes a negative angle during d/t action.

**Motor Mount:** Radially mounted motors can be screwed to a detachable bulkhead and this keyed to the fuselage. Elastic bands around the dowels will give a knock-off mount and at the same time allow packing between the bulkheads to be used for motor trimming. Beam mounted motors can be fixed on extended bearers in the usual manner.

*Photos top and bottom left illustrate sleek lines of this contest winner which in this instance is fitted with a monowheel undercarriage. Below right, is a scene from the 1950 Nationals showing wife Pam and clubmates assisting Gus at the take-off area.*






THIS IS A ¼ SCALE REPRODUCTION OF THE FULL SIZE PLANS WHICH ARE AVAILABLE PRICE 3/6 POST FREE, FROM THE AEROMODELLER PLANS SERVICE.

# TOPSY

A NEW-RULER WAKEFIELD FROM NORTHERN IRELAND

BY

**NORMAN OSBOURN**

THE DESIGNER. Age 27 . . . . Metal Turner . . . . In Irish Wakefield team 1949 . . . . Main interests are Wakefield and Power Duration . . . . Also keen on Photography.

TOPSY is the sixth of a series, the original was designed in 1947 with the intention of flying it in the Irish Nationals of that year. However, the prototype was lost 13 mins. 13 secs. o.o.s. on a test flight two weeks before the event, and the second version was hastily built in the odd fourteen days. Flown without previous tests, the Mk. II finished eleventh and two other similar designs placed in the first twelve. Mk. II was afterwards lost on a 14 mins. 4 secs. o.o.s.

Incorporating slight mods. for 1948, Mk. III also disappeared after 10 mins. 26 secs. and Mk. IV placed first in the Belfast open rubber event of '48. The 1949/50 version was slightly cleaned up for the Irish Wakefield eliminator, in which it was successful enough to gain a team place. In the Cranfield Wakefield event of 1949, Topsy placed 18th and afterwards collected sixth position in the 1949 Irish Nationals.

Simple in its construction, yet incorporating features akin to the most efficient of Wakefields, Topsy should appeal to many beginners in the classic event of model flying. It completely conforms to the 1951 Wakefield rulings, and thanks to the tip-up tail dethermaliser now incorporated, promises a first-class competition performance for 1951.

## CONSTRUCTION

**Fuselage:** Apart from the Warren girder structure, the fuselage is built in the conventional manner. Cover the third bay from the nose with Modelspan before adding the stringers, to prevent the ends from damage through handling. Undercarriage tubes made from discarded Jetex wick containers which have been flattened, are firmly bound to the fuselage upright.

**Wings:** Begin by cutting 38 main ribs and two tip ribs to the N.A.C.A. 6412 section from soft 1/16 in. sheet balsa. A slight step will have to be cut in four of these to allow for the sheeting at the root. Root ribs are cut from $\frac{1}{8}$ in. medium sheet, and with No. 2 ribs are slotted for the wing tongues. Fix the dihedral by cutting the wing box through the centre and bevelling the edges so that when they are threaded on the finished wing tongues, the two faces meet neatly with the tip of each wing panel raised $4\frac{1}{8}$ in. above the root level.

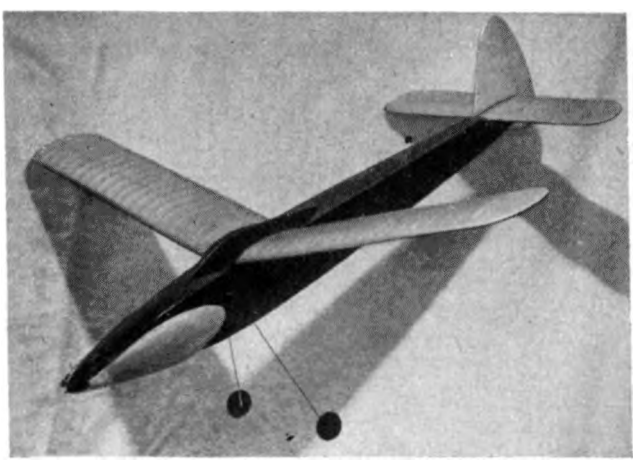
**Propeller:** The propeller calls for considerable care in its construction. Particular attention should be paid to the drilling of the holes for the hinge, a double angle of 16° will ensure the blade folding flat on the fuselage. Make sure that the soldered junctions of the wire hinges are well made and there is no possible danger of the joint breaking during flight.

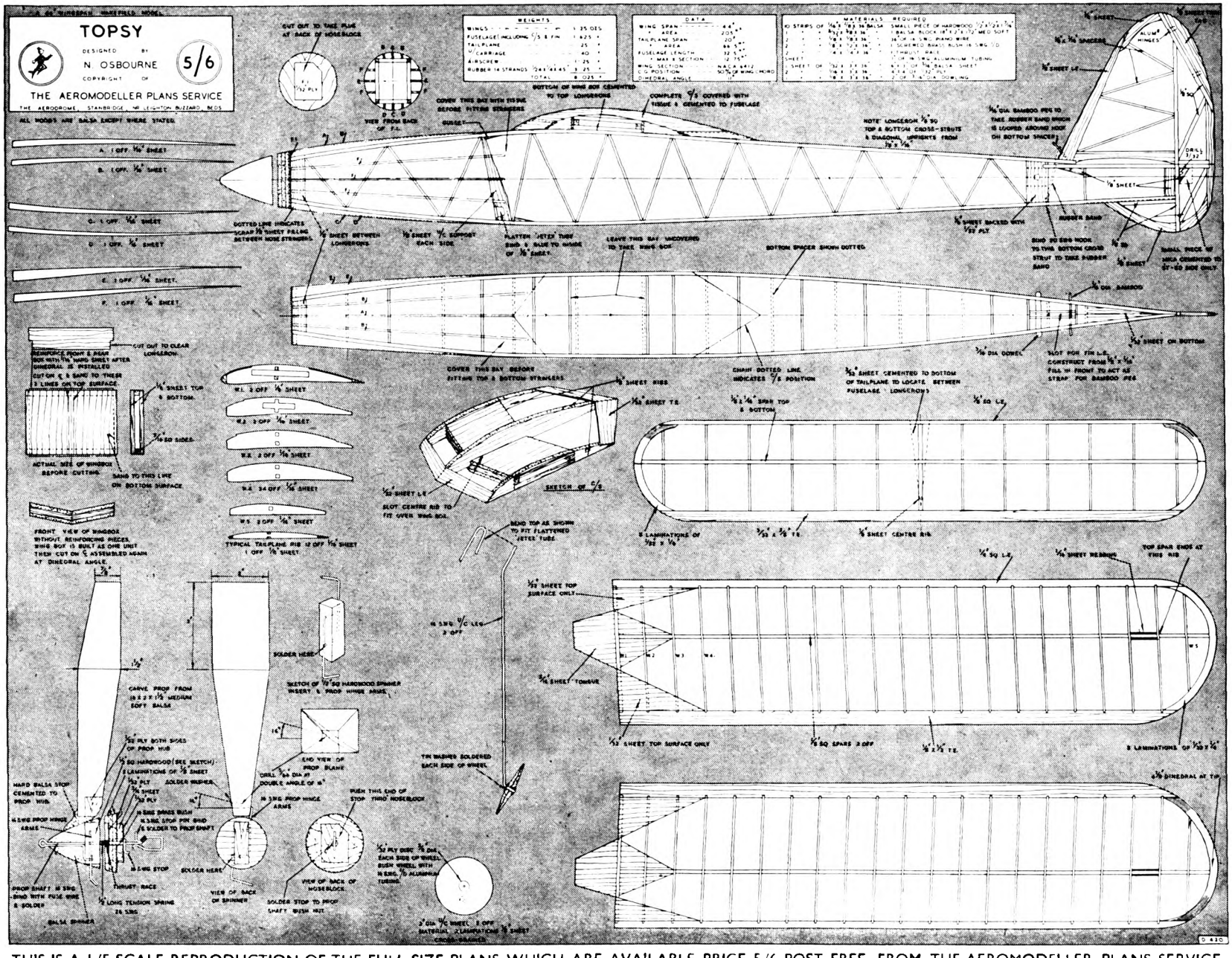
**Tailplane and Fin:** Construction of the tail and fin is quite conventional. On the original models the fin was built integral with the fuselage. However, if the builder desires to fit a pop-up tail dethermaliser, it will be necessary to modify the construction to suit his needs. The plan displays the tip-up tail used on the 1950/51 Topsy.

**Covering:** The whole Topsy series have been covered with jap tissue flying surfaces and rag or Modelspan on the fuselage. To protect the rubber from exposure to strong sunlight and to aid visibility, white fuselage covering may be dyed black with black "leather" dye which is obtainable from most boot repair shops.

**Flying:** After the usual preliminary hand-launch glide tests, the model should be adjusted to climb in medium-size right-hand circles under power and glide in tight right-hand circles. No downthrust has been found necessary on the prototypes, although it might be considered preferable to the use of excessive side thrust for curing power stalls.

Simple enough? Then why not get out the building board and razor blade, pins, strip and sheet, and build yourself a guaranteed performer with a long and first-class pedigree?




TOPSY
DESIGNED BY
N. OSBOURNE
5/6
COPYRIGHT OF
THE AEROMODELLER PLANS SERVICE
THE AERODROME, STANBRIDGE, NR LEIGHTON BUZZARD, BEDS
WEIGHTS
DATA
MATERIALS REQUIRED
ALL WOODS ARE BALSA EXCEPT WHERE STATED
SKETCH OF C/S
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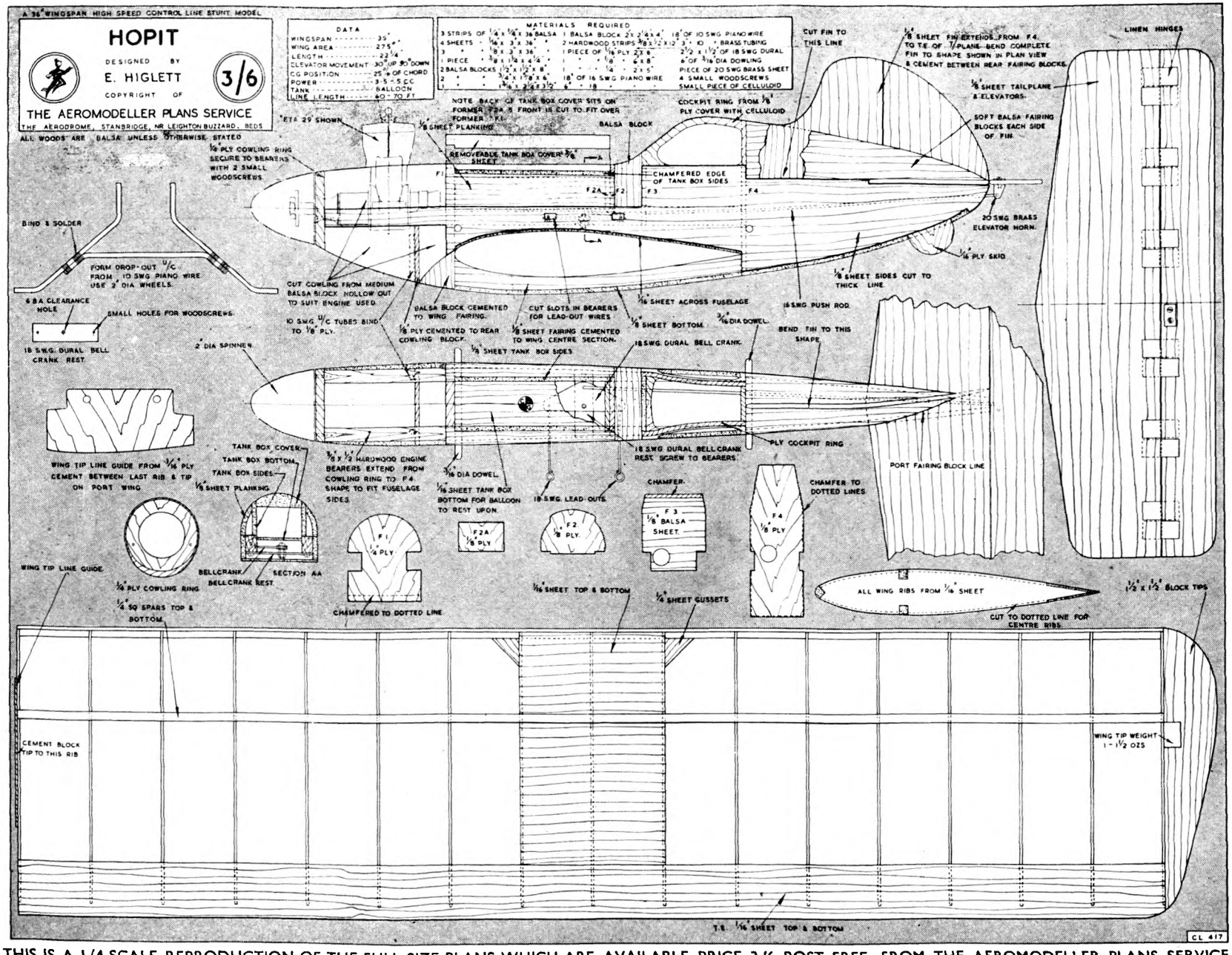
THIS IS A 1/5 SCALE REPRODUCTION OF THE FULL SIZE PLANS WHICH ARE AVAILABLE PRICE 5/6 POST FREE, FROM THE AEROMODELLER PLANS SERVICE.

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# HOPIT

## A 35 INCH SPAN SHORT COUPLED STUNT MODEL FOR MOTORS FROM 3·5 TO 5 c.c's.

BY
ERIC HIGLETT

Aged 17 years . . . member of Eastleigh and District Model Club . . . at present an Apprentice Aeronautical Engineer . . . other interest beside stunt work is Radio Control.

*Left, the designer displays a profile view of the model, the picture below amply demonstrates how short is the moment arm.*

FEW British modellers would deny that the feverish enthusiasm for stunt control line which was so evident over 1949/50, is now on the wane, and settled to the band of more discriminating stunt men who prefer to operate machines with a difference and quality of performance.

This stage in model development appears to have arisen throughout the model clubs of the Empire, and has produced many a good looking stunt design from the remaining pure-stunt enthusiasts. Such a modeller is Eric Higlett of Eastleigh, for though we make no effort to claim his latest design, " Hopit ", as a good looker, we can present it as a new looker with plenty of zip in its 85 m.p.h. flight pattern.

The opalescent silvery blue prototype first caught our eye at the Southern Counties Rally, Thorney Island, last year. Its pert highly polished fuselage has a curvatious underside which one might well term " loop happy ", and the Eta 29 mounted up front, promises a highly potent performance.

Since that late season date, stunt events have taken a holiday from the Contest calendar, and " Hopit " has not yet had its chance to prove its Jack-rabbit manœuvres against the rest of the field. No doubt 1951 will see the remedy, for if any of the new high speed stunters have a winning chance at '51 events, " Hopit " will be high on the list among them.

### Construction

**Fuselage, Tail & Fin:** Cut bearers to shape and side panels from ⅛-in. sheet, not forgetting to cut two squares in the bearers and side panels to clear lead-out wires, now cut all formers and join F.1 and F.4 to bearers. Cement side panels on either side and fit bellcrank, push-rod and lead-out wires.

The rest of the formers and the cockpit sides can now be fitted. Add block to former F.1 to take undercarriage tubes, which are bound to ⅛-in. ply former. Screw the front ring to the engine bearers and fit the block between this and the undercarriage tubes to streamline the nose. Cut out the tail assembly and fit hinges, then cement tailplane to the fuselage and attach the elevator horn to complete the control system.

The rudder and fairing block are next cut to shape, and fixed in place. The ⅛-in. sheet bottom of the rear fuselage completes that end of the body, whilst the fuselage in front cockpit is planked as far as the tank box cover The tank box lid is carved, and front upper cowling shaped to suit the motor installed. Now fill the bay between the tank box and the cockpit with block and plastic wood. Cover the cockpit frame with celluloid (a dummy pilot makes for good appearance), and fit the wing dowels.

Sandpaper the fuselage and tail assembly before covering with Modelspan which aids grain filling. After several coats of sanding sealer, rub down and apply colour dope to choice.

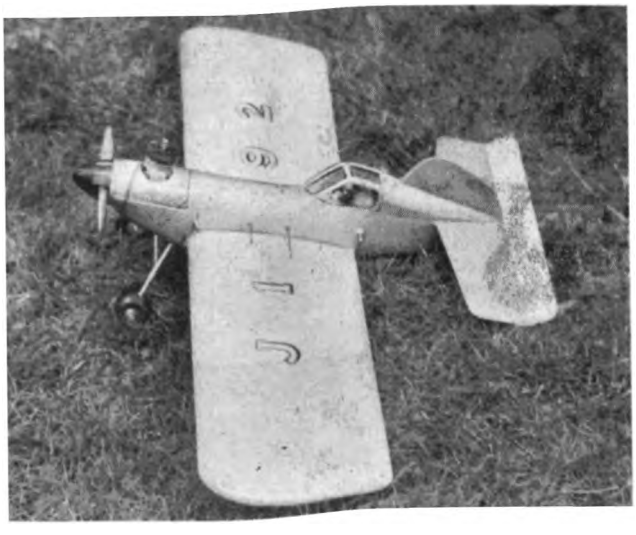
**Wing:** First cut out 17 ribs, making three of these 1/16 in undersize to allow for the centre section sheeting. Pick two hard ¼-in. spars and mark for the rib position. Then cement ribs to one of the spars, and attach the other spar once the ribs have been set true. Then fit the T.E. and finally attach the L.E. Sheet the centre section with 1/16-in. sheet and add the tip wire guide. Carve the wing tip blocks and cement in place. About 1-1½ ozs. of lead in the outer wing tip will give correct balance laterally to keep the lines tight throughout all manœuvres.

Cover the wing with Modelspan before final completion with the addition of the box on the centre section underside, which follows the fuselage contour.

The original engine used was an Eta 29 but any other 5 c.c. glow-plug engine may be used.

The tank was an ordinary " sausage " balloon which gave no trouble at all. Line length was 70 ft., under normal flying conditions with a 9×6 " Truflo " prop. Shorter lines could be used in extra windy conditions.

A designer's footnote on this design emphasises that the elevator range should definitely not exceed 30 degrees either up or down movement. Nor is it of any advantage to increase the elevator area—you will find " Hopit " quite fast and slick enough for any stunt, if you build it as presented here



# AERIALS


*This article on the theory of radiation and polarization of aerials comes from an expert on working models of full-size broadcasting aerials. It will be followed in a future issue, by a practical article on the Marconi Quarter-wave aerial as used for model aircraft control*

By F. C. JUDD

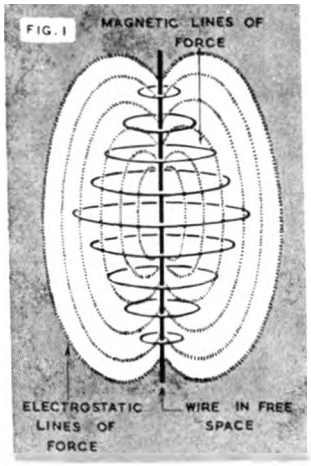
## Foreword

*The following article is based on a lecture given to The West Essex Aeromodellers Club when the application of Aerials to Radio-controlled Model Aircraft was discussed. The writer has endeavoured to put into simple language the theory of radiation, the polarization of radio waves and some notes on radiation patterns which it is hoped may prove of interest to readers and further the activity of Radio Control.*

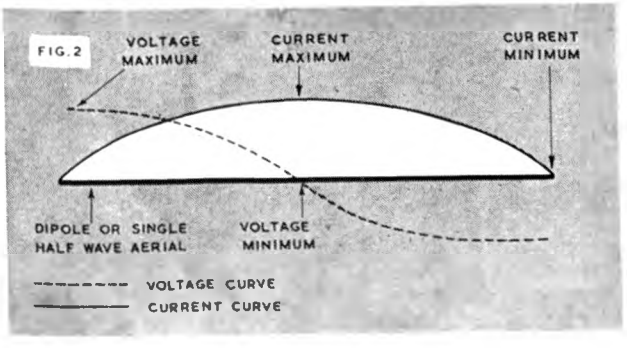
## Radiation

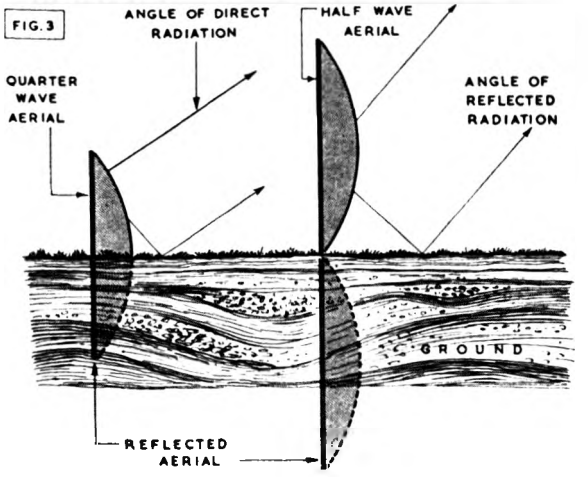
When a current flows along a straight conductor in free space, there is associated with it a *magnetic field*, whose lines of force travel in concentric circles, occupying the space in a co-axial cylinder of theoretically infinite diameter. At the same time there is an *electrostatic field* between the wire ends due to the potential difference between them ; at the centre this field is parallel to the wire and also extends outward to infinity. These lines of force are at right angles to the *magnetic field* as shown in *Fig.* 1.

If the current is alternating, both magnetic and electrostatic fields change in sympathy, the energy involved in creating the fields during the growth of current and voltage being returned to the wire as the fields die away on reversal. This is true, however, only for very low frequencies, for as the frequency is raised more and more of the energy fails to return to the wire, and is radiated into free space, hence at high or radio frequencies we can transmit energy from one point to another.



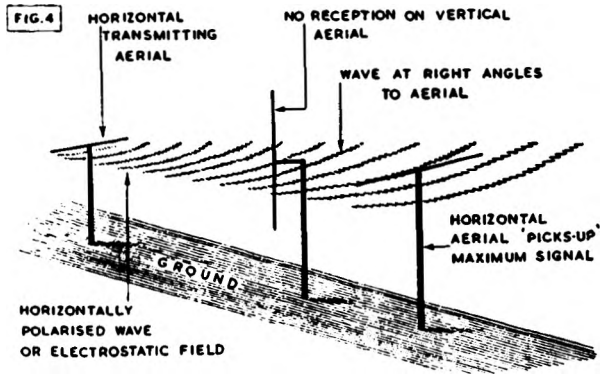

This loss of energy represents a load on the wire and can be regarded as a resistance, when referred to the wire, and is known as the radiation resistance. This must not be confused with the impedance of the wire, a measurement used in matching aerials to feeder lines, etc. The measure of its ability to produce a magnetic field is its inductance, and an electrostatic field its capacity. The square root of the ratio of these values gives the characteristic impedance of the wire. When the length of the wire is such that it is a half wavelength long electrically it resonates on its own as does a tuned circuit and is called a dipole.




The resonance of a half wave wire may be more easily visualised by supposing a small group of electrons dropped on to the end of the wire one per cycle at its natural frequency. This electron group has a negative potential. The moment they touch the wire the average potential of the wire will be lowered, the far end appearing positive to them ; thus a flow of electrons will immediately start towards that end, and this flow constitutes a current, having its maximum intensity at the centre, the instant the charges at each end reach equal values, *i.e.* at the instant the potential is the same all along the wire.

*Fig.* 2 illustrates the current and voltage distribution on a half wave aerial or dipole. As electrons pile up at the far end, as they must do, having nowhere else to go, they will repel oncoming electrons more and more strongly, the negative charge accumulating until the current is finally stopped. At this instant the energy of electrons is stored as a negative potential at the far end of the wire, *i.e.* the charges are now reversed and the cycle has passed through 180 degrees. The current surge will now begin again, and at 270 degrees will reach maximum as before but in the opposite direction. At 360 degrees the current will have stopped again, and conditions will be the same as at the start, except that some energy will be lost through radiation, and some through heat because the wire is not a perfect conductor. If the make-up charges are bigger than the losses, this standing wave or oscillation of current and voltage will increase until all the energy is used up. In general the object of the aerial designer is to produce standing waves of this nature on the radiating elements of the aerial, so that radiation takes place in a *known manner* and *where required*. A similar resonance may be obtained with a quarter-wavelength of wire if one




end is on a theoretically infinite conducting sheet (*e.g.* copper) placed perpendicular to the wire. The reflection from the sheet then produces an image of the quarter-wave wire, as, say, a pencil standing on a mirror appears to be carried on into the mirror, and the system resonates as freely as a half-wave wire, but with halved radiation resistance. *Fig.* 3 shows the effect, which holds good for all aerials, though the mirror action of the earth is dulled by its fairly high resistance a factor which will be dealt with later.

It will be seen in *Fig.* 3 now reflection from the earth takes place and the angle of reflection is determined by the height of the aerial above ground. As the height in increased the relative phase angle between the direct and reflected waves will vary, causing cancellation and addition in different directions. a fact which ultimately decides the shape of the vertical radiation pattern of the aerial.

## Polarization

No mention has yet been made of radiation from horizontal aerials, and generally the theory of radiation remains the same; except for one very important factor, namely "*polarization*". This refers to the plane of the electrostatic field with relation to the ground. Since with all aerials the electrostatic field is on the same plane as the wire, it is not difficult to decide the polarization of the radiation, *e.g. for a* vertical aerial the polarization is *vertical*, and for a horizontal aerial it is *horizontal*, which means that the receiving aerial must be on the same plane as the transmitting aerial in order that maximum signal voltage may be induced. At long ranges the polarization becomes changed and for medium frequencies the orientation of the aerial is not critical, but at short distances and for *high frequencies* the plane of the aerial becomes very important. Even at 27 Mc./s, the lower Radio Control frequency, the effect of polarization will be very marked and the possibility of no signal to a vertical receiving aerial from a horizontal transmitting aerial will result and of course, vice versa. At 465 Mc./s the effect is even more prominent. The writer has carried out numerous experiments on frequencies of 144, 200, 300 and 460 Mc./s in order to determine the effects of polarization and to plot the radiation patterns of aerials (*ref.* 1). Reference to the A.R.R.L. Radio Handbook or to the Admiralty Handbook, will provide more detailed information on the subject of polarization and aerials generally (*ref.* 2).

*Fig.* 4 shows the result with a vertical aerial in a horizontally polarized wave.

## Resumé

From the above it will be seen that:—

1. RADIATION IN THE VERTICAL PLANE VARIES IN INTENSITY WITH THE HEIGHT OF THE AERIAL ABOVE GROUND, A FACT WHICH APPLIES TO BOTH VERTICAL AND HORIZONTAL AERIALS.

2. RADIATION FROM VERTICAL AERIALS OCCURS ALL AROUND THE AERIAL WITH EQUAL AMPLITUDE OR INTENSITY IN THE HORIZONTAL PLANE. (See polar diagrams for vertical aerials.)

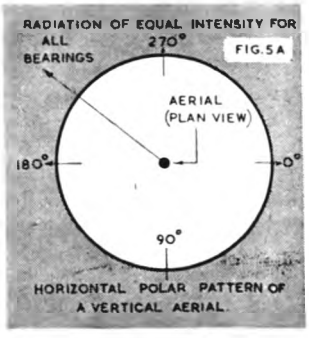
3. FOR MAXIMUM SIGNAL STRENGTH TO THE RECEIVER THE RECEIVING AERIAL MUST BE ON THE SAME PLANE AS THE TRANSMITTING AERIAL.

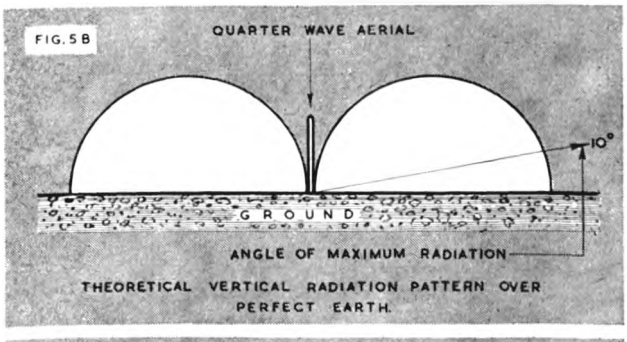
4. THE HIGHER THE FREQUENCY THE MORE IMPORTANT POLARIZATION BECOMES, PARTICULARLY AT SHORT RANGES.

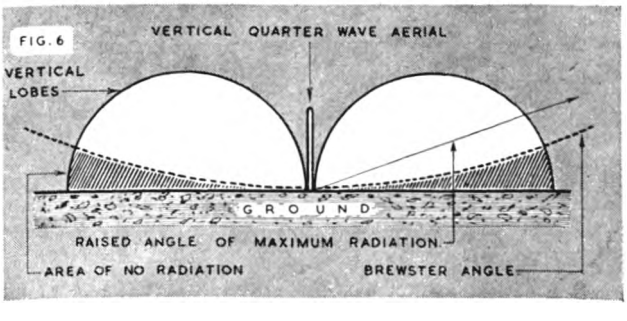
## Polar Patterns

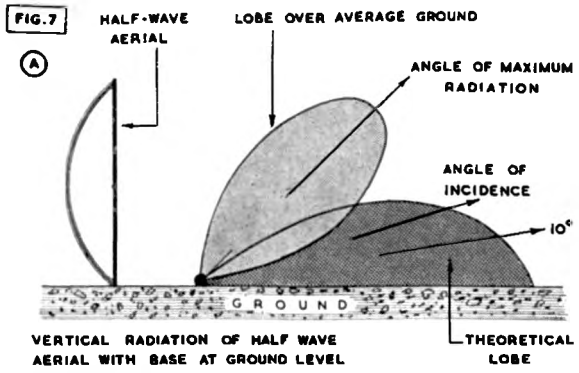
As already mentioned, radiation from any aerial system occurs in certain directions only, these being determined by the resonant length (in the case of horizontal polar patterns from horizontal aerials and vertical patterns from vertical aerials) and the height above ground (in the case of vertical patterns from both vertical and horizontal aerials). Let us take first the simple vertical quarter-wave aerial, its base at ground level. The theoretical horizontal pattern for any vertical aerial is as already mentioned all around the aerial, *e.g.* all azimuthal directions (*Fig.* 5*A*), and the theoretical vertical radiation pattern for the quarterwave is shown in *Fig.* 5*B*.

Over perfect earth the vertical pattern will hold good but for normal earth surface, *e. g.* dry soft soil, hard rocky ground, the angle of maximum radiation is raised. Another angle which is known as Brewster's angle, and named after Sir David Brewster (1811), and which is otherwise referred to as the critical angle of incidence for vertically polarized waves comes into being, and determines the lowest angle at which radiation occurs. *Fig.* 6 shows the average Brewster angle for a quarter-wave aerial over normal ground.

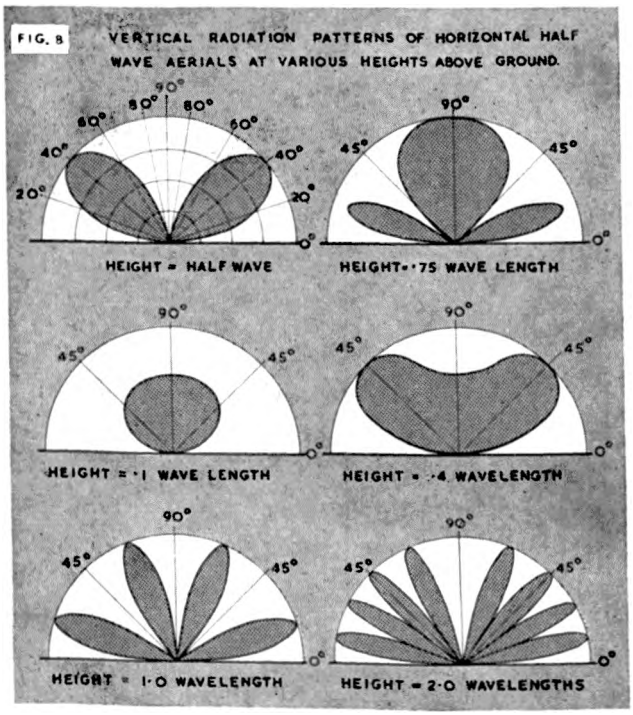


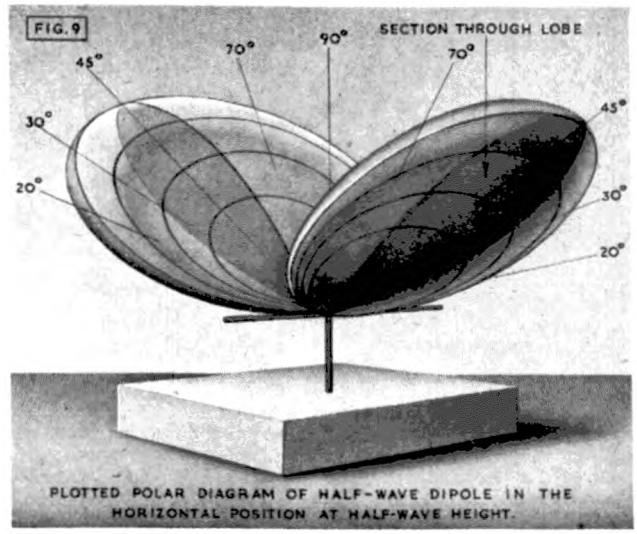






This critical angle applies to all vertical aerials and *Fig.* 7 shows the patterns for other types and heights. With horizontal aerials the effect of earth is not so marked and the theoretical patterns are changed very little except that the vertical radiation is raised a little over very low conductivity




ground. The horizontal patterns remain unchanged for both types of aerial being effected only by reflection from nearby metallic objects of resonant length, *e.g.* metal roof tops, telephone lines, etc., etc. This is due to in and out phase reflected radiation producing cancellation at certain angles in the main horizontal lobe or lobes. The vertical patterns for a horizontal dipole at various heights above ground are shown in *Fig.* 8. The horizontal pattern for a horizontal dipole at any height remains approximately constant as shown in *Fig.* 9, which is an example taken at half wave height above ground.

## Conclusion

For the Radio Control of Model Aircraft it is essential to have radiation occurring all around the aerial and with equal amplitude, and the present popular quarter-wave vertical aerial is from the point of view of simplicity probably the best to use. Horizontal aerials would present many difficulties due to the greatly varying radiation at different angles in both the horizontal and vertical planes and also because receiving aerials assume the same properties as transmitting aerials as far as their polar patterns are concerned. The writer is at the moment employed on the development of a suitable beam aerial for vertical operation, and for use on 465 Mc./s, a frequency which lends itself more readily for high gain aerials of small physical size. It is hoped later to publish details of Radio Control equipment for operation at 465 Mc/s. together with some designs for efficient aerials for both transmitting and receiving. Due to the extremely complex nature of aerials and their radiating properties only a fraction of the theory and practice of simple aerials can be covered in an article of this length. Interested readers are therefore referred to the standard handbooks on the subject, but it is sincerely hoped that the foregoing may prove to be of some value.

*REFERENCES.*

The Short Wave Magazine. January 1950 article.
*Ref.* 1. The Theory of Similar Aerials, by F. C. Judd, G2BCX.
*Ref.* 2. The A.R.R.L. Handbook. U.S. publication by the American Radio Relay League. (Obtainable in this country).
The Admiralty Handbook. Vol. 2., Section R, 1938. Published by H.M.S.O.

*Other works of reference.*

The Radio Amateurs' Handbook. Published by The Radio Society of Great Britain.
The A.R.R.L. Antenna Manual. Published by the American Radio Relay League. (Obtainable in this country).
The two American publications mentioned above are obtainable through the Radio Society of Great Britain.

# The BILL WHITE MEMORIAL CUP and BLACKHEATH GLIDER CUP

*Top Left: C. Bonsey of West Middlesex launches clubmate Jim Plank's APS "Satu" Nordic Glider. Centre: Croydon Chairman, J. L. Pitcher congratulates H. Savage (right) on winning the glider cup, and a handsome timepiece given for first place, Right Upper: St. Albans Clubmen try to form a windbreak for Georgey Fuller as he prepares his Lightweight.*

*Right: R. G. Harris of Regent's Park club flew this twin finned hatchet design of his in the Glider Cup. Known as Clancy, the job lowered the boom too far to place in the results.*

*Below Right: Ruislip clubmen found recovery of this Yeabsley design a three man job in windy conditions.*

*Bottom Right: Phil Guilmant has completely inverted the fin on his 1951 version of the Norseman. The upper portion is blanketed during the tow and only becomes effective as a trim tab when off the steel towline.*



*Above: P. B. Wyatt of Ipswich made his mark in the 1950 power contests, and appears to be out for a place on the A/2 team for 1951. His unique glider has an all sheet wing (tissue and ribs on the underside) and high aspect ratio lifting surfaces. Dihedralled tailplane requires only a small fin, and tips up for d/t.*
*Below: Roy Clements entered both Rubber and Glider, netting third place in the latter. Shown here wrestling with his Wakefield during a gusty launch, Lutonian Roy appears to be wondering which way the prop is rotating!*

AFTER a rather bleak Christmas, whitened by snowfalls in many parts of the country, Old Man Sol turned away the clouds on the first Sunday of January, and gave a clear sky for the Blackheath Club's open contests for their glider cup and the much valued Bill White Memorial. Supported from parts afar as Ipswich, Luton, St. Albans and Sale, plus most of the London area clubs, the comps. unfortunately developed into blow-outs. A strong wind persisted throughout the day.

In the first hour, Laurie Barr and Ron Warring were among the many to call for the dust pan, whilst the Yeabsley brothers sent Roy's "Revenge" off to disappear with the wind o.o.s. despite D/T operation.

1951 Wakefield designs were obviously and wisely kept beneath the wraps, awaiting calmer weather (false hopes, perhaps—the next event is the renowned (D) Gamage!). The Glider boys were more venturesome and several new A/2 jobs showed their paces. Influenced no doubt by the Revenge, one or two models displayed inverted fins. From Ipswich, power wizard (now tailless as well as pylon) P. B. Wyatt achieved second place with a very original high aspect ratio all sheet wing A/2 that merits respect at future events.

BILL WHITE MEMORIAL CUP
(Hand launched three-flight total)

| | | | |
|---|---|---|---|
| 1st | A. Ricks | Willesden | 377·3 secs. |
| 2nd | K. J. Miller | Croydon | 306·8 secs. |
| 3rd | J. B. Knight | Kentish Nomads | 303 secs. |

BLACKHEATH M.F.C. GLIDER CUP
(Three-flight total)

| | | | |
|---|---|---|---|
| 1st | H. Savage | Croydon | 291·2 secs. |
| 2nd | P. B. Wyatt | Ipswich | 267·8 secs. |
| 3rd | R. Clements | Luton | 256·7 secs. |

# "See You at Eaton

## PROSPECTS OF THE 1951 BRITAIN'S ONLY MODELLERS

*Aeromodelling campers prepare their models for flying on the sun porch of one of the 90 ft. dormitories.*

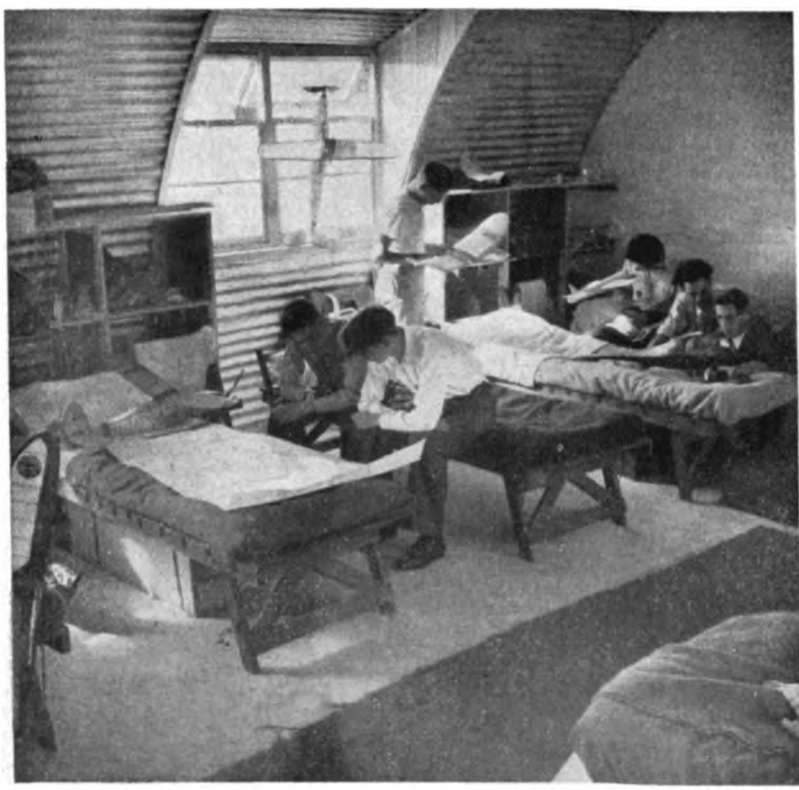
FOR the first time in its six years existence, Eaton Bray Sportsdrome will be entirely free of anti-modelling obstructions in the 1951 season, opening officially at Easter. Now that we are able to offer full use of the 75 acres of grassland without barbed wire entanglements or the belligerent presence of the local bull, our policy can revert to that originally announced in 1944 of providing a suitable open space *for the exclusive use of modellers*. Agricultural requisition of part, together with the long continuing petrol ration, made it essential that we sought other means of gaining revenue in past seasons, and in consequence organised motorcycle racing, pony racing and gymkhanas were staged from time to time which often happened to coincide with aeromodelling visitors who were unable to fly for the greater part of the day.

These events will not be interfering with their enjoyment in 1951, when from Easter onwards we shall be keeping open house for our visitors.

The growing tendency amongst local authorities to ban or limit aeromodelling activities in parks and open spaces under their control encourages us to hope that the existence of one little plot of England where a welcome is always there for model flying will come to mean more and more to harassed enthusiasts.

In case 75 acres does not mean very much to our readers we would point out that the boundaries of our aerodrome are from 600–650 yards long, with about half-a-mile across the diagonal: shape being roughly rectangular. There is ample room for control-liners to come along in as strong a force as they wish, while for radio-control flying we have yet to find a better spot. Models flying out of the field can be seen for several miles, and usually follow certain regular paths according to the prevailing wind. Our relations with neighbouring farmers are cordial, and providing retrievers show a fair appreciation of other people's land, crops and so on, there should be no difficulty in recovering o.o.s. models.

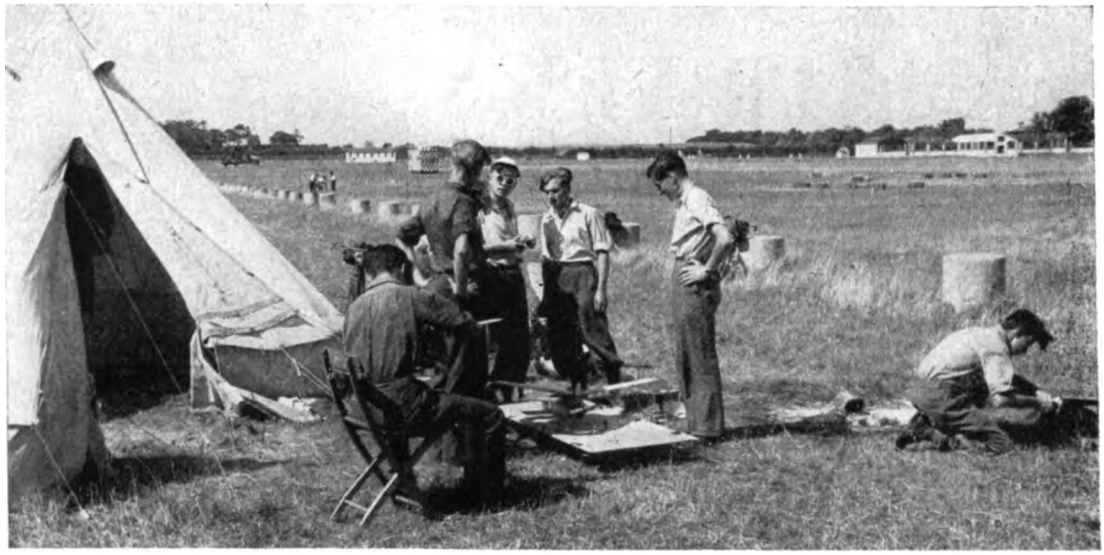
Now just what can Eaton Bray offer that you cannot get elsewhere? First of all—and that *is* important—a welcome: you will not be here on sufferance but because we like to have you! Then there are camping facilities if you care to bring a tent and make a week-end of it. Meals can be provided without any effort on the part of visitors—or they can cook for themselves—it is a free and easy atmosphere. For those who prefer a roof over their heads, a " bed and breakfast " service is available at any time from Easter onwards in comfortable dormitories with spring beds, sheets and all home comforts, including adequate toilet facilities, hot water and shower baths. A limited number of single and double rooms are also available to accommodate family groups. These are shut off from the main dormitories



*Dormitory scene at Eaton Bray. Visitors are provided with cupboard and shelf accommodation plus the company of other enthusiasts.*

# Bray"

## SEASON AT RENDEZVOUS



*Here are campers who have brought their tent—and a good-sized tent at that ! — provide their own meals and enjoy the cheapest of aeromodelling holidays*

and enjoy separate shower and toilet provision. For casual visitors for the day or afternoon there is full catering and further toilet facilities.

Admission charge is 2/6d. per day—dawn till dusk. Accommodation and refreshment charges are moderate, and are fully set out in a leaflet available on application to the Aerodrome, Eaton Bray.

Creature comfort having been considered, what is there for the model flyer ? Concrete take-off discs are available for r.o.g. flying, there is a mobile public-address system and control tower to regulate such things as a superfluity of would-be radio-control flyers all trying to get off at once, or to organise spontaneous contests should visitors desire them. It is not our intention to run any big rallies this summer — a glance at the official contest programme shows there are more than enough throughout the country to please the most contest-minded. Our approach is : " Here is an aerodrome—come in, have a good time with a minimum of control—fly as much as you like, do what you like : and come again ! "

There can be no doubt that local clubs will continue their past support : lone hand flyers will find it a splendid opportunity to widen their knowledge of what the other fellow is doing. For club flyers we would recommend one or two organised motor coach trips during the season. We should be delighted to organise occasional inter-club contests in this way, where two or more coachloads from different areas meet together for a friendly all-comers inter-club contest. Impromptu events on these lines have always gone down well, and would not prevent any other users from still enjoying themselves on other parts of the aerodrome.

For those interested in modelling apart from aircraft, we would remind them that model car racing events take place throughout the season, and the track can always be rigged up for cable-track car racing. By Easter too it is hoped that the largest rail-track for model cars in the country will be ready for use. Here for the first time it will be possible to race four cars at once over a natural course with a hill climb, curves and a hairpin bend nearly five hundred feet in length.

As a final thought on Eaton Bray we should like to quote from a letter Alec Wilson sent us after last year's International Meeting : " . . . one of the most enjoyable series of competitions I have yet attended. Although bad weather made good flying difficult, nothing could dampen the cheerful friendly attitude of the competitors, and I was proud to be a member of this happy band. To those who have not visited Eaton Bray recently, the improved flying conditions, and other facilities were most noticeable."

Come along and join the " happy band " this season !

*Despite the provision of workshop space we find all visitors much prefer to model in the dormitories —and good luck to them !*

# WORLD NEWS

BY

## ARIEL

*Our heading photograph takes a truly International flavour with Britisher T. E. Hindell from Battersea and Brazilian B. Hacke, ironing out engine bugs on the latter's E.D. Bee powered Keil Kraft Pirate, at a contest in Germany.*

### Germany

From Hans Pfeil, our correspondent at Bad Pyrmont in the British Zone, comes a report of the first Post-War Power Model Contest since the ban on power flying was lifted last September in the Western Zones. Held on the 15th October, this Contest was organised by " Werkgruppe Cumulus " of Uelzen in N.W. Germany.

The majority of contestants used British engines of the most popular makes, while three American motors were seen, and, of course, a considerable number of German petrol engines—now glow-plugged—and German Diesels of Kratzsch and Eisfeld manufacture.

A considerable number of metal propellers were being used with diesels, with the unpleasant results which have been experienced elsewhere with this type, and a few plastic props. put in their first appearance.

Our correspondent noticed that 60 per cent. of the models flown had no timing device of any sort, and those which did have, were not particularly effective.

The Rubber Class Contest was not particularly impressive, the winner being Herbert Strauss of Bremen, whose model, though well built and flown in an experienced manner, did not manage a flight of over 1 minute, 32 seconds. This same contestant placed third in Class B Power, with a model of his own design, which was a good performer, but suffered the disadvantage of being powered by a " Grandfather of a Kratzsch Diesel ". This Class was won by Freihdorf, of Uelzen, with an E.D. Bee-powered K.K. " Pirate ".

The Control-line Event, in which there were 9 competitors, was held on the town meadow. A large crowd cheered the winners, and Serg. Stephenson of the British team, from Fassberg, well deserved top place. His models—a "Junior Monitor " Elfin-powered, and a " Millsbomb " Mark II with a similar motor—plus a Veron Spitfire—put on a most impressive show and he was the only contestant to fly successful eights. Stampa, of Fassberg, took second place, with a Kratzsch-powered " Defender ", which had a very lame performance compared with that of the British team models.

Top marks to the Uelzen Club for the organisation of the Competition and for the successful Prizegiving party which followed it.

The latest news of Hans Pfeil's own Club—The Pied Pipers of Hamelin—is in connection with their own Control-line Show which was put on on the 26th December last. Quite apart from some notable flying, the Chairman of the Club, R. Reichelt, did the feat of the day by blowing off the complete cylinder of his glow-plug Kratmo Ten Engine, which was installed in a 50 in. span stunt model.

Much of the applause was stolen by a cream and white F.W.190 with its realistic looks and performance.

Between January 13th and 17th the newly-formed German Aeroclub at Frankfurt-on-Maine, in the U.S. Zone, will have endeavoured to enlist the aeromodellers in their ranks. As this would mean that one modeller's representative would be alone on a board of sailplane pilots, the modelling side of the Club would not be much in evidence. The majority of German aeromodellers would rather form a governing body of their own, as they can visualise the hobby being completely engulfed, if it is to be run by the Aeroclub. We have yet to hear the latest position in connection with this situation.

### Malaya

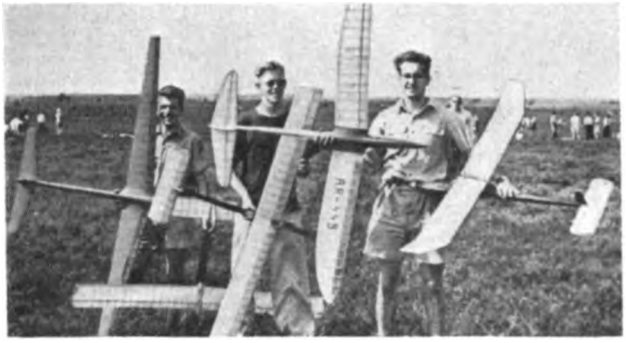
Ron. Moulton, of AEROMODELLER Staff, received a letter from his friend, Flt. Lt. Hedges, who is with the R.A.F. in Singapore, flying Bristol Brigands. He is a very keen Control-line Speed man, as many modellers who were at Radlett when he took the Skyleada Trophy will remember. At the time of writing, his latest job was McCoy 49-powered and had been checked with a chronometer over two lots of three laps at a speed of 152 miles an hour. He sent in a photo of this model, and readers will see that it has the right sort of appearance !

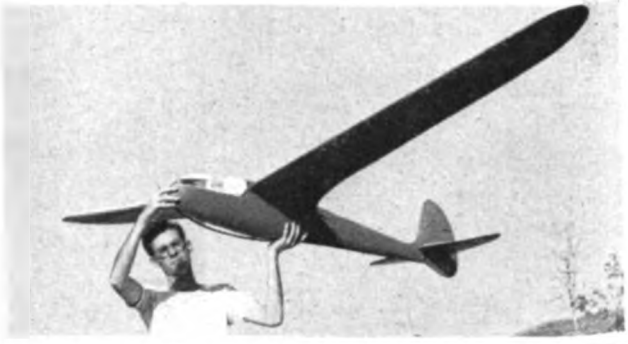
Jim Hedges does not limit his flying to speed, however, as he derives considerable enjoyment from a Monitor, and has been known to put up a sailplane also. He has very few complaints regarding service in Singapore and its connection with modelling activities, as he finds plenty of time to keep up his flying.

### U.S.A.

Photographs and details of the most amazing collection of flying models that we have yet seen, have been sent over from

***Flt./Lt. Jim Hedges (known to his compatriots as Hot-Rock), now stationed in Singapore, is seen displaying his " Glowing Places." He hopes to bring this fast model to England during May this year.***





New York by Francis X. Gruber. The majority of his private collection of unorthodox flying machines are his conceptions of the " Flying Saucer ". The largest, however, which has a span of 48 ins., is a tailless Towline Glider, as is the Flying Wedge of 24 ins. span. The large flying discs are Jetex-powered, 31 ins. in diameter, and are Control-line Models. They use catapult-assisted take-off and have quite an impressive performance, ending with a fast, though flat, glide. The disc at the rear of the collection is also a Controliner, and is powered with a Mini-Jet. This is a heavy model, which flies very fast and writes off its landing-gear pretty regularly !

To prove that these things really do fly, their designer included a photograph of one of them performing, but the results were somewhat too hazy for reproduction. This, however, is excusable, as he took the picture with his right hand, and launched the model a second earlier with his left. However, it definitely *is* flying !

## New Zealand

We were so amused by the style of a report written and sent in by Pete " Tailskid " Carter, Editor of the Balsa Butcher's Bulletin, official organ of the Hutt Valley Aeromodellers, that we would have liked to have given you the whole thing. However, space will only permit chosen extracts, and we will do our best to do justice to its author. The report starts like this :—

" Well, it's like this. We pile on the early train and get to the 'drome about ten-thirty to find the breeze piping up and Freeman's castor oil all spilt in his bag. The way that joker controls his language is something amazing . . ."

" Roots is flying that dirty big ugly trike again—pity it flies like a brick, or he might lose it and have to build something decent. Just then Jarvis tries to kill me with his Monster—it whistles past my ear at about 60. Lethal weapons like that should be banned. If he wants to do me in, why doesn't he try frightening me to death with his Wakefield or something ? Just as I think I've had a lucky escape, I get hit in the eye by a hunk of tailplane off Randall's model what Freeman is chucking around like a madman, so I retire to the sideline . . ."

" Suddenly there's a devil of a roar and the world is informed that Freeman's got his jet going. Everyone panics and clears out and forgets to unhook the pump and batteries and if it hadn't conked out I reckon she'd have taken off with the lot. They have another go and this time it's highly organised with about sixteen jokers hopping around like one-armed paperhangers trying to wrench leads and pumps off. Barret's flat out on his tum trying to hold it back, and just about to get his eyebrows burnt off. Only Freeman's laundry knows how scared he was ! !"

There is quite a lot more in similar vein, but we have to pass on and do so with the hope that at some time in the future we can give you further extracts from a Balsa Butcher's Bulletin.

Pete Carter is also the local tame Magician, and a very useful type to have around at Club Dinners and such like.

*Top left ; Dutch sailplane enthusiasts Y. F. Yekking P. Koorn and L. Bausch with their A/2 models. Top right ; Amos Yatom of Haifa, Israel, with his 10 ft. span radio controlled slope soarer. Above and right : the collection of unusual models by Francis X. Gruber of U.S.A. takes some beating for originality. These are the first flying doughnuts we have seen !*

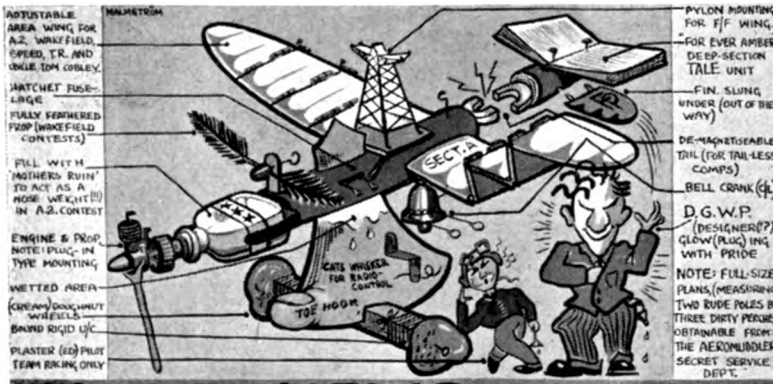
## Israel

Some interesting information is to hand from N. Kadmon, of Jerusalem, regarding Israeli aeromodelling. Apart from being a hobby, as elsewhere, the building and flying of model aircraft is used officially to engender airmindedness in the youth of the country. Their A.T.C. begins with model gliders and a few rubber jobs at the age of 15. At 16-17 the more advanced members pass on to full-scale gliding and power flying. At school-leaving age of 18, they are then qualified to join the Air Force. The majority of the A.T.C., both boys and girls join the Aero Club of Israel, where their model building continues, while they learn the theoretical branches of aeronautics, and continue full-scale gliding.

For the above reasons, Israeli modelling has developed around a number of standard models, several of which have been designed especially by Shlomo Yarkoni, a chief instructor and Israeli Air Force pilot, whose name has appeared in " World News " previously.

Accent is on gliders, of up to 11 ft. span, including Tailless, with Free Flight Power in second place, and Rubber, due to the shortage of that commodity, poorly supported. Our correspondent, who is chief modelling instructor of the Israel Aero Club (a summer vacation job, he tells us), is, however, a rubber enthusiast, and looks forward to the time when Israel will have its own Wakefield Team. Power models favour the 1 to 2 c.c. capacity motors, British designs being the most popular, closely followed by those from the U.S.

Dr. Sultan, of Tel Aviv, has just perfected a single-blade prop. for one of his diesels, which he claims to give more thrust than a corresponding two-blader.




AT last the veil of secrecy can be lifted from the wondrous Fliar Phil "Uniplane"—1951's most potential winner, to be first flight tested in the Damage Cup this month. Hope you like it bods! It is the result of many hours of balsa bashing into the candle-light hours. Note how your favourite scribe has kept himself abreast of other experts, Evans, Smith, Gorham and the Knights, by using the very latest style in feathering props. There'll be a strong smell of ammonia around if the D/T ever gets mixed up with those prize Duck bristles F.P. uses for super efficient blades. Complete in every detail and ready for every modelling affray of the year, the Uniplane should make its mark (!) wherever it appears.

Remember that article on a Wilmot-Mansour Turbo Prop. unit using a Jetex Motor? L.S.A.R.A. member R. Sharpe, designed and photographed this month's feature of the month during late 1949, and was assisted by A. G. Levers in the construction. The Jetex unit is fitted with a special nozzle and screwed into the turbine casing. The stream of high pressure gas from the Jetex drives the turbine, which, in turn, drives the prop. Designer Sharpe would like to hear of other experimenters in this interesting sidelight on Jetex power. Though little theory is available on design detail, the unit illustrated is capable of equalling the thrust of the renowned Mills ·75 c.c.

The beautifully finished "Ercoupe" shown as picture 2 comes from J. Greening of Dorchester, Dorset. As a first attempt at building from plans, it reflects credit on Mr. Greening's building—and photographic abilities. Power is by Amco 3·5 diesel.

No. 3 in the picture parade is an Ed Stoffel shot of N. Griffiths' 75 in. span Feiseler Storch, powered by a 4·4 Kemp diesel. Finished in proper colours, the model was scaled up from an AEROMODELLER 1/72nd drawing, and has excellent flying characteristics.

Once more Fliar Phil includes a team racer in the dual picture, No. 4. A product of S. J. Higgs of the Gosport Club, "Lumberin' Lucy" was built to rules formed by that club some time back. Span is 16 ins., area 53 sq. ins., weight 7 ozs., and with the Allbon Javelin 1·49 its average speed is 55 m.p.h. Note the very neat inverted motor installation, and its centrally split hinged cowling. The entire model is built from ¼ in. and 1/16 in. sheet, and is finished red with yellow trimming. The photographs were taken by Mr. Blamire, camera was Voigtlander Bergheil plate with f4·5 Helliar lens. Exposure 14 secs. at f22.

Not the kind of job to fly in mad March winds, but nevertheless a very successful contest lightweight is "Mimico Maid" in No. 5. Here B. L. J. Neal of West Middlesex is shown with his "Maid". Span is 29½ ins., area 125 sq. ins., weight 3¼ ozs., and power 6 strands ¼×1/24 in. rubber. Photograph was taken by H. W. Hyde, using Pan X cut film, 1/50 sec. at f11.

A Summer scene at any contest is No. 6 by K. A. Farmer of Bristol. John Mayes (left) and T. Smith of the South Bristol M.A.C. are seen preparing their modified Toreador for flight at Lulsgate Aerodrome, Nr. Bristol. Camera, a Rolleicord II, Pan X film 1/50 at f8.

Seventh in the line is not a solid but a control line version of the Typhoon 1b by J. G. Harding of Greenwich. Plans were scaled up from A.P.S. 1/72nd scale drawings, giving a span of 28 ins. Power is a Frog 180 and weight 13¼ ozs. With an airspeed of 40–45 this Tiffy has a very realistic appearance. Picture by J. Mace of Blackheath with a plate camera 1/5th at f8.

Just to show that we have not forgotten the sailplane fraternity, No. 8 is a 72 in. span Meteor inspired sailplane, designed and built by J. Nicholson of Bradford. The model is known as "Old Nick"!!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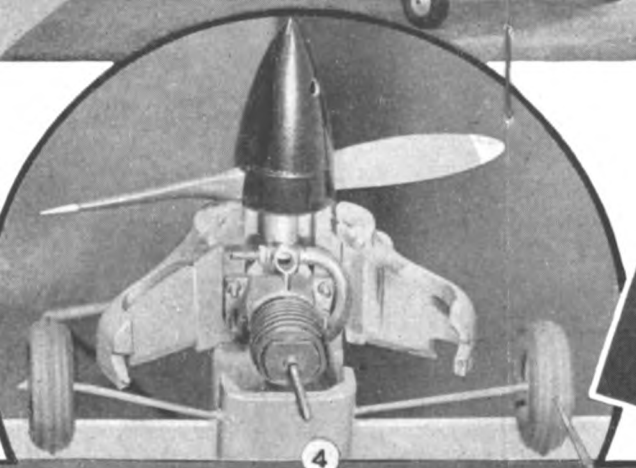

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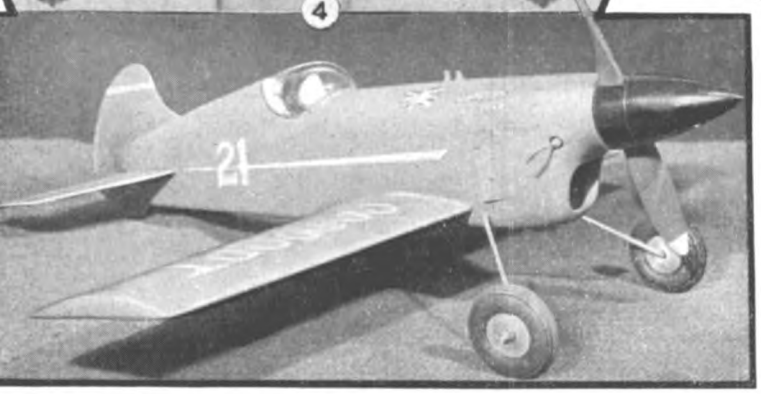


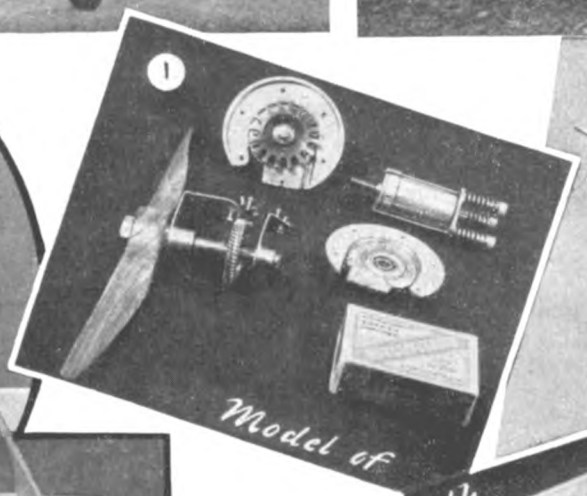



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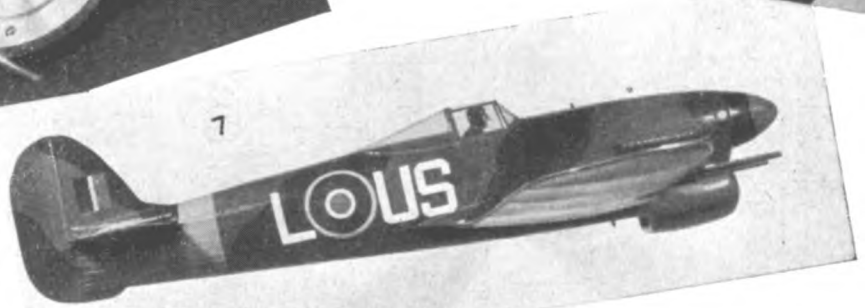


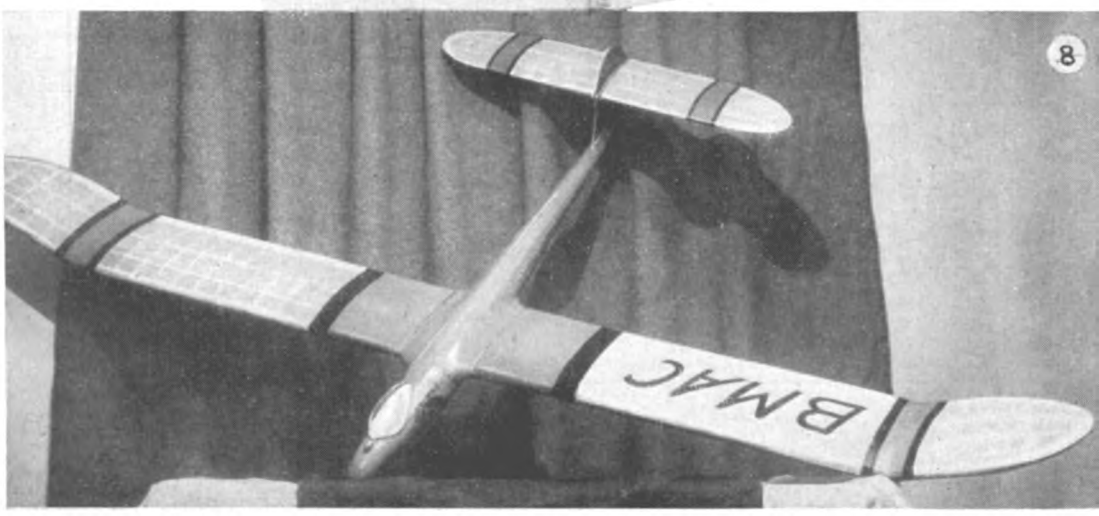


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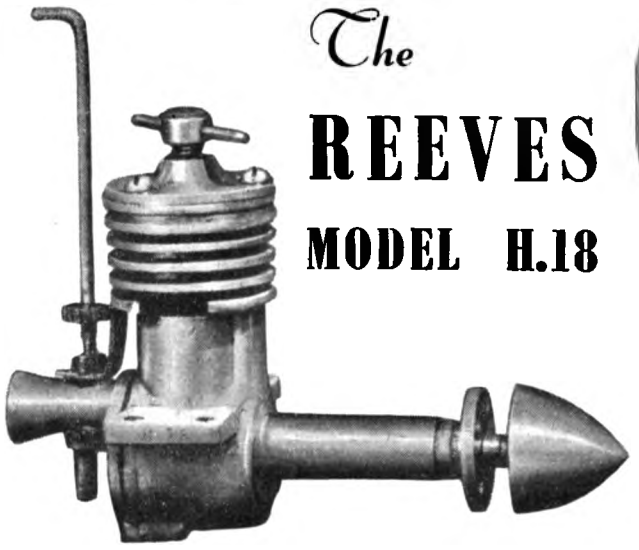


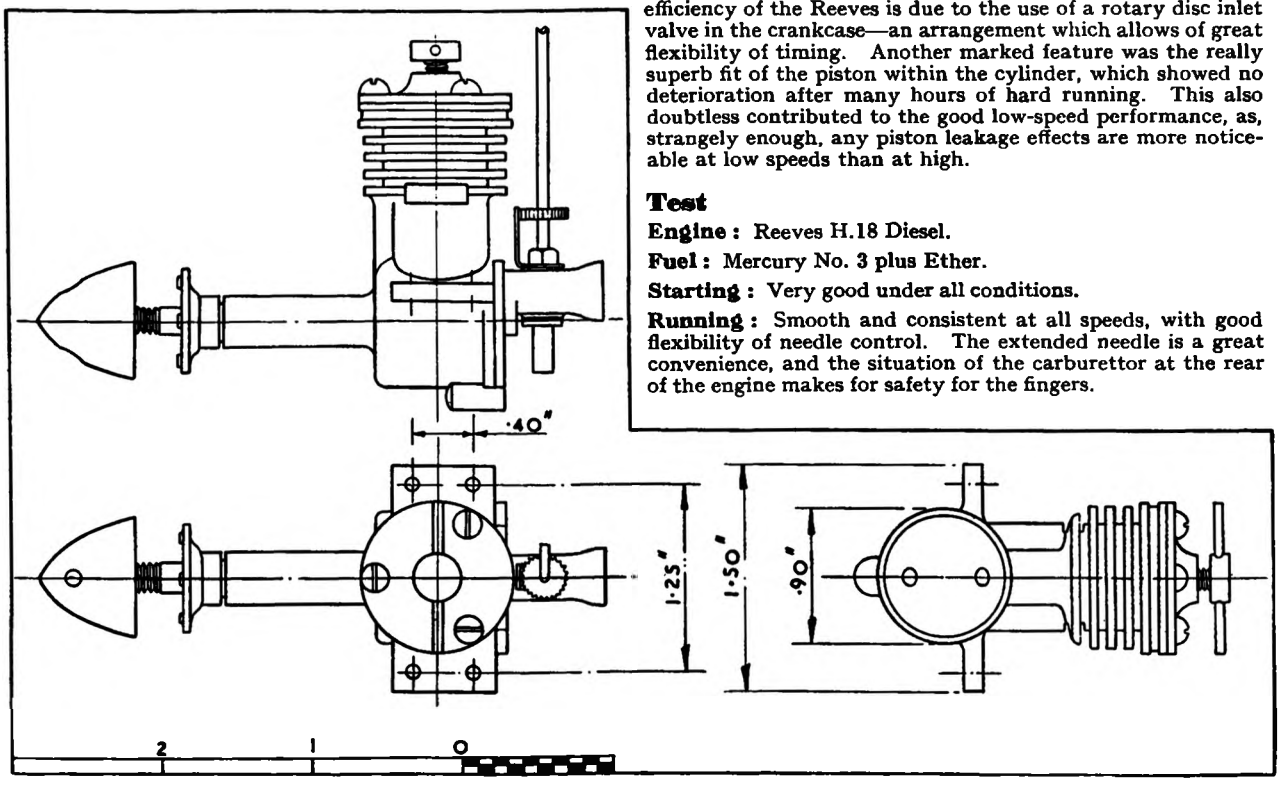
# The REEVES MODEL H.18


THIS month we again feature an engine of under 2 c.c. capacity—proving once more the popularity of engines within this category. Almost every new addition to the British range has, in recent months, been of small capacity, so that a very wide choice now exists. A likely reason for this concentration on units of small size is the general improvement which has taken place in design and power output, enabling models of fair span to be flown without the necessity for larger engines.

The engines tested in the past few months certainly show that British manufacturers, once they have got under way, are capable of bringing their products to a high state of perfection, so that the British-made diesel engine is now undoubtedly the finest in the world. It is particularly noticeable that the small breakdowns and petty troubles which beset some of the earlier engines have quite vanished away, and the miniature British engine is now as reliable and " wear-worthy " as its full-sized counterpart.

Generally speaking, I should say that these improvements are mainly due to the use of correct materials in the *right places*, the increased employment of hardened and ground parts, and a better appreciation of the precision necessary to an efficient engine. On the design side, engines of higher efficient speed have been evolved by short-stroke lay-outs, improved porting arrangements, and more careful timing. Fuel developments have also kept time with mechanical advance.

In the Reeves H.18 many of these points will be evident, and on test an extremely good performance was obtained. Probably the most marked feature of this engine was the very excellent output at the lower revolutions, for, as the curve shows, ·067 b.h.p. was obtained as low as 5,000 r.p.m., although the maximum power was developed at a considerably higher speed. This characteristic is unusual in " hot-stuff " engines, because high-efficiency porting usually behaves well only at around the high speeds for which it is designed. We thus usually find a very marked drop in power around the 4 to 5,000 r.p.m. mark. It is probable that the good over-all efficiency of the Reeves is due to the use of a rotary disc inlet valve in the crankcase—an arrangement which allows of great flexibility of timing. Another marked feature was the really superb fit of the piston within the cylinder, which showed no deterioration after many hours of hard running. This also doubtless contributed to the good low-speed performance, as, strangely enough, any piston leakage effects are more noticeable at low speeds than at high.



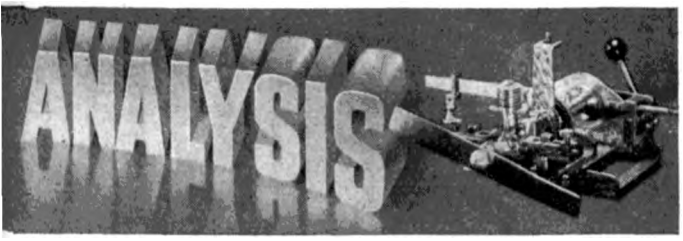

## Test

**Engine :** Reeves H.18 Diesel.

**Fuel :** Mercury No. 3 plus Ether.

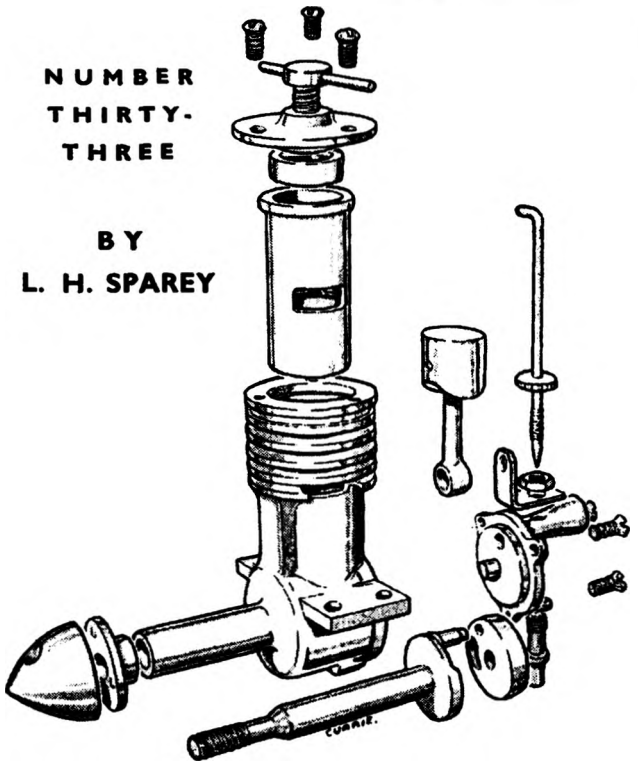
**Starting :** Very good under all conditions.

**Running :** Smooth and consistent at all speeds, with good flexibility of needle control. The extended needle is a great convenience, and the situation of the carburettor at the rear of the engine makes for safety for the fingers.




NUMBER THIRTY-THREE

BY L. H. SPAREY



**B.H.P.:** As mentioned, a rather unusual performance was evident at the lower speed range. At 4,000 r.p.m. the output was as high as ·060 b.h.p., which rose steadily to a maximum of ·1034 b.h.p. at 11,700 r.p.m. Although dropping rapidly, a power of ·087 b.h.p. was obtained at about 13,000 r.p.m. The engine may be considered to be performing excellently at any speeds between about 9 to 12,000 r.p.m.—a wide range of variation.

**Checked Weight:** 3·25 ozs. (without fuel tank).

**Power/Weight Ratio:** ·510 b.h.p./lb.

**Remarks:** This engine seems satisfactory from all points of view. The hardened cylinder and liner, the hardened and ground crankshaft, and the long main bearing, should make for long wear. Engine controls are particularly well placed for convenient handling.

## General Constructional Data

**Name:** Reeves H.18.

**Manufacturers:** Reeves Model Power Units, Victoria Road, Shifnal, Shropshire.

**Retail Price:** 62s. 6d., including purchase tax.

**Delivery:** Immediate.

**Spares:** Full spares and repair service by return of post.

**Type:** Compression ignition.

**Specified Fuel:** Equal parts paraffin, oil and ether, or Mercury No. 3.

**Capacity:** 1·77 c.c., ·102 cu. ins.

**Weight:** 3 ozs. bare.

**Compression Ratio:** Adjustable.

**Mounting:** Beam, upright or inverted.

**Recommended Airscrew:** 8× 6 in. or 8×8 in. for control line. 9×4 in. for free flight.

**Bore:** ·510 ins.

**Stroke:** ·500 ins.

**Cylinder Liner:** Case-hardened steel, ground honed and lapped.

**Cylinder:** Aluminium alloy casting, one piece with crankcase and integral fins, two exhaust ports and one transfer duct.

**Cylinder Head:** Plain aluminium alloy with three retaining screws.

**Crankcase:** Aluminium alloy casting.

**Piston:** Flat topped, case-hardened steel, ground and lapped, no rings. Silver steel gudgeon pin.

**Connecting Rod:** Case-hardened steel, ground and lapped.

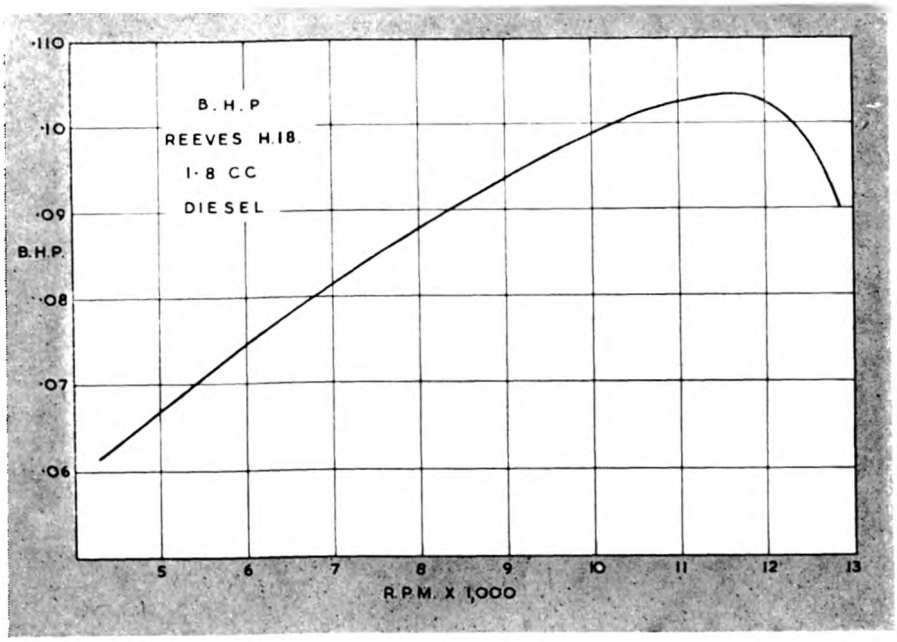
**Cranksnaft:** Case-hardened steel, ground and lapped.

**Main Bearing:** Plain.

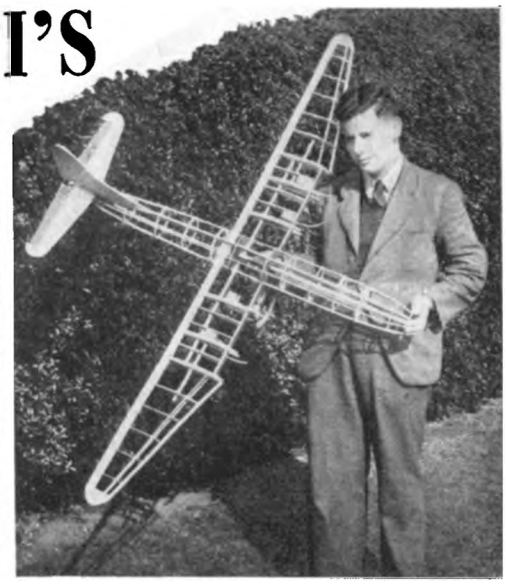
**Induction:** Rotary disc valve.

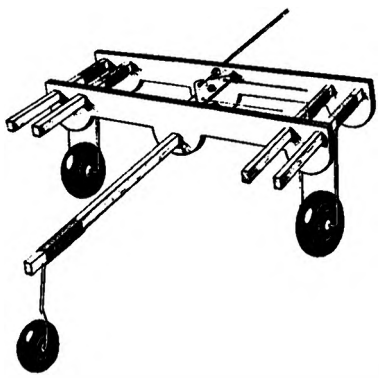
**Contra Piston:** Case-hardened steel, ground and lapped.

**Special Features:** Extra long crankshaft bearing giving engine longer life. Anti-vibration carburettor needle. Will run in any position without any alteration to engine.



# CONTROL-LINE MULTI'S





*Above : The mighty 'Brab' in miniature is an impressive model. Lightweight structure is planked over ; engine nacelles removed for flight. R. H. Thorne's multi-mount is shown left. Fuselage and wings can be built around this basic unit.*

MULTI-ENGINED aircraft have often been chosen as subjects for sports control-line flying, so we make no pretence that the models featured here are breaking new ground (literally, not physically).

However, the enterprise among Brabazon I enthusiasts who have sent us photographs of their scale versions of this mammoth aircraft is best exemplified by the first photographic evidence of a FLYING Brabazon sent by K. Goodchild of the Wolverhampton club. A team effort by Messrs. Bell, Cliff, Goodchild and Wrights, Senior and Junior, produced the successful job shown here, in the five months from February to June, 1950.

Power is supplied by four sidewinder K Kestrel 1·9 c.c. diesels driving 6 in. × 6 in. props, and using extension shafts. Four separate wedge tanks feed fuel, and the outer wing panels detach to aid transportation (span is 69 ins.).

Flown on 50 ft. lines, this Brab in miniature took off for its first flight on two engines after a run of ¾ lap—top speed on all four is about 50 m.p.h. and the take-off reduced to ¼ lap. With one motor only, a ground hugging circuit at 12 m.p.h. is the best the 5 lb. all-up weight will allow. The wing area is 440 sq. ins. and the length 52 ins.

From Richmond, Mr. R. H. Thorne specialises in scale multi's, as the pictures of the Sea Hornet, Convair and Manchester show. Advising fixed undercarts mounted on a unit which can fit almost any design and is suited to nose wheel designs, Mr. Thorne employs upright mounting of his E.D. motors.

The unit consists of a short front and rear wingspars through each of which are thrust the engine bearers. Plywood, an ⅛ in. thickness, is the best material to use and the bearer holes can be cut with a fretsaw. The block for the bellcrank is also mounted between these spars. Every joint is fixed with strong glue. The undercarriage legs are bound to the bearers. If the model is to have tricycle undercarriage the nosewheel can be bound to another length of wood also fitted through the spars. This unit makes up in strength and ease of construction for the little extra weight, and with modification could be used with radial mounted engines.

The De Havilland Sea Hornet has one E.D. 2 c.c. Competition Special and one E.D. Mk. III 2·49 c.c. They can each fly the 40 in. model, should one or other motor fail in the air. The larger Convair flies on 75 ft. lines, using the same motor combination as the Hornet. Note that in each case the more powerful motor is fitted on the inboard nacelle to help keep the lines tight in flight.


### "More Revs."

*I've noticed of late a considerable entry*
*Into our hobby of Clerical Gentry,*
*Seeking diversion from the saving of sinners*
*In giving instruction to model beginners.*
*Of course, we've had Doctors and Lawyers and such,*
*But it's pleasant to welcome the reverend touch.*
*Though I'm somewhat amazed that they should exult*
*In our far from religious, and pagan-like cult,*
*Where the Sabbath is flouted and given to rites*
*Of heathenish revels and devilish flights.*

*So much for conjecture, but let me relate*
*The story of one—a learned prelate—*
*Who, starting his engine, gave demonstration*
*To a very attentive and large congregation,*
*Whose purpose, no doubt, was merely to linger*
*To hear what he said when the prop hit his finger.*
*Which finally happened—but I state without libel*
*The words that he uttered can be found in the Bible.*

L. RANSON.

## — and the other view

### "Less Fuel"

*Your surprise, Mr. Ranson, I've noticed in others*
*Who seem to imagine their reverend brothers*
*Should live in a sort of perpetual Lent,*
*And that modelling's not for the clerical gent.*
*But against Sunday flying and similar revels*
*The voice raised the loudest is surely the devil's :*
*It wouldn't surprise me to hear that he barks*
*In the ears of the keepers of public parks.*
*This modelling business must ruin his trade—*
*Hence the latest attack through P.T. that he's made.*
*Below, he's an army of out-of-work stokers*
*Wasting time leaning on shovels and pokers*
*With nothing to work on ; while poor human souls*
*Are too busy flying to turn into coals.*
*For when anyone's working with balsa and plan*
*He's unlikely to leave them to murder his Gran !*
*Here's hoping the ranks of our hobby will swell,*
*And the devil (plus stokers) can all go to*—the
Ministry of Fuel and Power for a coke permit !

F. CALLON.

## Wakefield Selection

DEAR SIR,

The Swansea Aeromodellers' Club is very perturbed over the continued plugging of the "selection board" method for the election of the Wakefield Team. It is noticed from the December issue of "Model Aircraft" that this idea now seems to have some official backing.

It is sincerely hoped that this is not the case. The Wakefield is a contest for individuals, and the International aspect merely emphasises this.

The present method of selection seems to be very fair—it gives the "has-beens," "neverwasers," the "up-and-comers" and the fliers who fly for the sheer love of the sport a chance to make the grade. To suggest that the "Man in the News" should be given just that little extra time and peace of mind to build a still air machine is carrying things a bit too far.

Had the teams of the past consisted of these so-called experts, this country would still be waiting to get its name engraved on the Trophy. Most past winners have been people who came on the scene unheralded—they have just been good fliers ! The names of Chesterton, Judge, Ellila, Cahill, Korda, Allman, Light and Fillon come to mind. Most of these have now slipped into obscurity from the Wakefield front.

It is sincerely hoped that the spirit of competition will continue and that those people who are shouting for a "fixed" team will think again. Perhaps after all they are only the back-seat drivers who always know what to do, yet never do it themselves !

Yours faithfully,
E. C. CRUMPLIN,
Hon. Sec. Swansea Aeromodellers' Club.

*(We would refer to the last paragraph of our "Olympics" remarks on page 12 (January issue). Editorial support or otherwise is not necessarily an official attitude. We do, however, heartily endorse the Swansea chap's remarks, for we shall always fight to the bitter end any suggestion of a selection board for such matters, no matter how good the "short list" may be.*—ED.)

## That Soapsud !
## ——Was No Bubble !

DERE SIR,

i yaf with som dificcultie bilt the Soap Sud fromm the planz on pay 765 off the AEROMODELLER.

I wood hear lyque to stait mi objequshons to the dizyn. Ferstly the longrons wer dificcult to bend wonk like the planz, an keps pringin out of shayp. Orlso the T.E. of the tayl plain had 2 B carvd of solid bolser.

Sow mutch howephr 4 conn-struk-shn. i fownd that trimen woz the mayn problm. Ai fownd 5 LB groassly mutch and had to reedyuice this to mynus 2 oz (by plaissing sed 2 oz in tayl)—This ov cors wos dew too the 17½ oz Marlin spyk A yuzed 4 the noaz blok.

Unfortchunatly, the barb-wyr on the port (no starbd) typ cort on my gerl-frends dres and ripdit.

U wer rong about that third rib wot olwaiz broak, cos i found that only the senter sevn ribs crakt on lornchin.—Evenchuali it was reddi (cos of the doap) for toe ingup. I lit the navigayshun lyt an my frend ran along wiv ther toe-roap, butt it woz not attatcht to the modl and it (the modl) was burn to assh bi the navigayshun lyt. So i must start agin—hood B a neromodlr !

Kingswood, Surrey. T. LORUNTS.

*(Unprecedented demand for our Xmas funny feature design leaves us amazed at the sagacity of modellers like Mr. Lorunts and Messrs. McHard and Longstaffe who produced fool size Soapsuds shown below. Mr. A. J. Longstaffe talks of converting his (right) to radio !*—ED.)

# RADIO CONTROL NOTES

BY HOWARD BOYS

FIRST item this month is a letter from Mr. Leopold M. Kay of New York, in answer to a previous correspondent. Mr. Kay seems to have missed the writer's remarks on that letter. Mr. Kay's letter, however, contains a very good description of the working of a super-regenerative receiver. It is a bit advanced, so beginners are warned not to bother too much if they cannot understand it. There is bound to be plenty of readers who will appreciate the description. Here then is the letter :—

*It is the first time I have been moved to write to a magazine editor, but your September* 1950 *issue contains material so seriously in error that it implies a great lack of critical ability and basic " feel " for the subject on the part of your staff, at least on the general subject of radio fundamentals. This, in contrast to the unrivalled excellence of your magazine in the subjects of model aerodynamics and small engine design. In these, I feel, you are the best in the world.*

*Sir, you have been hoaxed by a fool. I refer to page* 591 *in your September* 1950 *issue ; letter from a Mr. Neutron.*

*The circuit in Fig.* 3 *may most properly be described as a Colpetts oscillator, although this is unimportant since all types of oscillator can be adjusted to produce the same results. The choke, connected to the coil, if perfect, could be moved anywhere on the coil with no effect. It could be removed if the tap were located exactly at the zero R.F. potential point on the coil—this is a detail. Feed-back for oscillation is developed by the division and phase revisal of the R.F. voltage across the tuned circuit by the ratio of input to output capacitance of the tube (valve). The circuit is, further, a self quenching super-regenerative type. It oscillates strongly at the frequency of the tuned circuit (and incoming signal). This oscillation is periodically quenched by the fact that it blocks at a low frequency (say* 20–100 *k.c.). This frequency is timed by the grid leak and grid condenser values and the operation is known as " squegging." The high frequency is approximately* $= \frac{1}{2\pi\sqrt{LC}}$ *while the low frequency is approximately* $= \frac{1}{RC}$. *In general, the grid leak should be returned to* B+ (*H.T.*). *This will increase sensitivity, reliability of operation at low values of* B+ *and decrease the effects of tube variations. It may not be optimum in the case of relay operation, where* change *in plate current is the desired criterion.*

*There is at present no completely satisfactory mathematical analysis of the super-regenerative circuit (after about* 30 *years). However, the enormous gain is caused by the following factors. Tuned circuit is proportional to a parameter* $Q = \frac{X}{R}$. $X = WL$, $R =$ *equivalent series resistance of the tuned circuit. As* $R \rightarrow O$, $L\frac{X}{R} \rightarrow \infty$. *and the gain also goes to infinity. The feedback from the output of the tube is equivalent to a negative resistance which cancels the positive resistance of the tuned circuit. The* Q *and gain rise toward infinity, faster and faster (a situation forecluding any possibility of setting the equipment to some stable operating point).*

*The circuit oscillates and becomes useless for reception, the gain drops. However, for a small interval of time just before oscillation starts, the gain is high. The squegging, causing the oscillations to die out and restart many times, causes this sensitive condition to occur again and again, and thus the average sensitivity will be high. Also, the tube, in relay operation acts as a D.C. amplifier.*

*" Rush of electrons," poo, " violent oscillation," foo, " . . . minimum current . . . less," boo, " radio practice," . . . goo. I believe that a Neutron is a very small object with no electrical qualities whatsoever.*

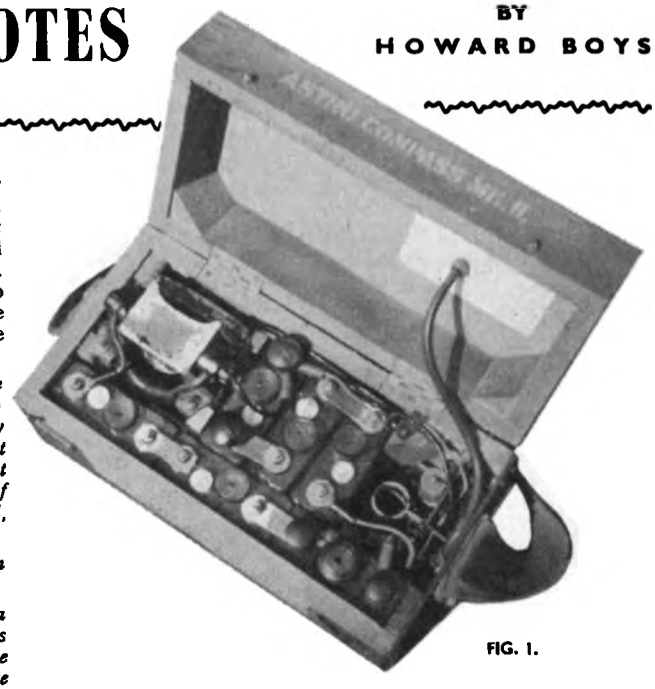


FIG. 1.

This is just the sort of reply the writer wanted in answer to Neutron's letter, and it should be a warning to people who write in that manner. Although Neutron sent his name and address it was omitted so as not to be too unkind to him. Radio people who have strong views, and have not constructed and operated model control apparatus should take notice.

Fig. 1 is a photograph of a transmitter made by a Rugby schoolboy named Roberts. It is a very good effort. The oscillator consists of a pair of RL18 valves in the usual cross connected circuit. Power is obtained from six two-volt accumulators and a 12-volt motor generator. These accumulators were made by Mr. Roberts himself from some others. Bending the cases to shape was a bit of a problem. On one occasion boiling oil was tried as the heating medium, much to the discomfort of the rest of the house ! Since taking the photograph, an intermittent switch has been fixed up on the motor generator, with a three-position switch giving " off," " intermittent " and " on." At the receiving end a motor turns the rudder by means of a screw. With transmitter switch at " off " the rudder moves to the right, with the switch " on " it moves to the left, and at " intermittent " it stands still.

Now we have a letter from Mr. Bovey of Dartmouth, describing a transmitter. Although it has not been tested in the field there is no reason why it should not work. It is a very different thing from building a receiver.

*I have been reading your " Radio Control Notes " for some time past with considerable interest, and as I have dabbled in amateur radio for about* 15 *years I have recently constructed a transmitter which I think may be of interest.*

*The oscillator, which is a Mazda PD*220, *works on the cross coupled system, and will deliver a little over* 2½ *watts when operated from a* 120 *volt H.T. battery. I have not tried a higher voltage so far, but as the valve will operate on H.T. voltages up to* 150 *without overloading, it should prove possible to exceed this figure easily. Anode current with new batteries should be about* 22 *m/a. This may seem high, but as current is only used momentarily, battery life should be quite good. Unfortunately*

*it has not been possible to give this transmitter a field test due to lack of R/C activity here, but I have hopes for next year in this respect.*

*One point in particular may be of special interest. The transmitter as originally built had an ordinary condenser for tuning purposes, but this had to be adjusted by a long piece of wood due to hand capacity effects. After some thought this was replaced by a Government surplus Split Stator Condenser, each section having a capacity of 44 pf. With the rotor of this condenser earthed the transmitter is simplicity itself to handle, and the tuning condenser can be adjusted without any movement of the transmitted signal. The 27 m/c. frequency is found with the rotor about half meshed, so the L/C ratio of the tuned circuit is high, giving good overall efficiency. The great thing about this particular circuit is that it cannot fail to oscillate, the only drawback being that frequency is affected by anode voltage. A careful check should be kept on this when operating. I intend to try a similar circuit using two 3A4 valves in order to reduce the size of the transmitter, and if you are sufficiently interested, will let you know the results later on. Incidentally, the 3A4 appears to be quite good for transmitter work as it is rated for 135 volts maximum, and should give a hefty signal without overloading. The circuit is given in Fig. 2.*

*The aerial is coupled by putting one turn of wire in the middle of the coil though insulated from it. One end goes to the aerial and the other to earth. Mention is made of the frequency being affected by the anode voltage, but in ordinary use the variation is very little, and it would not be necessary to check it every time the transmitter was set up.*

In the September 1950 issue, the writer remarked that someone at last seemed to be getting results with tuned relays. At the time those notes were written, no one in Britain had made any claim publicly to have achieved success. As a result of this, the writer has received a letter from Mr. E. L. Rockwood of California, with a leaflet giving a few particulars of a complete equipment he has designed and put on the market. These equipments are available in one, two, three and five channel form, and reliable operation is obtained with a transmitter input of only half a watt. This is undoubtedly a most worthwhile achievement. With the three channel outfit, the transmitter control has a self-centering key switch and a push-button. The usual scheme is to control the rudder with the key switch so that pressing the key to the left the rudder is turned left, and pressing to the right gives right rudder. The push-button controls the engine speed for idling or full power, or to stop the engine when required. Range is as far as can be seen and probably farther, and the receiver uses only three valves. A complete equipment on the market commercially is very different from the experiment sets the writer had heard about previously.

Since writing those September Notes, the writer has heard

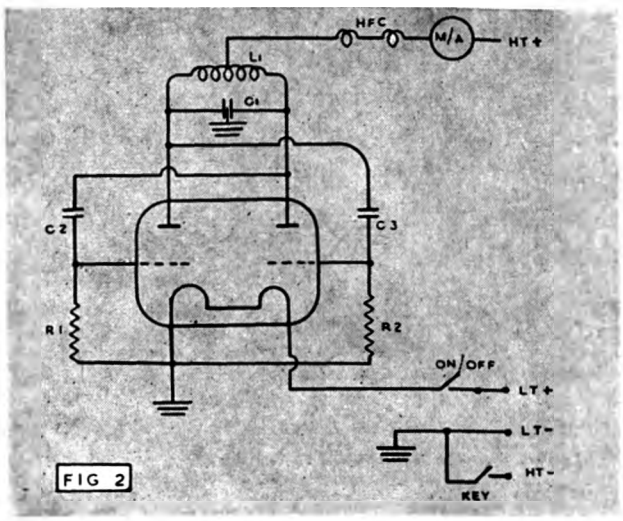


FIG 2

that Mr. Honnest-Redlich won three cups and two plaques at the Fleetwood model boat competitions on August Bank Holiday, 1950, using a three channel tuned reed equipment. He has also built a three channel control model aeroplane, and has promised to let the writer describe it sometime.

Some interesting correspondence has been received from Mr. Sinfield of Luton. The second letter asks for some of the first to be cancelled, but the first has been printed in full due to its interest value. Here, then, is the first letter :—

*I am extremely interested, from a radio viewpoint, in the radio control of models. Certain technical disadvantages are apparent which, presumably due to the slight additional cost, do not appear in commercial equipment.*

*While for simplicity the receiver using one XFG1 type valve is simplest, is suffers from :—*

*(a) Radiation due to aerial being directly coupled to an oscillating circuit.*

*(b) Difficulty in tuning, due to varying proximity of aerial to ground and nearby objects : variation in detector grid circuit loading for same reason.*

*Both these points (a) and (b) can be overcome by fitting an R.F. amplifier stage between aerial and detector (as well as the advantage of increased overall sensitivity). The 1T4 type is most suitable for this purpose—see Fig. 3.*

*The transmitter also suffers from defects which, probably for*

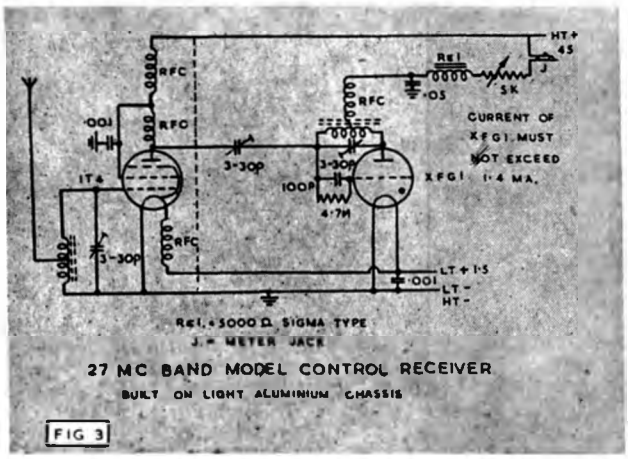


FIG 3

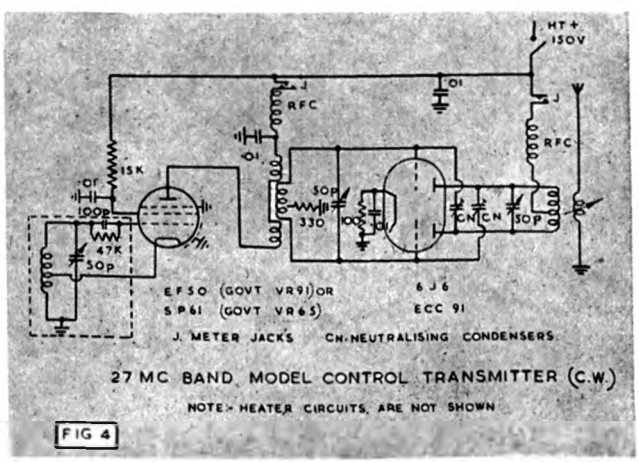


FIG 4

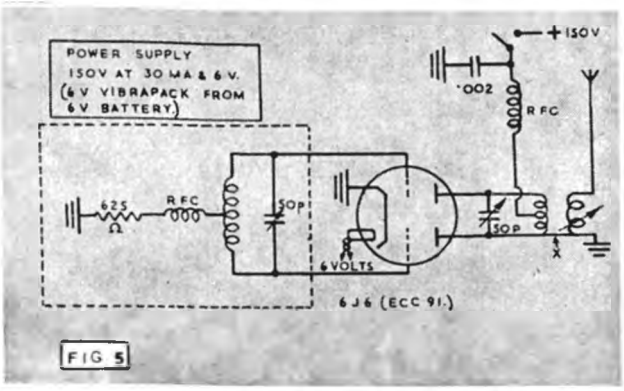


FIG. 5

*same reasons are not overcome generally :—*

*(a) It appears to be normal practice to use a one-valve transmitter. The efficiency of such a valve is extremely low as well as being unstable as regards frequency.*

*The point surely to aim at is to have the frequency absolutely solid and steady and to put as much into the aerial as possible, with the allowed 5 watts maximum input.*

*For this particular frequency and power, probably easily the most efficient valve is the 6J6 (or ECC91) which is rated for* 3·5 watts R.F. output *for an input of 4·5 watts (150 volts at 30 m/a.).*

*For stability the 6J6 should work as a neutralised push-pull power amplifier and be driven by a separate oscillator valve. The required drive is extremely small. Suitable circuit is shown at Fig. 2.*

*I have started to build the complete radio and Figs. 3 and 4 are the arrangements I shall be using. (Possibly a mark-space modulator may be added later.) I am convinced that such circuits are essential to ensure adequate reliability. Simplification can be carried too far.*

A big point here is that Mr. Sinfield states his ideas and intends to try them out. Now this is the path that leads to progress. It will be very interesting to see how the XFG1 with R.F. amplifier behaves. With such a scheme it might be possible to get two sets working in the narrow band we are allowed. With regard to the transmitter it was generally reckoned in the best radio circles that a transmitter of this type will give the best results. Its stability and efficiency have been proved. The only way it could be improved would be to have the oscillator crystal controlled. However, here is Mr. Sinfield's second letter :—

*Re my letter on model control transmitter and receiver.*



*Please cancel all remarks re the transmitter as I have been doing some experiments and evolved a simpler arrangement which suitably fulfills the requirements.*

*The valve is the same 6J6 but is a single valve oscillator transmitter. Using one tuned circuit only, the output was very low and loading affected the frequency. However, using two tuned circuits in a push-pull T.P.T.G. oscillator the output jumped up considerably and loading had little effect on frequency.*

*The improvement can be readily noted by measuring output at 4·5 w.) with dummy load and flash-lamp bulb or thermometer and comparing with several of the available commercial transmitters (also working at 4·5 w. input).*

*The circuit is now as Fig. 5.*

*Both coils are self supporting 1 in. diameter and centre tapped. Tuning condensers are both 50 pf miniature air speed variables. Grid circuits completely screened. Whole transmitter in metal box.*

*The 6J6 can be obtained from Premier Radio at 6/6. ex Govt. The 50 pf c/s cost approx. 3d.–1/–, ex Govt. An ex Govt. vibrapack for 6V can be obtained for less than £1.*

It is very gratifying to get experimental results sent along in this way.

Next is a scheme from Mr. K. R. Taylor of Plymouth, and here is his letter :—

*I should like to submit the following idea.*

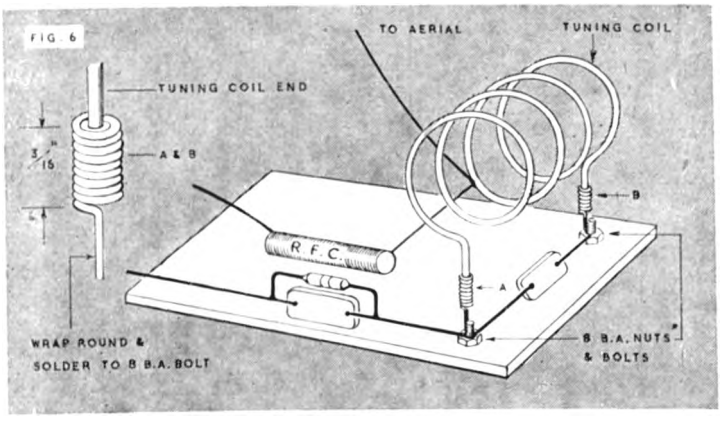
*The purpose is to make the tuning coil on a receiver easily detachable should it get damaged in a crash, without having the other wiring coming adrift when removing the coil. This method of fixing also provides more rigidity to the coil.*

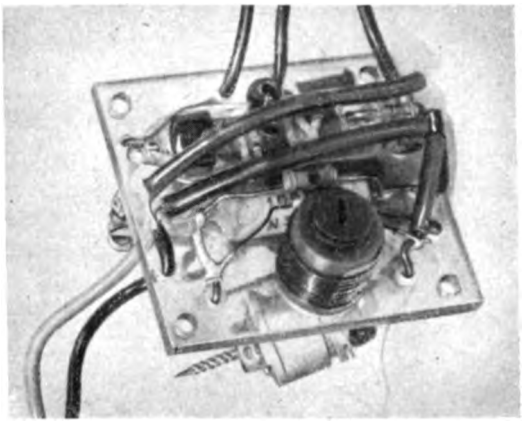
*In the diagram, Fig. 6, A and B are made from 18 G tinned copper wire wound around a small terminal screwdriver in the form of a spring, and then removed from the screwdriver. The straight end is then wrapped around and soldered to the 8 BA bolt at A, a similar " spring " is then made for B. The centre of both " springs " is then filled with solder.*

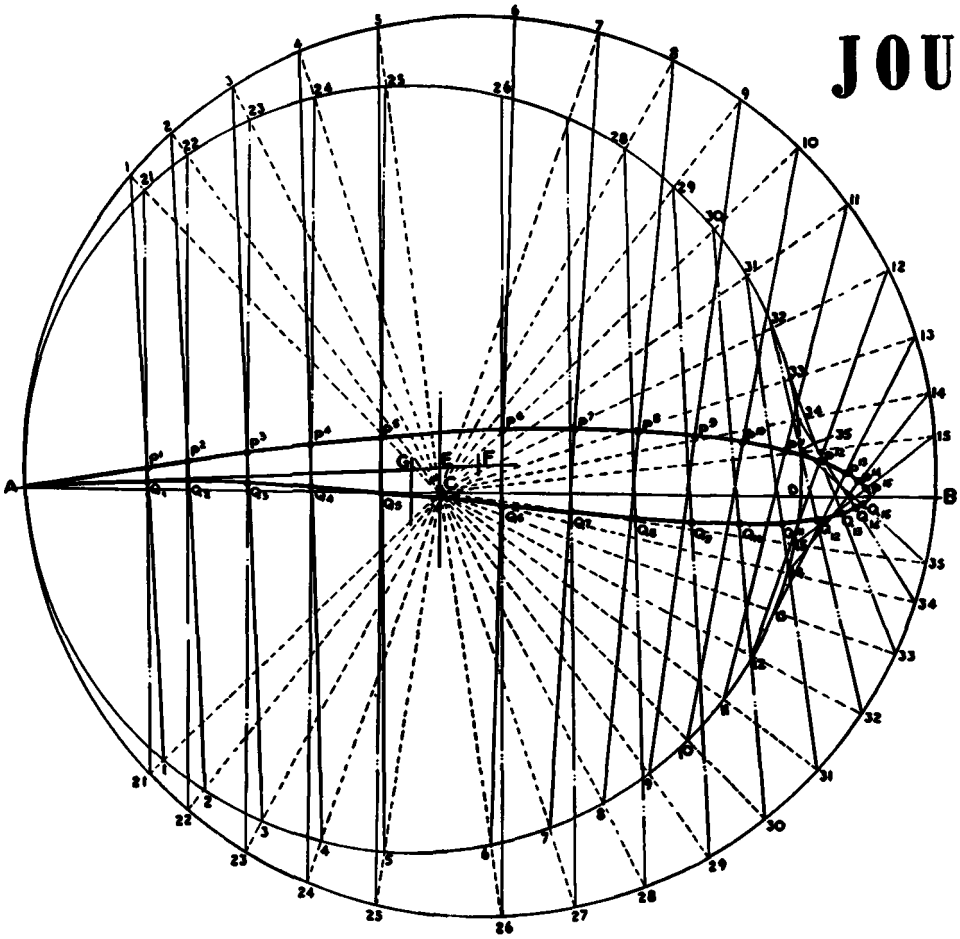
*All that is necessary to insert tuning coil is to melt the solder in the " springs " to push in tuning coil ends.*

*I have used this idea for three months on a Flight Control receiver, and also in the transmitter to give greater rigidity to the tuning coils. It has given every satisfaction.*

Last, and least this time, is the writer's baby receiver shown below, actual size, which weighs one and one-eighth ounces with aerial but not wiring.






# JOUKOWSKI AIRFOIL SYSTEM

## REVEALED BY BÖRGE BÖRGESON

*Favoured by 1950 contest winners, F. Holland, J. B. Knight, D. H. Rumley and R. H. Warring, the Joukowski airfoil is one of the most popular undercambered sections used on rubber models. Few modellers realise that it is possible to design this airfoil with variations in camber, thickness and actual contours. Swedish expert Börge Börgeson reveals the simplicity of this system and tells you how you can design your own airfoils.*

THE vast range of airfoil sections now made available to aeromodellers has perhaps added confusion to the choice of ideal wing/tailplane section relationship. By using the Joukowski system described here, it is possible for modellers with the most limited experience to develop similar airfoils and obtain the best co-ordination between the wing and tail. For example, if one is to design the Joukowski section for a wing, then a slight variation of the camber angle and slight change in the E–F dimension will produce a thinner airfoil of the same family, which will be perfect for the tailplane.

### The Design System

1. Having decided what chord is desired, measure the distance X between points A and C along a horizontal line, distance X will be equal to 49·5% of the desired chord. Construct a perpendicular line from the point C.

2. The camber angle (between A–E and A–C) is decided in the light of experience. Readers will note that the airfoil shown in the diagram has been designed around a camber angle of 4°, and has produced the type of airfoil generally accepted for Wakefield use.

3. Decide the desired thickness ratio and calculate the measurement of half the maximum thickness. Measure this distance along the camber line between E and F. F is now used as a centre for the circle between A and B, which is scribed with the radius dimension A–F.

4. To calculate the centre point of the inner circle

$$\frac{X^2}{\text{distance C–B}} = \text{distance C–D}$$

Mark point D and bisect line A–D. Erect a perpendicular to intersect A–E at the point G. This point G is now used as the centre of the inner circle which has as its radius A–G.

5. The drawing of the section can now be completed, using the two circles. Draw two lines from the point C each of which forms the same angle with the line C–B or A–C. Draw a line between the intersection points, on the outer circle and inner circle, and bisect this line to obtain the plotting point for the airfoil curve, *e.g.*, follow C32 (inner) 12 (outer) and C12 (inner) 32 (outer). Note that the two points 32 are joined, and likewise points 12. Each of these latter lines are bisected, giving P12 on the upper surface and Q12 on the lower surface. The angles formed by C12 (outer) and C32 (outer) to the horizontal A–B are equal. Approximately 15 such constructions will provide sufficient plotting points for the section to be drawn.

Symmetrical Joukowski airfoils can be created by eliminating the camber angle and fixing the centre points F and G on the line A–B. These symmetrical sections have a low drag and high critical angle of attack. They should therefore be ideally suited for C/L Stunt.

It might be detected that the rearmost point of the normal Joukowski airfoil is formed by the junction of the upper and lower contours at a theoretical 0°. This results in a very sharp trailing edge, and consequent structural difficulties. However, slight thickening at the trailing edge has been adopted as a standard practice by most rubber exponents.

Why not have a try at designing your own airfoil ? Armed with a pair of compasses, a protractor and tee square you can plot a perfect airfoil to any chord within a half hour.

# ESPECIALLY FOR THE BEGINNER

## PART XIV

BY THE REV. F. CALLON

I IMAGINE that since Christmas there are many more diesel engines in circulation than there were before. And quite a few of them will doubtless have been installed in Tomboys. I will be very interested to hear how the Tomboy is behaving, so if you have any building or trimming difficulties or any exceptionally good flights, why not drop me a line? The information may easily be useful to other Tomboy owners.

The prototype still looks as good as new in spite of constant use. The other Sunday I risked a flight with the plastic propeller on the right way round, and the result was a perfect loop followed by a rocketing climb—and a long recovery run! For normal "sport" flying, the ideal combination seems to be very calm weather, a longish engine run and the propeller reversed. I almost got a stiff neck recently when flying under these conditions, for Tomboy was turning in flights of 4 and 4½ minutes as regularly as clockwork, keeping right overhead the whole time, and generally landing within some 30 yards of the take-off position. Any deck chairs for sale?

### "Genre" Photographs

There is something very attractive about *genre* photographs —that is, photographs of people "on the job", and their own particular job at that. Typical examples would be pictures of a farmer ploughing, a blacksmith shoeing a horse, a toolmaker at his grindstone, or of an old lady working away at her knitting. Such pictures always tell a story, and even though they may have been specially posed, the model seldom looks self-conscious, being actually occupied in working at something which he or she knows a great deal about, and which calls for every ounce of concentration. Which is all very much to the point as far as aeromodelling goes.

It is obviously going to be an indoor photograph, so that a photoflood bulb (and reflector) will be required, but apart from that the preparations are quite simple. The accompanying illustration is the sort of thing which anyone should be able to turn out without much trouble. It is obviously not a masterpiece, but considering the whole job took only about ten minutes, it provides a pleasant enough record which was well worth the trouble. A work-table or modelling board makes quite an appropriate background to such a picture. In this particular case, one photoflood bulb was used, directed down towards the subject from the right-hand side. The exposure was 1 second at f.8—which should be 2 seconds with a box camera—using a fast panchromatic film.

The chief fault with the present photograph is that the work being done does not show up very clearly. The balsa wood is light coloured, and since it was pinned over the white plan, much of the detail is lost. A better result could have been obtained by waiting until the building had progressed further, when the framework could have been removed from the plan and held over the darker coloured wood of the actual worktable. If you try this method for yourself, remember that balsa wood is very light, and that the slightest touch will mean movement—and consequently a blurred picture. The best way out of the difficulty is to leave the framework resting on the table, and to arrange the subject (*i.e.* the person being photographed) to look as if he is actually working on it, while in fact he is not touching it at all. And don't expect him to keep his hands still if they are poised in mid-air; wrists should be resting firmly on the edge of the table while the exposure is being made.

### Running Repairs

Small models are constantly in need of patching. A crash landing in a thorn hedge, or even a normal landing in a field of stubble, very often brings its crop of small tears and punctures in the covering fabric. Although not immediately dangerous in themselves, they can easily develop into unsightly rips which will eventually cause weakness in the structure of the model. So try to get into the habit of having a patching session when necessary as soon as the day's flying is over.

**A. Pinholes:—** Small punctures are very easy to mend. First, cut out a very small circle from the correct colour of tissue—its diameter need not be more than ¼ in. Dip your brush into clear dope (wiping off the surplus on the lip of the tin), and paint a half-inch circle round the puncture in the model. Pick the patch up on the bristles of the doped brush, and lower it into place. Then, with another dip in the dope tin, give a final thin coat of dope over the top of the patch.

If the tissue has been originally treated with clear dope only, the patch will dry out practically invisible, but over banana oil or coloured dope a slight roughening of the surface will be noticed unless you work very fast. In this case, if you want a perfect finish, wait till the dope is quite dry, and then go over the roughened surface with a thin coat of banana oil or the correct shade of coloured dope.

**B. Tears:—** For really large rips in the tissue, trim away all the covering from the affected panel, right up to the surrounding balsa framework. Cut a piece of tissue accurately to give an overlap of ⅛ in. to 3/16 in. all the way round. Put a thin line of tissue cement—or ordinary cement will do—around the edges of the panel, and wipe it off again at once. This pre-cementing is particularly necessary when you are working over banana oil, which tends to "roll up" when the cement first touches it. Now add a second line of cement round the panel, and lower the patch into place, smoothing the cemented edges lightly outwards with the finger tips. Leave for at least 15 minutes before doping the patch. Water-shrinking will not be necessary.

## Mending Broken Wings

After the propeller on rubber models, the most vulnerable part of a small plane seems to be the wing. Being of fairly light construction compared with the fuselage, it is in greater danger of giving under the strain of carelessly trimmed flights and bad landings. Mending a smashed wing is not normally a job to be undertaken out on the field, but care in picking up the model, so as not to add to the damage, can save a great deal of time when the job is eventually tackled. Whatever you do, resist the temptation to tear the damaged portions apart or break off any protruding pieces of spar; a clean break is much easier to mend than one which has been " chewed up ".

## Broken Dihedrals

Occasionally a wing will fold up at the dihedral, owing to a poor joint having been made there. This is quite a simple job to put right. Trim away the tissue, top and bottom, from the panels on either side of the joint. Remove gussets and dihedral braces (if any). Cut new braces to the correct angle from 1 mm. ply to fit against both the L.E. and the T.E.—the rib which occurs at the dihedral will have to be removed when these are inserted. Pin down one part of the wing over grease-proof paper, and cement the other part against it, propped up to the correct dihedral angle. Cement the braces firmly in place, and then add the dihedral rib. Finish off with four good, strong gussets, two on each side of this rib against L.E. and T.E. Then re-cover the panels (as described in " B " above), underside first, then top-side with overlap. Cement, not paste, should be used here.

## Wing Broken Elsewhere

Things are slightly more complicated when the break occurs across one of the flat planes of the wing, for this means that L.E., T.E., and any spars there may be, have all been smashed.

Trim away all the tissue, top and bottom, up to the nearest rib on either side of the break. Place the plans of the wing on the workboard, cover with grease-proof paper, and pin down *one* part of the wing in position over it. Now, without cementing any joints, slide the other part of the wing up against the first to see how the broken joints knit together. If the break is a clean one, and no wood has actually broken away, all that has to be done is to cement the joints, slide them tightly together, and pin down the second side while the cement sets. Then reinforce the joints with " braces " of hard 1/16 in. sheet balsa cemented against the inside of the L.E. and T.E., and also against the spars (if any), the braces extending for at least half an inch on either side of the break.

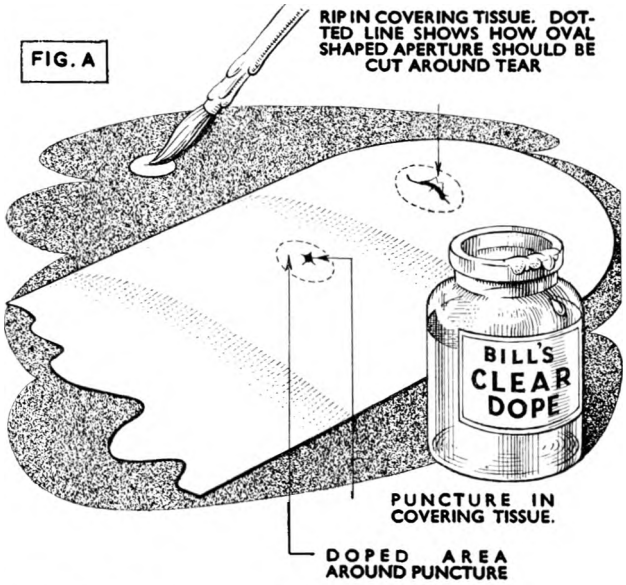
If any pieces of spar are missing, pin the second part of the wing down over the place marked for it on the plan, and cut away the broken spar ends to make scarfe joints—*i.e.* with slanting cuts. Then cut the necessary lengths of the correct type of spar to fit snugly into the gap. Be sure that these insertion lengths really are a good fit before you cement them into place. Use straight pins to ensure that the joints hold tightly together while drying, and add straight 1/16 in. balsa " braces " as before, or gussets if the break occurs very near to one of the ribs. Leave to dry for about an hour—or preferably overnight—before commencing to sand the joints prior to re-covering the panel with tissue.

*Endeavouring to attain the distinction of being our youngest readers, Messrs. Clarke, Gay and Brown of the Ruislip Club, whilst hardly bouncing babes themselves have some bonny models that doubtless are bounced on many an occasion.*

SMALL CIRCULAR PATCH "PICKED-UP" ON DOPE BRUSH AND LOWERED OVER PUNCTURE

FIG. A

RIP IN COVERING TISSUE. DOTTED LINE SHOWS HOW OVAL SHAPED APERTURE SHOULD BE CUT AROUND TEAR




PUNCTURE IN COVERING TISSUE.

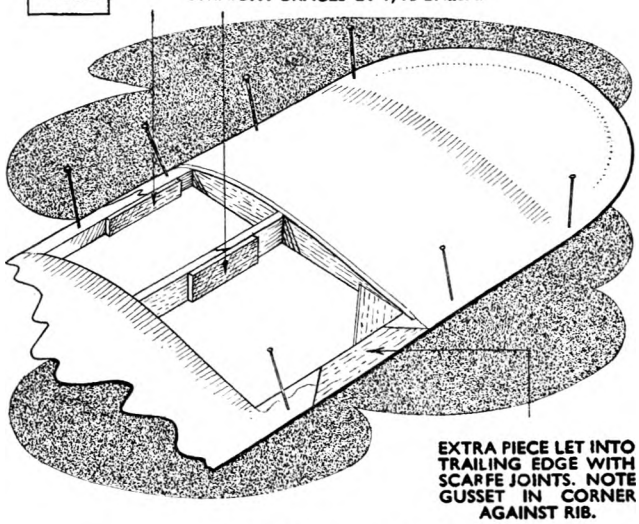
DOPED AREA AROUND PUNCTURE

**COVERING REPAIRS**

The whole job is pinned down over grease-proof paper

FIG. C

BREAKS IN L.E. AND SPAR REPAIRED BY STRAIGHT BRACES OF 1/16 BALSA.



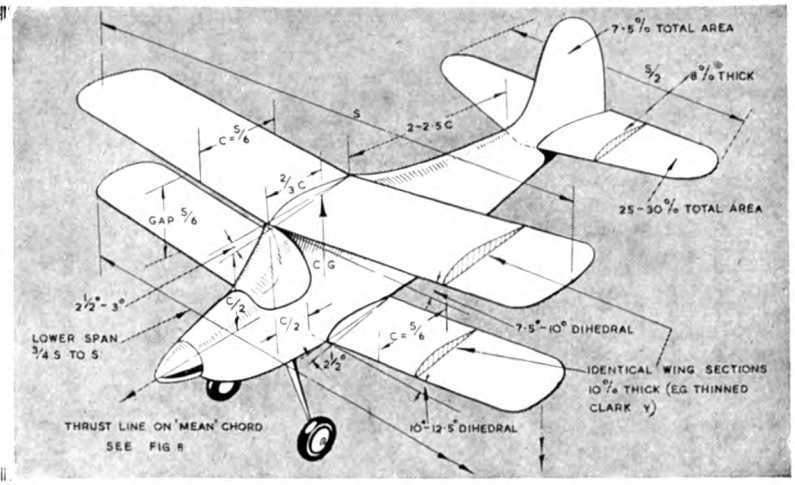
EXTRA PIECE LET INTO TRAILING EDGE WITH SCARFE JOINTS. NOTE GUSSET IN CORNER AGAINST RIB.

**MENDING A BROKEN WING**

# It's DESIGNED for YOU

## NUMBER NINE

## BIPLANES




BIPLANES appear always to have had a more limited appeal to aeromodellers. Before the war there was an annual S.M.A.E. competition for rubber model biplanes and a number of contest models of this type were produced. Some of the best performances, however, were put up by orthodox monoplane duration models "converted" by the addition of another wing, often with no further modification than this. In other words, tail and fin area was unchanged, the additional wing slung beneath the fuselage appearing to have but little effect on stability. In the post-war years the biplane rubber model is a rarity.

For various reasons the performance of a biplane does not compare with that of an orthodox monoplane as regards duration work. Basically the biplane layout is adopted to obtain more wing area at reduced structural cost. In full size practice it was, until recently, easier to obtain wing area at light overall weight with a biplane wing than a cantilever monoplane wing. The same does not hold true for models. If anything, the weight comparison would be in favour of the monoplane and so on this score there is little or no justification for the biplane layout.

In the power duration field only a very few successful biplanes have appeared. None have been as good as their monoplane contemporaries, losing especially in climb. In other words, the biplane arrangement, area for area of equivalent lifting surface, has greater drag. This is partly due to the fact that biplane wings interfere with one another, reducing the efficiency of each. The *total* area of biplane wings, for example, needs to be more than that of a monoplane wing of the same lifting power.

Certain layouts can be used to minimise biplane interference and thus increase the efficiency of the individual wings. A large gap or spacing between the wings, for example, minimises interference and this is usually adopted, but we shall consider some of these points in more detail later on.

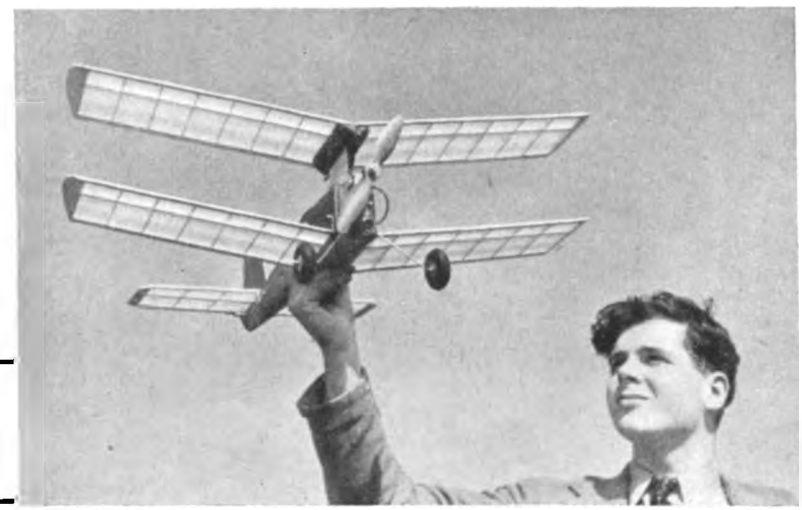
If not suitable for duration flying, therefore, why do people build biplane models at all? One of the chief reasons is that the biplane is attractive, both in appearance and in flight. It is possible, too, to approach closely to a semi-scale layout on a biplane. Slightly less dihedral is needed, for example, which coupled with the shorter span, gives a certain "full size" illusion. As a sports model the biplane becomes an attractive proposition and something "out of the rut."

Unfortunately there is very little data available on biplane design and very few commercial kits or plans. The average designer has very little to go on and, perhaps fearful of some hidden pitfall—after all, he has not seen many biplanes around—he eventually produces a monoplane once more. Yet the biplane sports model is certainly no more difficult to design than the monoplane sports model. Of the two, the biplane with its higher drag values is likely to be the safer!

### Gap & Stagger

First there are a number of definitions applicable to the biplane which it is as well to understand. Most of these relate to the rigging of the two wings. The gap, as we have previously mentioned, is the distance between the two wings. This is actually measured as the vertical distance between the chord lines of the two aerofoils—Fig. 1. All biplanes must, obviously, have a certain gap and, in general, this should be as large as possible. For satisfactory efficiency a minimum figure is usually quoted of gap=wing chord (or chord of the largest wing if these are of unequal size). There is no theoretical upper limit. Above a gap of about one and a half times the chord each wing acts as a single monoplane wing with no inter-wing interference.

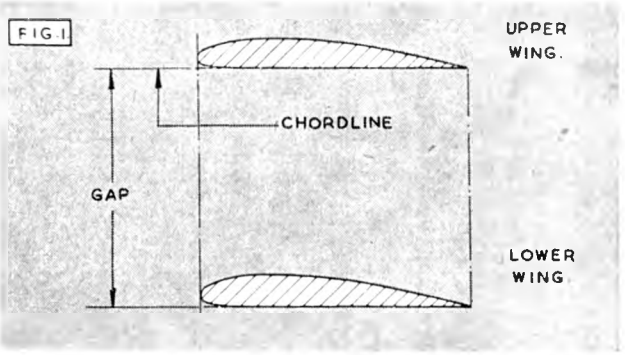
This brings up a point that it should be possible, with a large enough gap, to produce a biplane where the total area is



***Ever popular APS design "Sporty" is a perfect example of the unbraced equal span Biplane. Over 1,000 of this design were built during 1950, and at least one scaled-up version is flying with radio-control. Here C. Donaldson displays his Frog powered version.***

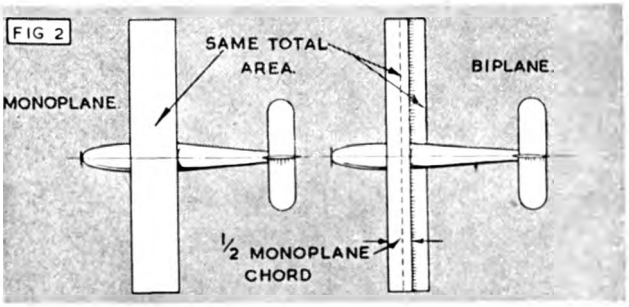
*A first choice for Biplane scale is the famous De H. Tiger Moth. M. T. Mitchell's model was built to APS plans for C. Rupert Moore's ¼th scale rubber driven version. Span is 44" and weight 14 ounces.*

equally as effective as that of a monoplane wing of the same area. Unfortunately, however, this ignores "scale effect" or the fact that, as far as models are concerned, larger wings (and larger wing chords especially) are more efficient than smaller wings. The monoplane and biplane compared in Fig. 2, for example, have the same span and total wing area. Assuming that the biplane gap is such that the two wings are each operating as monoplane wings, in effect, but the chord of each wing is only one half the chord of the monoplane wing. Each biplane wing, therefore, is less than one half as efficient as the monoplane wing owing to the reduced chord. Preserving the same chord, for similar aerodynamic efficiencies, the biplane span is reduced to a ridiculous figure with each biplane wing having an aspect ratio of only 3 : 1—Fig. 3. This low aspect ratio will result in increased induced drag and the reduced span will also probably be insufficient for stability, especially in controlling torque. A large gap, therefore, in spite of being desirable, is still no complete cure for biplane inefficiency problems.

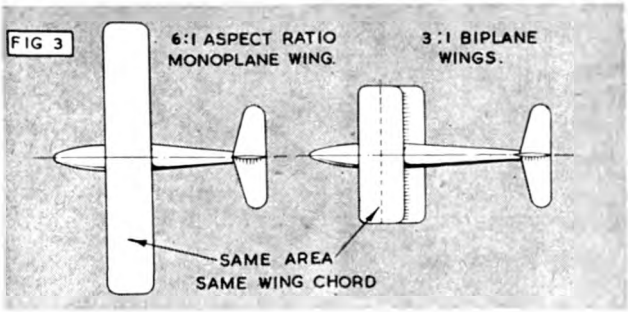



Somewhat the same effect as gap can be produced by locating one wing of a biplane backwards or forwards relative to the other. This is known as stagger—backwards or forwards, depending on the relative position of the upper wing—Fig. 4. Theoretically, forward stagger is best and the use of stagger enables the gap to be reduced for the same overall efficiency. If both wings are rigged to lift to comparable degrees, the upper wing with forward stagger actually has less drag than the lower one. In other words, the centre of drag of the biplane arrangement is lowered, which can also have a stabilising effect, under power.

However, some designers prefer to use stagger for another stabilising purpose by introducing *decalage*. Decalage is a difference in rigging incidences between the two wings—Fig. 5. If the top wing is set at a greater angle of incidence the combination is said to have positive decalage; if the lower wing has the greater incidence, negative decalage. Positive decalage is more usual with forward stagger.



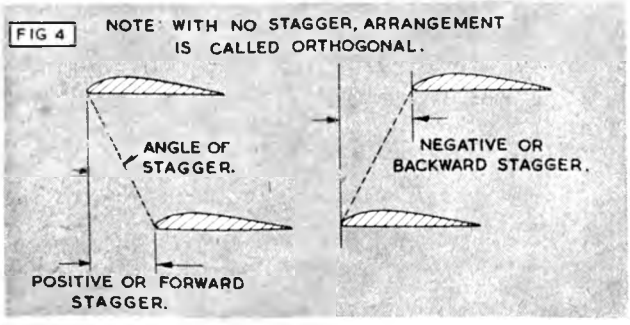

With positive decalage the upper wing will reach its stalling angle before the lower one. Used with positive or forward stagger, therefore, the lower wing will act like a short-coupled tailplane to improve longitudinal stability. When the upper wing has stalled, the lower wing, farther aft, will still be lifting strongly helping to correct the stall. The effect, however, is small compared with tailplane power for similar correction, and positive decalage does not seem a worthwhile inclusion solely on this score.

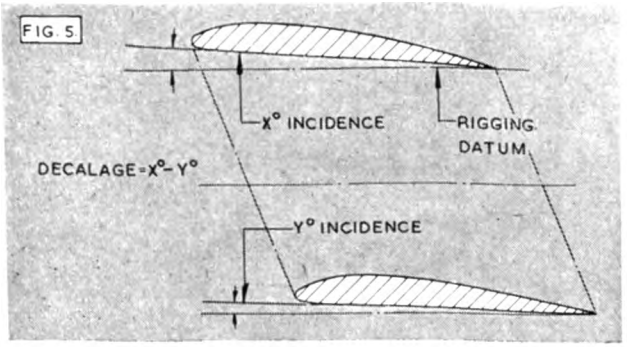



## Design for Efficiency

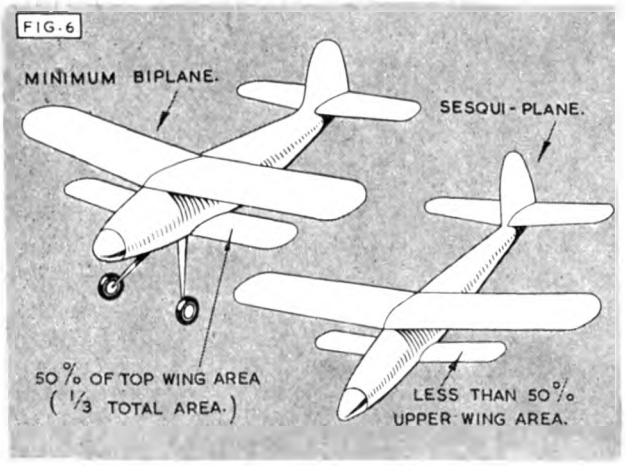
Reviewing the biplane arrangement, as far as we have gone, we have established that we want a large gap, whilst stagger can also be used to produce a similar slight increase in efficiency. At the same time our biplane arrangement is still inferior as compared with a monoplane wing.

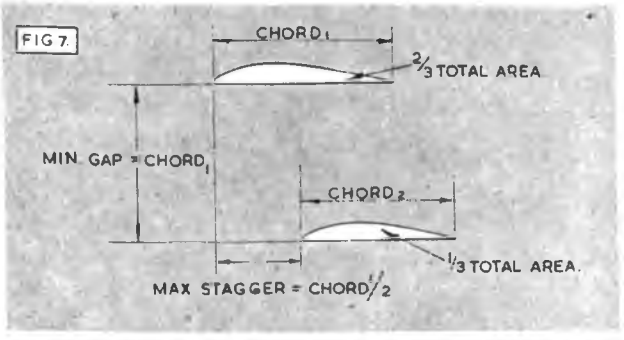
It is important, therefore, to make sure that both wings of the biplane operate as efficiently as possible. In a sports design we are not concerned so much with low drag values but require a reasonable amount of lift for slow flight. It would therefore seem logical to arrange the wings at a similar incidence and so space them that they are operating virtually as separate monoplane wings. Some of the rubber models entered in the biplane contests, for example, used an added lower wing rigged so that it was operating at a very low angle of attack in flight. The object was to reduce the drag of this second wing as far as possible and not bothering about getting much useful lift from it. The upper wing was relied upon to provide nearly all the lift required. Similarly, rigging one wing of the biplane to act partly as a stabiliser—which it can

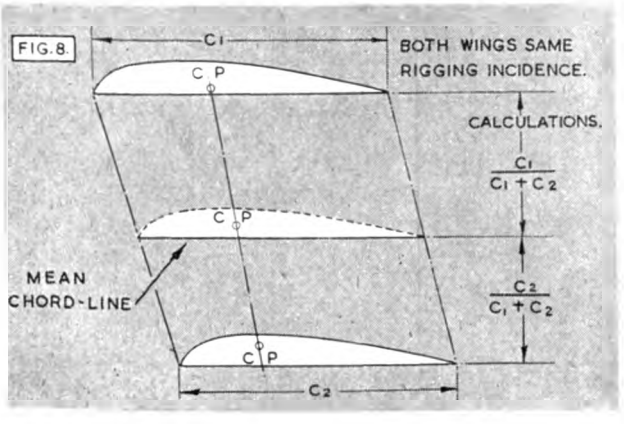





*Scale enthusiast John Greenland made this Sopwith Camel with Amco ·87 power. Markings are those of 70 Squadron R.F.C. Generous gap allows this aircraft to be scaled for power flight; but lack of dihedral and the short nose are distinct disadvantages.*



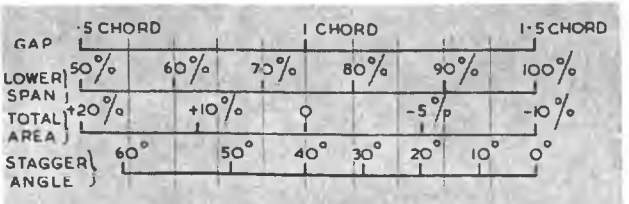




only do by reducing the efficiency of the biplane arrangement as a source of lift—does not seem worthwhile when we can produce the same, or better, effect with a tailplane of suitable proportions.

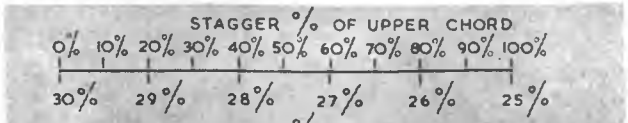
The size and proportions of the two wings are the next factors to consider. As far as overall efficiency goes it seems that the larger one wing of the combination is, in proportion to the other, the better, until monoplane efficiency is achieved when the larger wing is 100 per cent. There is a limit, however, to what constitutes a biplane and when it becomes a monoplane with an additional stub wing or winglet.

The usual limit is where the lower wing is not less than one half the area of the upper wing—Fig. 6. If the lower wing is smaller than this then the layout is called a sesqui-plane. Some Nieuport biplanes of World War I were sesqui-planes, for example. The question is now whether to proportion the two wings in the ratio 2 : 1 for " minimum " biplane layout.

If for any reason the gap has to be kept small—say, under the chord length of an equal-area biplane—then there are good reasons for adopting this layout—Fig. 7. If, however, there is no particular restriction on the gap, then for general ease of working, identical wings may be employed. These two should be of the same section, in fact there is very little justification for using different sections on upper and lower




DEPARTURE DIAGRAM, FOR PROPORTIONATE VARIATIONS OF DESIGN READ VERTICALLY THROUGH THE FOUR SCALES. E.G. CHANGE TO 1·5 CHORD GAP, REQUIRES EQUAL UPPER & LOWER SPANS, 10% LESS TOTAL AREA & NO STAGGER.




SCALE SHOWING PROPORTIONATE VARIATION OF STAGGER OF TAILPLANE AREA.

wings, unless for longitudinal stability reasons, and as we have previously noted, such a move is unnecessary.

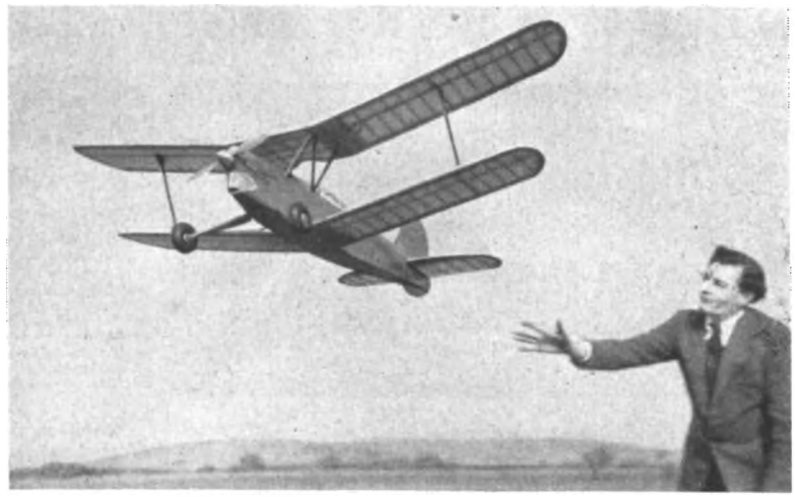
Six-to-one is about the optimum aspect ratio for constant chord power model wings. The danger in increasing it to 8 : 1 is the possibility of a weaker wing structure, or greater weight of wing for the same area, and the possibility of reduced efficiency from the smaller chord resulting.

The rest of the model we can then base around the biplane wing arrangement, as shown in the heading diagram. All the other proportions can be related to wing area or wing span. The nose length is the only unknown factor, for this will be dependent on motor weight. A heavy motor will need a shorter length of nose to balance out at the required C.G., a light motor, a long nose. Theoretically this should have an effect on the fin area required, but this does not appear to be critical in practice.

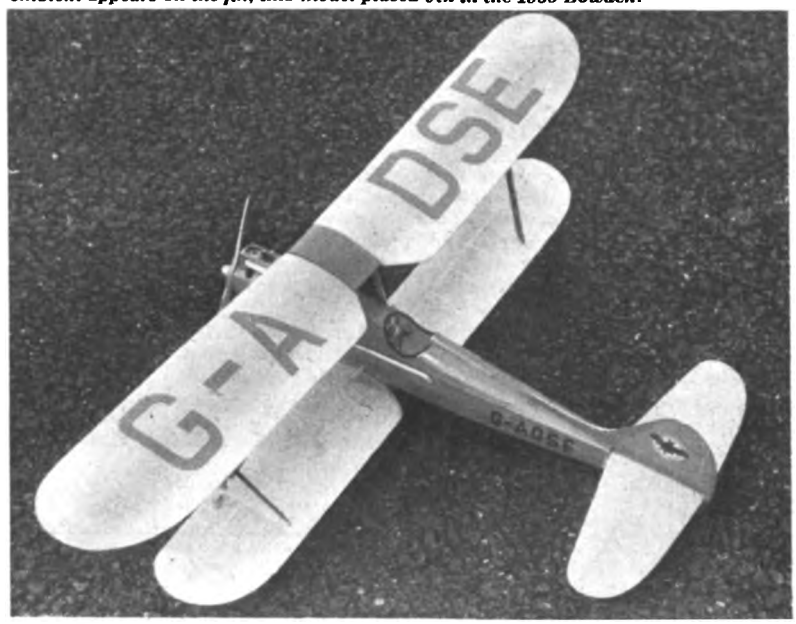
The layout shown in the heading drawing utilises a stagger of one-half of the wing chord, which is about the maximum which should be used. Less, of course, can be employed when the centre of gravity position indicated will move forwards accordingly. Less stagger, however, may well reduce efficiency with a gap of one chord length. This gap already is quite high and demands a very deep fuselage or the upper (or lower) wing mounting away from the fuselage, either on a pylon or struts. It is advisable to raise the upper wing rather than lower the lower wing, for the same reasons that high or parasol wing monoplanes are more desirable, from the stability point of view, than low wing designs.

It is possible, theoretically, to calculate the equivalent monoplane wing of any biplane arrangement and this method can be adopted, if desired, for rigging and balance, as well as overall proportioning. A simple geometric construction for determining the "equivalent" monoplane wing is then shown in Fig. 8.

The biplane arrangement does not readily lend itself to simple calculations and the various possible effects of altering the design factors can only be dealt with in a general way. We have tried to do this in the form of what we shall term "DEPARTURE DIAGRAMS," showing what action is recommended, or would appear desirable, in the event of departing from the original basic layout of the heading drawing.



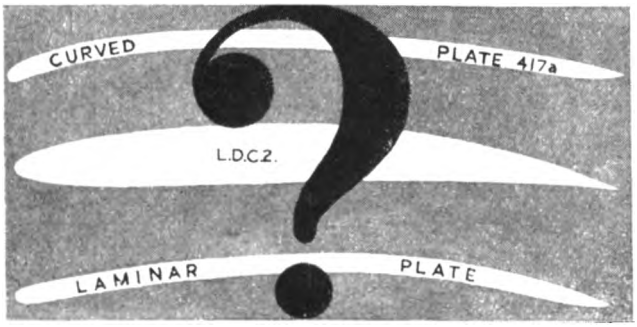
*ABOVE. No article on Biplanes could ever be complete without reference to that London area specialist, B. "Taxi" Brookes. For as long as we have known him, "Taxi" has been a biplane-only modeller, and his aim has been to win the Bowden with a Bipe. 1950 saw him second in that contest with this model—a design which he varies and improves with a fresh model each year. Using a French Ouragon 2·8 c.c. diesel, which must by now have flown for thousands of hours, each model has had a completely furnished cockpit and a perfectly consistent flight pattern.*
*BELOW. This beautifully made Model Shop Wasp is powered by Mills ·75. Span is 42", and colouring red and white. Made by D. S. Emm of the Battersea club, whose emblem appears on the fin, this model placed 9th in the 1950 Bowden.*




**GENERAL LAYOUT DATA**

| Motor | Equivalent Monoplane Area (sq. ins.) | Total Biplane Area (sq. ins.) | UPPER WING Span (ins.) | UPPER WING Chord (ins.) | LOWER WING Span (ins.) | LOWER WING Chord (ins.) | Stagger (ins.) | C.G. from L.E. Upper Wing | Moment Arm | TAILPLANE Span | TAILPLANE Area | Fin Area |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 12 str. ½ in. Rubber | 160 | 260 | 30 | 4½ | 28 | 4½ | 2 | 3 | 10 | 15 | 80 | 20 |
| 16 str. ½ in. Rubber | 220 | 300 | 32 | 5 | 28 | 5 | 2½ | 3½ | 12 | 16 | 100 | 30 |
| ·5 c.c. ... ... | 200 | 300 | 32 | 5 | 28 | 5 | 2 | 3½ | 11 | 16 | 90 | 25 |
| 1–1·5 c.c. ... | 300 | 456 | 40 | 6 | 36 | 6 | 3 | 4 | 14 | 18 | 120 | 32 |
| 2·5 c.c. ... ... | 400 | 600 | 44 | 7 | 42 | 7 | 3½ | 4 | 16 | 21 | 135 | 42 |
| 3·5–5 c.c. ... | 600 | 784 | 50 | 8 | 48 | 8 | 4 | 6 | 18 | 24 | 200 | 50 |
| 10 c.c. ... ... | 1,000 | 1,240 | 64 | 10 | 60 | 10 | 4 | 6 | 24 | 30 | 300 | 80 |

# GLIDE TESTS ON THREE AIRFOILS




By
FRANK
BETHWAITE

*New Zealand Wakefield enthusiast who personally represented his country as a team member in 1949 at Cranfield, and whose 1950 model was flown proxy in Finland. At right, he is seen checking in with H. J. Nicholls, recorder at the Cranfield event*

THERE seems to be no positive way of determining the best wing section for a Wakefield other than a series of tests. Graphs of most orthodox sections are open to question at low speeds, and claims made by the rival turbulent and laminar schools tend to go to extremes.

Recently I built, most carefully and accurately, three low-aspect-ratio wings of 200 sq. ins. each, all similar in plan form and dihedral. One was the curved plate 417a, 3% thick. One was the LDC2, 10% thick, and the third was a laminar section, developed to be 3% thick. With these three I hoped to find which was of laminar or non-laminar, and also which was the better of thick or thin.

These wings were all mounted, parasol fashion, on an old Wakefield fuselage, and the whole thing weighted to exactly 8 ozs. The tests were carried out one dead calm evening in a local sports ground, where the area is entirely enclosed by trees and hills, and where there is a convenient bank, about 30 feet high, from which to launch towards the level playing-field below. Each wing was tested at three separate C.G. positions, and at progressive incidence settings from dive to stall. Thus there was no question about where precisely was the "best" setting for any given wing. These "best" settings were then re-checked. Every endeavour was made to ensure consistency and accuracy, and the absence of scatter in the points obtained confirmed these endeavours

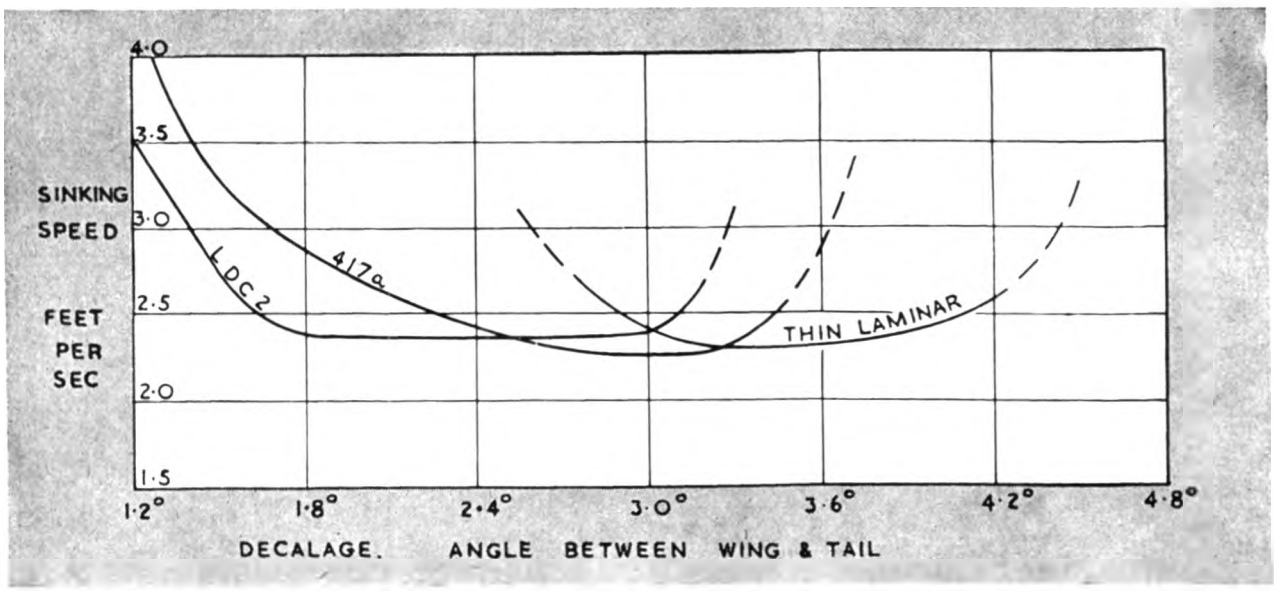
The three curves reproduced are those which contain the points of lowest sinking speed. It is purely coincidental that they all happen to be at 54% C.G. position.

It will immediately be noted that there is precious little difference in sinking speed between the three airfoils. What is perhaps even more interesting, however, is this. The point of landing was always marked, it was found that, in their "best" glides, all three airfoils went just as far, and in just the same time. There was thus no difference in the optimum speeds of the three wings, nor in their best angles of glide. Nor was there any difference between the minimum sinking speed and the best angle of glide.

As a matter of interest, the flying speed of the best glides was exactly 20 ft. per sec. Maximum coefficient of lift was ·725 in all three cases, and the gliding angle, 8·7 to 1.

There is thus no clear-cut conclusion to be drawn. To state simply that the airfoil doesn't matter is obviously wrong—everyday observation proves that. It does seem, however, that at this size and speed there is not much difference in the lift and drag of quite extreme types. And, to draw on long experience, it does seem that there is considerable difference in the "controllability" of different wings. For instance, the 417a I have found quite prone to stall, and generally tricky to trim. The LDC2 has on occasion done such curious things that I now class it as unreliable. A section such as NACA 4612 soars sweetly and smoothly in conditions that would cause a 417a to stall most horribly.

Perhaps this, then, is the answer. Find yourself a section that is predictable, positive in flight, and easy to control. Then stick to it. You can do no better.



# MODEL AIRCRAFT RECORDS

as at 31st December, 1950

## BRITISH

### OUTDOOR
(MINIMUM F.A.I. LOADING)

| | | | | |
|---|---|---|---|---|
| ***Rubber Driven*** | | | | |
| Monoplane | Boxall, F. H. | Brighton | 35 : 00 | 15/5/49 |
| Biplane | Young, J. O. | Harrow | 31 : 05·1 | 9/6/40 |
| Wakefield | Boxall, F. H. | Brighton | 35 : 00 | 15/5/49 |
| Canard | Woodhouse, R. | Whitefield | 2 : 13·1 | 29/7/50 |
| Scale | Marcus, N. G. | Croydon | 5 : 21·7 | 18/8/46 |
| Tailless | Boys, H. | Rugby | 1 : 24·5 | 1939 |
| Helicopter | Tangney, J. | U.S.A. | 2 : 43·7 | 2/7/50 |
| Rotorplane | Crow, S. R. | Blackheath | : 39·5 | 23/3/36 |
| Floatplane | Parham, R. T. | Worcester | 8 : 55·4 | 27/7/47 |
| Flying Boat | Rainer, M. | North Kent | 1 : 09 | 28/6/47 |
| ***Sailplane*** | | | | |
| Tow Launch | Best, F. | Leeds | 63 : 46 | 20/7/48 |
| Hand Launch | Field, P. E. | Belfairs | 7 : 05·2 | 7/5/50 |
| Tailless (T.L.) | Wilde, H. F. | Chester | 3 : 17 | 4/9/49 |
| Nordic A/2 (T.L.) | Whittall, L. | Birmingham | 29 : 51·7 | 2/7/50 |
| Nordic A/2 (H.L.) | Pickles, K. | West Yorks. | 3 : 49 | 10/12/50 |
| ***Power Driven*** | | | | |
| A (0–2·5 c.c.) | Springham, H. E. | Saffron Walden | 25 : 01 | 12/6/49 |
| B (2·51–5 c.c.) | Dallaway, W. E. | Birmingham | 20 : 28 | 17/4/49 |
| C (5·01–15 c.c.) | Lund, D. S. | Wakefield | 6 : 46 | 26/3/50 |
| Tailless | Poile, W. | Folkestone | 2 : 09·6 | 23/8/50 |
| Scale | Tinker, W. T. | Ewell | 1 : 36·5 | 1/1/50 |
| Floatplane | Stainer, J. R. | Canterbury | 2 : 59·4 | 14/8/49 |
| Flying Boat | Gregory, N. | Harrow | 2 : 08·5 | 18/10/47 |
| ***Control Line Speed*** | | | | |
| Class I | Scott, R. | St. Helens | 80·00 m.p.h. | 19/7/50 |
| Class II | Free, D. W. | Surbiton | 80·35 ,, | 19/6/49 |
| Class III | Carter, J. G. | Croydon | 89·10 ,, | 25/9/49 |
| Class IV | Guest, F. | C/Member | 116·90 ,, | 22/10/50 |
| Class V | Shaw, C. A. | Zombies | 118·42 ,, | 19/6/49 |
| Class VI | Taylor, N. G. | Wimbledon | 132·60 ,, | 10/4/49 |
| Class VII (Jet) | Stovold, R. V. | Guildford | 133·30 ,, | 25/9/50 |

### (LIGHTWEIGHT)

| | | | | |
|---|---|---|---|---|
| ***Rubber Driven*** | | | | |
| Monoplane | O'Donnell, J. | Whitefield | 7 : 12 | 21/8/50 |
| Biplane | O'Donnell, J. | Whitefield | 2 : 53 | 22/10/50 |
| ***Sailplane*** | | | | |
| Tow Launch | Mace, J. A. | Upton | 28 : 17·2 | 16/4/50 |
| Hand Launch | Joyce, J. G. | Leeds | 3 : 55 | 26/11/50 |
| Tailless (T.L.) | Johnson, H. G. | York | 10 : 44 | 25/6/50 |
| Tailless (H.L.) | Faulkner, R. A. | Whitefield | 1 : 08·5 | 20/7/50 |
| ***Power Driven*** | | | | |
| Class A | Archer, W. | Cheadle | 31 : 05 | 2/7/50 |
| Class C | Ward, R. A. | Croydon | 5 : 33 | 25/6/50 |
| Tailless | Wyatt, P. | Ipswich | 2 : 15 | 15/10/50 |

### INDOOR

| | | | | |
|---|---|---|---|---|
| ***Free Flight*** | | | | |
| Stick (H.L.) | Copland, R. | Northern Hts. | 18 : 52 | 22/1/37 |
| Stick (ROG) | Mackenzie, R. | Blackheath | 8 : 42 | |
| Fuselage (H.L.) | Parham, R. T. | Worcester | 6 : 55 | 19/2/50 |
| Fuselage (ROG) | Parham, R. T. | Worcester | 6 : 42 | 19/2/50 |
| Tailless (H.L.) | Thomas, M. R. | Oldham | 1 : 25·8 | 23/12/49 |
| Tailless (ROG) | Thomas, M. R. | Oldham | 1 : 46·2 | 20/1/50 |
| Helicopter | Ward, S. A. | Ashton | 2 : 00 | 19/2/50 |
| Rotorplane | Mawby, L. | Ealing | : 32·2 | |
| ***Round the Pole*** | | | | |
| Class A | Muxlow, E. C. | Sheffield | 6 : 05 | 10/12/48 |
| Class B | Parham, R. T. | Worcester | 4 : 26 | 20/3/48 |
| Speed | Jolley, A. T. | Warrington | 42·83 m.p.h. | 19/2/50 |

It will be noted that British Records do not include categories for Distance or Height for comparison with International records, but Outdoor, Lightweight and Indoor sections are included.

At this date Great Britian does not figure in the International list of Records, but with the introduction of new regulations bringing Control Line Speed events into line with International requirements, there *is little doubt that the existing F.A.I. speeds will be substantially* increased.

**C. S. RUSHBROOKE**
*Records Officer*

## INTERNATIONAL

### DURATION

| | | | | |
|---|---|---|---|---|
| ***Rubber*** | | | | |
| Orthodox | V. Nassonov | U.S.S.R. | 10/8/49 | 76 : 00 |
| Tailless | M. Kiraly | Hungary | 23/8/50 | 35 : 42 |
| Hydroplane | G. Egervary | Hungary | 23/8/50 | 54 : 04 |
| Tailless Hydro | L. Aszalay | Hungary | 31/7/49 | 1 : 05 |
| Special A/cft. | G. Egervary | Hungary | 13/6/50 | 7 : 43 |
| ***Sailplane*** | | | | |
| Orthodox | F. Banki | Hungary | 14/5/50 | 147 : 55 |
| Tailless | J. Melichar | Hungary | 21/5/50 | 36 : 05 |
| ***Power*** | | | | |
| Orthodox | L. Sikirine | U.S.S.R. | 18/8/50 | 242 : 30* |
| Tailless | B. Parparov | U.S.S.R. | 12/8/50 | 95 : 15 |
| Hydroplane | M. Vassiltchenko | U.S.S.R. | 28/7/50 | 170 : 00 |
| Tailless Hydro | E. Rakov | U.S.S.R. | 28/7/50 | 30 : 00 |
| Special A/cft. | Y. Khoukhra | U.S.S.R. | 18/8/50 | 27 : 35 |

### DISTANCE

| | | | | |
|---|---|---|---|---|
| ***Rubber*** | | | | |
| Orthodox | G. Benedek | Hungary | 20/8/47 | 50·260 km. |
| Tailless | T. Gall | Hungary | 17/4/49 | 0·720 ,, |
| Hydroplane | E. Horvath | Hungary | 10/9/49 | 45·150 ,, |
| Tailless Hydro | E. Abaffy | Hungary | 10/7/49 | 0·435 ,, |
| Special A/cft. | N. Roser | Hungary | 9/4/50 | 0·238 ,, |
| ***Sailplane*** | | | | |
| Orthodox | M. Varache | France | 21/7/46 | 210·620 ,, |
| Tailless | B. Jansco | Hungary | 9/4/50 | 20·850 ,, |
| ***Power*** | | | | |
| Orthodox | S. Malk | U.S.S.R. | 19/9/47 | 210·620*,, |
| Tailless | E. Rakov | U.S.S.R. | 26/7/50 | 22·850 ,, |
| Hydroplane | P. Smirnov | U.S.S.R. | 19/7/50 | 87·106 ,, |
| Tailless Hydro | E. Rakov | U.S.S.R. | 28/7/50 | 8·650 ,, |
| Special A/cft. | Y. Khoukhra | U.S.S.R. | 14/8/50 | 12·201 ,, |

### HEIGHT

| | | | | |
|---|---|---|---|---|
| ***Rubber*** | | | | |
| Orthodox | R. Poich | Hungary | 31/8/48 | 1442. m. |
| Hydroplane | M. Gasko | Hungary | 18/8/49 | 939. m. |
| ***Sailplane*** | | | | |
| Orthodox | G. Benedek | Hungary | 23/5/48 | 2,364 m. |
| ***Power*** | | | | |
| Orthodox | G. Lioubouchkine | U.S.S.R. | 13/8/47 | 4,152 m. |
| Hydroplane | I. Kavsadze | U.S.S.R. | 8/8/40 | 4,110 m.* |

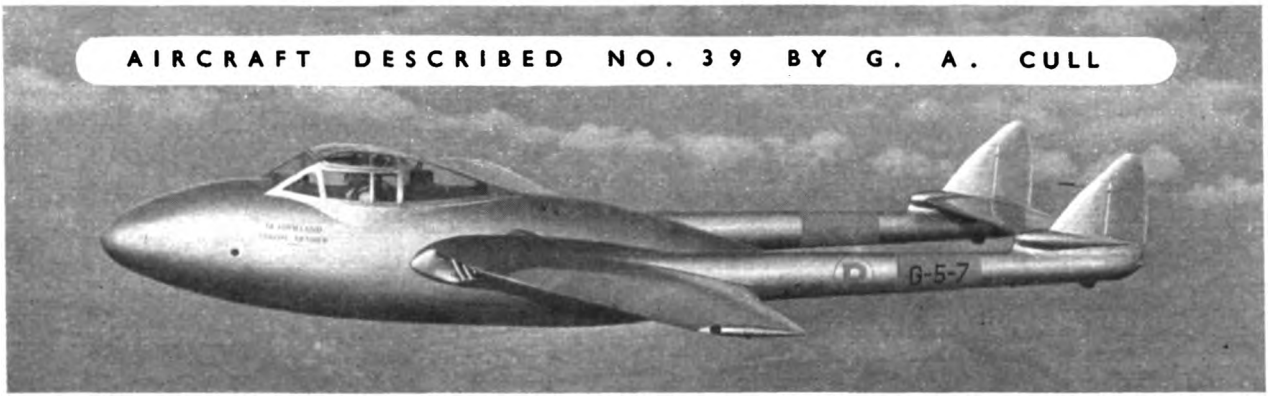
### SPEED
(STRAIGHT LINE)

| | | | | km/hr. |
|---|---|---|---|---|
| ***Rubber*** | | | | |
| Orthodox | V. Davidov | U.S.S.R. | 11/7/40 | 107·080 |
| Tailless | V. Koumanine | U.S.S.R. | 28/7/50 | 33·408 |
| Hydroplane | B. Abramov | U.S.S.R. | 6/8/40 | 76·896 |
| Tailless Hydro | V. Koumanine | U.S.S.R. | 28/7/50 | 31·824 |
| ***Power*** | | | | |
| Orthodox | E. Stiles | America | 20/7/49 | 129·768 |
| Tailless | Martinov/Rakov | U.S.S.R. | 12/8/50 | 49·680 |
| Hydroplane | R. Khabarov | U.S.S.R. | 18/8/48 | 50·050 |

(CONTROL LINE)

| | | | | km./hr |
|---|---|---|---|---|
| ***Orthodox*** | | | | |
| (i) | Z. Husicka | Czecho | 16/7/50 | 105·120 |
| (ii) | R. Labarde | France | 9/7/50 | 192·240 |
| (iii) | A. Millet | France | 10/7/50 | 212·580* |
| (jet) | G. Benedek | Hungary | 4/6/50 | 179·388 |
| ***Tailless*** | | | | |
| (i) | L. Koukhra | U.S.S.R. | 28/4/50 | 66·888 |
| (ii) | V. Simonov | U.S.S.R. | 12/8/50 | 99·288 |
| (iii) | O. Gaevsky | U.S.S.R. | 23/5/50 | 163·447 |
| ***Hydroplane*** | | | | |
| (i) | B. Vassiltchenko | U.S.S.R. | 16/8/50 | 70·056 |
| ***Special A/C*** | | | | |
| (i) | N. Tvorogov | U.S.S.R. | 17/4/50 | 51·876 |
| (ii) | N. Tvorogov | U.S.S.R. | 28/4/50 | 43·700 |
| (iii) | L. Mouritchev | U.S.S.R. | 14/8/49 | 41·234 |

(* denotes Absolute World Record)




# D.H. 115 VAMPIRE TRAINER

EACH year the S.B.A.C. Show forms an appropriate occasion for new aircraft to make their first public appearance, and at the last show the Vampire Trainer was certainly the newest machine present. So new, in fact, that it came by road, and while to all intents it was a completed newcomer when on show in the static park, much internal wiring and plumbing had still to be completed before the maiden flight. This was made by John Wilson on November 15th, 1950, from Christchurch.

The decision to go ahead with a trainer version of the Vampire was taken at the end of June, 1950, and with the S.B.A.C. Show only two months off, day and night work was necessary to complete an airframe for showing. The D.H.113 night fighter of the previous year proved the practicability of a two-seat layout for the Vampire, and it was from this aircraft that the trainer was developed. With the De Havilland design staff already fully engaged, the Vampire Trainer project was handed over to the associated company, Airspeed Ltd. Accordingly a night fighter fuselage complete with engine, and the original mock-up, were transferred to the Christchurch works. Wings, booms, tail unit, etc., were acquired from sub-contractors and these were standard Mark 5 components.

The Airspeed design team won extra inches to total 44 ins. in cockpit width, by lowering the canopy rails and so enabled the two seats to be mounted side-by-side, an improvement on the slightly staggered arrangement of the D.H.113 and the ancestral Mosquito 3 trainer. The already long night fighter nose was lengthened by 5 ins., and so the trainer also features its forerunner's tall, pointed rudders, reminiscent of those fitted to the very first prototype D.H.100 Vampire. To cope with the forward shift of the C.G., the tailplane trim tab was increased in span and all machines following the prototype will have extended tailplanes as shown on the accompanying G.A. drawing.

Full military equipment is carried including four 20 m.m. cannon with 150 rounds per gun and, as Mark 5 wings are employed, eight rocket-projectiles and two 1,000 lb. bombs or two 100-gallon drop tanks may be carried on the wing racks. The prototype has a D.H. Goblin 33 jet engine giving 3,350 lbs. thrust at 10,750 r.p.m. but future machines will have the Goblin 3 unit of the same power. Access to the pressurised cockpit is by means of the jettisonable canopy top and the cockpit has duplicated flying and engine controls, flight instruments, gun sights, etc.

Jet trainers are not new, but the D.H.115 is the first to seat instructor and pupil side-by-side—an arrangement with real advantages over the separated and long-used tandem layout.

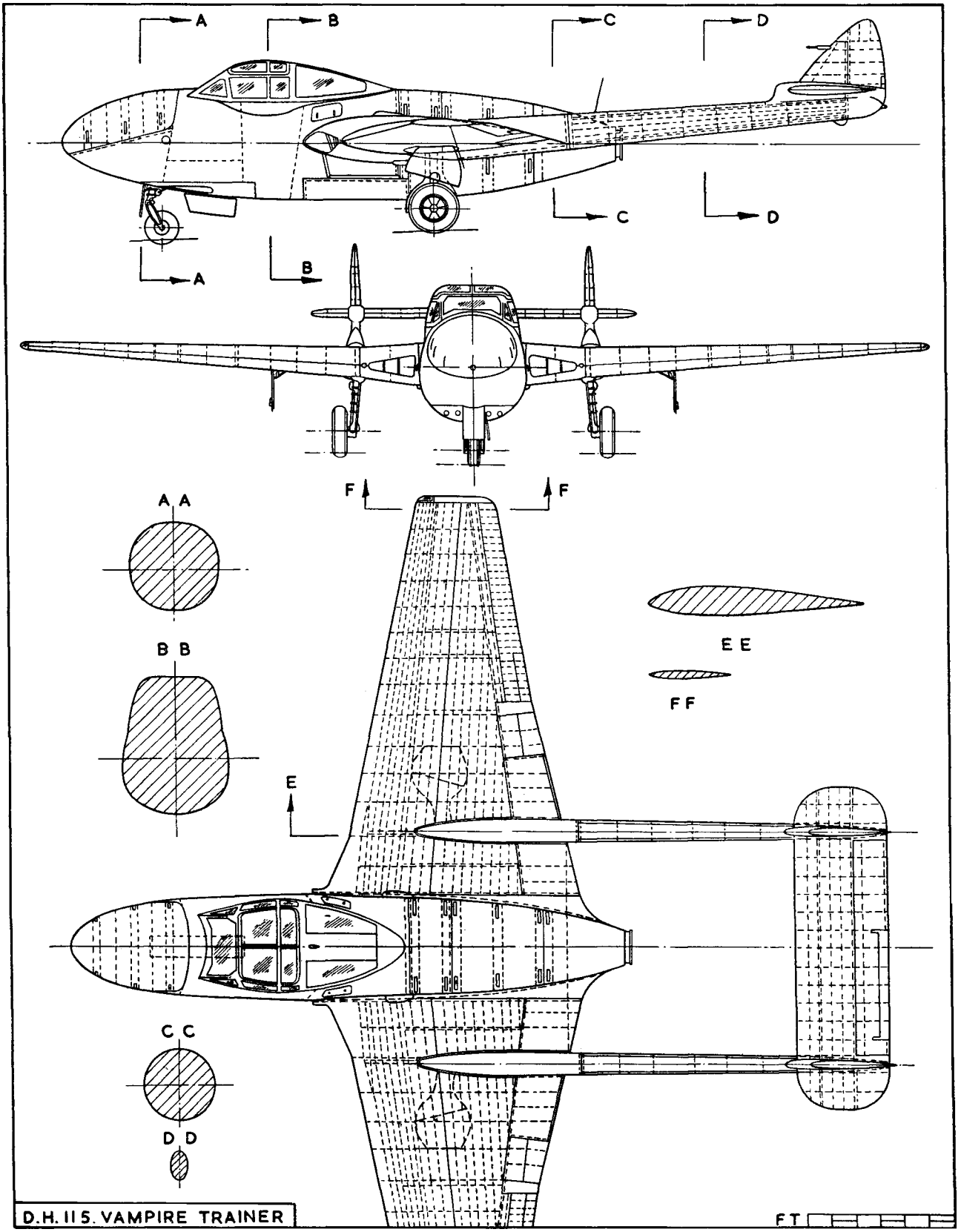
Although the Vampire Trainer has not been produced specifically for the R.A.F., it falls into line with the R.A.F.'s latest side-by-side training policy with which the new Percival P.56 and Handley Page H.P.R.2 elementary trainers comply. It is, therefore not surprising that service chiefs look favourably upon this newest of Vampires and, in view of the fact that single-seat Vampires have been supplied to twelve airforces, it seems likely that the Trainer has a useful future before it.

While piston-to-jet conversion is an obvious duty for the Vampire Trainer, instruction in high speed gunnery, navigation and ground attack with R.P.'s and bombs are other roles in which this aircraft would prove its worth, and there is room in the nose for radar or cameras which would add further to its applications. In an emergency the D.H.115. can be used operationally for it retains all the performance, handling qualities and offensiveness of the Vampire 5 fighter.

**Specification :** Span : 38 ft. Length : 34 ft. 5 ins. Loaded weight (no external loads) : 11,030 lbs. Wing loading at quoted wt. : 42·1 lb. per sq. ft. Max. speed : 548 m.p.h. at 20,000 ft. Climb : 4,500 ft. per min. at sea level. Max. range : 920 miles at 40,000 ft. at 300 m.p.h.

**Construction :** Fuselage built in port and starboard halves, Ply-balsa-ply sandwich back to engine bay. Engine accessible by detachable metal cowlings. Wings are all-metal stressed skin structures with a stub front spar, main-spar and spanwise stringers. Ailerons and hydraulically operated air brakes and split flaps mounted on a rear false-spar. Stub booms built integral with wings. Booms have bulkheads and stringers with stressed skin covering. Tail surfaces also stressed skin over ribs, spars and stringers.

**Colour :** The prototype is satin-silver on all surfaces with R.A.F. trainer markings, i.e. 3 feet wide bands of trainer yellow around wing outer panels and booms. Prototype "P" in yellow on booms forward of band. Experimental registration letters G–5–7 in 18 in. high glossy black letters, on boom yellow bands. Registration in 30 in. high letters below starboard wing and above port wing.




D.H. 115. VAMPIRE TRAINER

FT

# CLUB NEWS

BY CLUBMAN

*Just to remind you of better weather to come? Here is a shot by N. Western Area Delegate Salloway of some of the manlier torsos that predominate in that Area! The occasion was the 1950 Wakefield trials at Fairlop.*

REFERENCE to the list of S.M.A.E. National contests printed on page 145, will indicate a number of radical changes, mainly in the form of certain specialised events that take care of the increasing demand for championship events.

A full scale International meeting scheduled at Whitsun consists of three events, all for power models, and I fully expect one of the best attended meetings on this occasion. At last the "Bowden" event has a chance to establish a better reputation for itself, with the introduction of P.A.A. rules, for there is no blinking the fact that the former precision type of event was extremely unpopular, and received virtually no International support.

Though the entry will be limited to appointed teams, I think the British Championships, competed amongst the different Areas, will prove to be the most interesting event in the calendar, producing as it will the champion Area from the results of the three contests arranged. In addition, the United Kingdom Challenge Match has all the makings of a tip-top annual fracas, and I'm 100 per cent. in support of the event, though some others express some misgivings—mainly on the question of expense. As far as I'm concerned, I feel we should support to the utmost inter-country affairs at home as well as international events abroad.

The whole thing does however depend finally on the amount of financial support forthcoming from all the aeromodellers in this country, and in this connection I urge everyone to do their utmost to make the 1951 Wakefield Draw and other collections a top success. It all swings on the bawbees derived from such affairs whether or not we can continue to send out teams to maintain British prestige in the aero-modelling world. So, go to it chaps, and rake in the shekels for the best of causes.

Despite very bad weather, some 50 modellers attended the **EAST ANGLIAN AREA** meeting for the Joan R. Hooper Radio-control Trophy at Willingale Airfield on the last day of the old year. Although the field was covered in snow, and the temperature a little over 30 degrees, everyone seemed to have an enjoyable time. Seven models were entered, and 1950 Champ. J. A. Gorham of Ipswich proved a worthy winner, getting in two very good flights. Failure of most competitors on the second round was no doubt due to weather conditions; visibility was down to 100 yards, and models flew out of sight a few seconds after take-off. Results :—

| | | | |
|---|---|---|---|
| 1. | **J. A. Gorham** | **(Ipswich)** | **316 points.** |
| 2. | **Mr. Peck** | **(Chelmsford)** | **257 ,,** |
| 3. | **Mr. Dynes (Sen.)** | **(Battersea)** | **177 ,,** |

Area activities are not pronounced during the winter season, but the **MIDLAND AREA** fully intend to change this next "off season" by the introduction of winter contests. Why confine activities to half the year anyway? 1951 will be devoted to collecting all the projected comp. equipment, which in view of future plans has a series of "official hot-water

## CONTEST CALENDAR

| | | |
|---|---|---|
| March | 16–18th. | Northern Models Exhibition. Corn Exchange, Hanging Ditch, Manchester. |
| | 25th. | **GAMAGE CUP & PILCHER CUP.** (Decentralised.) |
| April | 1st. | Surbiton Glider Gala. Epsom Downs. |
| | 15th. | **ASTRAL TROPHY; S.M.A.E. CUP; RIPMAX TROPHY.** (Area.) |
| | 29th. | 2nd North Hampshire Rally. Lasham Airfield, Alton. |
| May | 6th. | **WESTON CUP & HALFAX TROPHY.** (Area.) |
| | 13–14th. | **INTERNATIONAL MEETING; "AERO-MODELLER" R/C TROPHY; BOWDEN TROPHY; POWER DURATION.** |
| | 26–27th. | Precision Power, Stunt, Speed, Team Racing, Italy. |
| | 27th. | **GUTTERIDGE TROPHY & K. & M.A.A. CUP.** (Area.) |
| June | 10th. | **WAKEFIELD & A/2 TRIALS.** Cranwell Aerodrome, Lincs. |
| | 15–16th. | Power Championships & Radio-Control. Paris. |
| | 17th. | West Essex Gala, Fairlop. |
| | 23–24th. | Speed, Salon Challenge & Plymouth Trophies. Paris. |
| July | 1st. | **MODEL ENGINEER CUP; WOMEN'S CHALLENGE CUP; POWER 1.5 c.c.** (Area.) |
| | 7–8th. | Wakefield Trophy. Finland. |
| | 15th. | **KEIL TROPHY & LADY SHELLEY CUP.** (Decentralised.) |
| July | 21st. | **FESTIVAL OF BRITAIN CONTROL-LINE CHAMPIONSHIPS.** Wembley Stadium. |
| | 29th. | Control-line Championships. Belgium. |
| August | 5–6th. | **BRITISH NATIONALS.** Fairwood Common, Swansea. |
| | 12th. | South Coast Gala Day. Brighton. |
| | 15–20th. | A/2 Glider Finals. Yugoslavia. |
| | 19th. | All Herts Rally. Radlett. |
| | 19th. | **INDOOR NATIONALS—MANCHESTER.** |
| | 26th. | 4th Huddersfield Rally. |
| August to September | 21st. to 1st. | Model Engineer Exhibition. Royal Horticultural Hall. London. |
| | 2nd. | F.N.A. Cup. Holland. |
| | 2nd. | **FARROW SHIELD; FLYING SCALE; JETEX.** (Area.) |
| | 16th. | **BRITISH CHAMPIONSHIPS & TAPLIN TROPHY.** |
| | 30th. | **DAVIES TROPHY.** Team Race League Finals. |
| October | 7th. | **UNITED KINGDOM CHALLENGE MATCH.** Scotland. |
| | 14th. | **FLIGHT CUP & FROG JUNIOR CUP.** (Decentralised.) |
| | 28th. | **HAMLEY TROPHY.** (Decentralised.) |
| November | 17th. | S.M.A.E. Annual Dinner & Prizegiving. |
| | 18th. | S.M.A.E. Annual General Meeting. |

(National Contests in bold Capitals.)

bottles " as an absolute must ! The Area has lost the services of Sandy Lowe, ex P.R.O., who has gone to London in the service of a national newspaper.

Sam (Fiddler) Messom has a rival in the new secretary of the **SHEFFIELD SOC.** of A. M. George (henceforth known as " Second Fiddle ") Wilkin, the new can-carrier, is anxious to contact other clubs with a view to giving reciprocal talks and film shows, as these appear to go down much better when given by a non-member ! A very interesting lecture was that given to some 150 modellers by Councillor Allott, President of the British Helicopter Society. This club put on a very fine exhibition in January, at which I had the honour of judging the exhibits, awarding top places to W. Gregory (gliders), A. Naylor (rubber), G. Cartwright (power), W. Farrance (scale), R. Cooke and A. R. Collinson (C/line) and M. F. Crowe (solids). The general standard of exhibits was very high, and in all it was a fine show.

The **WOODLANDS M.F.C.** must be unique, as I am told they possess their own transport—not too comfortable but cheap, and accommodates about 26 with coffins ! Last season's one and only success was J. Bridgewood's winning the " E. J. Riding Trophy " at Woodford, but we hear of more scale work from these lads, Mr. Bromily being busy with a scale free-flight " Lancastrian ". Span is 52 inches, and two Mills ·75's supply the power, revs. being controlled by pendulum throttles.

It was my privilege to attend the **WEST ESSEX AERO-MODELLERS'** first annual Dinner during January, and a reet bright night it was too. The " stag " atmosphere was somewhat handicapped for part of the time, but this was soon remedied once the lone female had departed ! Max Coote considerably enlivened the proceedings by installing his recording machine, which added to the mirth when various extracts of song and story were played back. Never knew I sounded so lousy to others ! ! Popular Secretary Doug. Gordon was the recipient of an award from the lads as a token of their esteem, whilst " Stoo " was inducted as a member of " The Order of the Weasel " and presented with a tastefully decorated " Stoo-pot ". Come in handy on some fields ! ! !

The **WEST COVENTRY M.A.C.** are another crowd extending flying into the winter season, and find it well worth while. A good crowd was present when the club's first R/C job took the air—after the actuator had given a spot of bother—and K. Barton was well and truly " prayed for " as he manoeuvred the job around. After diversion from the one and only tree (traditional modelling this) the job hedge-hopped and circled over the road, a near-crash being luckily averted before the machine was brought back after passing under (some say through !) the telephone wires—and thus R/C modelling progresses.

Following something of a lapse after the farewell of Dick Twomey, news comes again from the **AMPLEFORTH COLLEGE M.A.C.**, where brother B. J. and M. Pitel continue to keep the flag flying, having won most of the local contests with very good flying. Many " above maximum " flights have been recorded during the season, and it augers well for the new season that many good machines are producing the results.

The recently formed **BROUGHTON & D.M.C.** has considerably increased its membership as a result of the notice given in these columns, juniors and seniors being about equal in numbers. A whist drive helped the club funds, said cash going towards a much-needed stopwatch.

The 2nd North Hampshire Rally, jointly organised by the **ALTON & D.M.A.C., R.A.F. ODIHAM & D.M.A.C.,** and the **BASINGSTOKE M.A.C.**, will be held on Sunday, 29th April, the venue being provisionally fixed as Lasham Airfield, near Alton. Full details can be obtained from the Alton club sec., Mr. A. J. Hunt, 75, High Street, Alton, Hants.

The **BLACKPOOL & FYLDE M.A.S.** continue to push out a very attractive club magazine, their Xmas issue being a very worth while compilation. A fair concentration on Wakefields is evident from recent " technical " discussions in the mag., though the following list of records shows that they are good enough at most types of flying :—

| | | |
|---|---|---|
| Open Glider | J. Owen | 8 : 35 |
| Open Rubber | M. J. Davidson | 10 : 51·5 |
| Wakefield | C. J. Davey | 8 : 39 |
| Biplane | C. J. Davey | 1 : 35·4 |
| Tailless | C. J. Davey | 1 : 32·7 |
| Power | C. J. Davey | 9 : 24·9 |
| F.A.I. Glider | J. Pennington | 10 : 18·9 |

Following the usual rush of part-interested members to a new club, the **KNUTSFORD & D.M.F.C.** is sorting itself out, and seems to have got down to a well established nucleus. Three members have gained their " A " Merit Certificates, and one a " B ", and from all accounts a great deal of activity is going on, particularly with team racers. D. Parmenter has an Albon Javelin powered job that clocks 51 m.p.h. and does 90 laps per tankful.

After considerable negotiation with the local Council, the **ASHFORD M.F.C.** has been able to rent an old, disused two-storey brick stable, measuring about 30×15 ft. After somewhat extensive repairs have been completed, they will have a good workshop downstairs and a drawing-cum-general clubroom above. Furnishing is a bit of a problem, but with Secretary Webb in the auctioneering profession, I have no doubt they will soon be decked out with all the trimmings !

The **OUTLAWS (Cannock) M.A.C.** held their third Boxing Day meeting on the high Hednesford Hills, with plenty of snow on the ground, and more falling during the contests. Times were remarkably good considering the conditions, W. Linford aggregating 6 : 55 to win the glider section, and H. Hughes totalling 3 : 47 for two flights to clinch the rubber event.

A special junior programme conducted by the **WEST HANTS. A.M.A.** includes a contest limited to the beginners. Subject is a 20 in. span glider to an original design, and entrants build at the homes of more experienced members, where they obtain the use of gear and plenty of advice, but no actual building assistance. Judging will be on quality of building as well as flight performance. By designing to eliminate waste and pooling of dope supplies, the cost of the model has been scaled down to a real all-in price of two bob.

Due to prevailing weather conditions, not much flying has been done by the **WHITEFIELD M.A.C.**, but Wakefields have been aired to good purpose. A couple of reasonably calm days over the Xmas holidays saw the testing of two new jobs designed to the 1951 rules, these being a slab-sider by Bob Woodhouse, and a diamond pylon (called the " Borderline ") by J. O'Donnell. The latter job features very light construction (3·8 ozs. and 4 ozs. plus rubber), and managed 4 : 50 o.o.s. on 200 turns.

The **CHESTER M.A.S.** lads have suffered a set-back owing to the loss of Hawarden Aerodrome, the " powers that be " having decided that model flying should not mar the ground there. This, coupled with local council restrictions has left them like a duck without a pond, but they refuse to give up. Amongst many other items under construction, experiments have been carried out with return gears on both Wakefields and a canard, and the general verdict is that they are well worth while. How that old pendulum does swing !

Another club to try its hand at running an Annual Dinner is the **WEST BROMWICH M.A.S.**, and in spite of some trepidation on the part of the committee it proved a great success. Some 30 members and wives attended, a most important guest being the farmer who places his fields at the club's disposal. Prizes presented went to P. Littley, N. A. Groucutt, R. Clarke and D. Aston for their prowess in power, rubber, glider and C/L stunt flying. A/2 gliders are receiving the bulk of attention at present, with R/C a close second.

In spite of a long silence, I am assured that the **GREENFIELD M.A.C.** is still alive and kicking, though more members would be welcomed. They have a fine flying field and a room where indoor flying takes place every Thursday, so anyone in the area should have a word with Secretary C. Jones of Nook Cottage, Greenfield, Oldham.

Despite fog and ice-bound runways, the **SUNDERLAND & D.M.A.C.** managed to get in some flying over the Xmas holidays, Mr. Mason flying his Mills powered " Pacemaker " away into the fog on Xmas Eve, and thus remaining a shadowy figure in the mist for the next few days ! The stunt boys put on their own version by flying two stunt jobs in the same circle. I am told that to see one aircraft beetling round, with another flying inverted in the opposite direction is a good antidote for doziness !

Note. The fourth Annual Rally of the **HUDDERSFIELD AIR LEAGUE M.A.C.** will be held on Sunday, August 26th, so make a note for your competition list.

Forthcoming meetings of the **RADIO-CONTROLLED MODELS SOCIETY** are as follows :—

Manchester Group : February 17th. 2.30 p.m. Milton Hall, Deansgate.

Tyneside Group : February 23rd. 7.30 p.m. Demonstration of mechanical Tx box.

Birmingham Group : March 3rd. 2.30 p.m. Birmingham University.

London Group : March 11th. 2 p.m. Horseshoe Hotel, Tottenham Court Road.

**WEST YORKSHIRE M.A.S.** have already started to bring home the pots for 1951, W. Farrance winning the " Woollard " Trophy at the Sheffield exhibition for the best model in the show. (You owe me a pint Farrance !) His model, a 66 in. version of the " Seagull " amphibian was powered with an Amco 3·5. Another very good scale job by E. Farrance gained a Highly Commended, this model being a 45 in. Luscombe Silvaire finished in a high blue gloss. (Incidentally, it would not be amiss here to state that if only chaps would not aim at a super gloss polish on a non-speed job, they would usually score more points. The slightest defect is amplified when a high polish is applied—and in any case, where does one see a mirror-like finish on a full-size aircraft ?)

Attendance at **BRISTOL & WEST M.A.C.** indoor meetings has improved this winter, and talks given on construction and trimming have been well received. Little interest is shown in indoor flying, the main attraction seeming to be the chance of a natter over a cup of tea. Well ! ! In an effort to increase interest, the club has been divided into two " wings ", each side collecting points during the season for a trophy.

The lads of the **OLDHAM & D.M.A.C.** were more than a little surprised to find that a self-appointed " moving finger " had been at work in the clubroom, commencing operations with some very frank criticisms about club members, and a plea for a concerted effort in improving the club's prestige. An attempt to revive interest in rubber jobs is being made by the offer of a Mills ·75 for the best flight in a rubber comp. The honour of building the largest power job in the club goes to J. Shaw with his own design 8 ft. span model weighing 5 lbs.

In spite of cold, showery weather, six clubs competed on Boxing Day at the **WORKSOP AEROMODELLERS'** get-together, and though the general standard of flying was quite low, everyone seemed to have a good time. Almost every branch of aeromodelling is being followed in this club at the moment, with C/L stunt and small rubber jobs predominating. Two new speed records have been made recently as follows :—

| | | |
|---|---|---|
| Jet | Pete Russell (Dynajet) | 137 m.p.h. |
| Class I | Bridget McCann (Elfin 1·49) | 73 ,, |

In contest flying, 1950 was outstanding for the Worksop chaps, who collected 8 firsts, a second, and a sixth—three bods doing all the work between them !

Full marks for a very interesting mag. goes to the **CHEADLE & D.M.A.S.** for their " Torquer "—even though the Editor—office boy—chief-mug did manage to print one page upside down. Just to make it interesting I suppose ! I was flattered to find that some of my old exploits are not forgotten up that end of the country—but how does one go about issuing a writ for libel ? I admit I flew some pretty old models (didn't fly well enough to lose 'em when they were young), but to be accused of shabby covering . . . oh well, could be !

SECRETARIAL CHANGES

ST. HELENS M.A.C.
J. S. Hirst, " Bath House ", Boundary Road, St. Helens' Lancs.
COVENTRY & D.M.A.C.
G. Ginns, 51, Macauley Road, Wyken, Coventry.
KINGS LYNN M.C.
L. F. Smith, 16, Wyatt Street, Kings Lynn, Norfolk.
BLACKHEATH & HAKESOWEN M.A.C.
C. P. G. Wheldon, 59, Carter Lane, Quinton, Birmingham 32.
SOUTH BRADFORD M.A.C.
K. Grice, 16, Powell Avenue, Little Horton, Bradford, Yorks.
CHORLEY & D.M.A.C.
G. D. Bridge, 7, Westminster Road, Chorley, Lancs.
ERDINGTON & D.M.A.C.
D. G. Brodie, 121, Wheelwright Road, Erdington, Birmingham 24.
BRENTWOOD & D.M.E.S.
D. White, 38, Kings Road, Brentwood, Essex.
TROWBRIDGE & D.M.A.C.
J. Russell, 18, Jenkins Street, Trowbridge, Wilts.
PARK M.A.L.
J. Simpson, 35, Victoria Road, Mitcham, Surrey.
WOODLANDS M.F.C.
T. Stead, 63, Grange Road, Woodlands East, Doncaster, Yorks
NORTH SHIELDS M.A.C.
D. L. Shawoross, 1, Clevelands Crescent, North Shields.
WEST MIDDLESEX M.F.C.
B. L. J. Neal, 73, Eastmead Avenue, Greenford, Middlesex.
DEAL M.A.C.
F. Hargreaves, Pier Hotel, Deal, Kent.
BARGOED & D. EAGLE POWER CLUB.
H. Anderson, 5, South Street, Bargoed, Glam.
ST. ALBANS M.A.C.
S. F. Savage, 19, Church Street, St. Albans, Herts.
SHEFFIELD S.A.M.
G. H. Wilkin, 206, Heeley Bank Road, Sheffield 2.
GODALMING & D.M.F.C.
C. S. West, 111, Pondfield Road, Farncombe, Surrey.
SLOUGH M.A.C.
F. C. Taylor, 50, Warrington Avenue, Slough, Bucks.
PHŒNIX M.F.C.
F. H. Powell, 2 North Street, Downend, Bristol.
COLCHESTER M.C.
E. Hodgkinson, 25, Wellesby Road, Essex.

## ERRATA

The modeller depicted as paying homage to his " Powerhouse " in the February Club News was E. Collins of Port Talbot—not Cardiff—indeed-to-goodness-look-you !

***In this issue***

| | |
|---|---|
| FSP 418 | RE8 by D. R. Hughes. Flying Scale model of the famous World War I Aircraft. Best flight times 209·5 secs. For ·5 to 1 c.c. engines. 43" span 4/6 |
| CL 417 | Hopit. A 275 sq. ins. high speed Stunt Control Line model. 35" span for 3·5 to 5 c.c. Designed by E. Higlett ... ... ... ... 3/6 |
| D 420 | Topsy by N. Osbourn. A high wing Wakefield model progressively designed since 1947. Average time 5 mins. Span 44" ins. ... 5/6 |
| PET 419 | Clubman. A streamlined Pylon Power model for contest work, by Gus Gunter. Span 50". Rocket climb with 3·5 c.c. ... ... |

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Made and printed in Great Britain by Alabaster, Passmore & Sons, Ltd., London and Maidstone, for the Proprietors and Publishers, The Model Aeronautical Press, Ltd., Allen House, Newarke Street, Leicester. Trade Distributors: Horace Marshall & Son, Ltd., Temple House, Tallis Street, London, E.C.4—C1601
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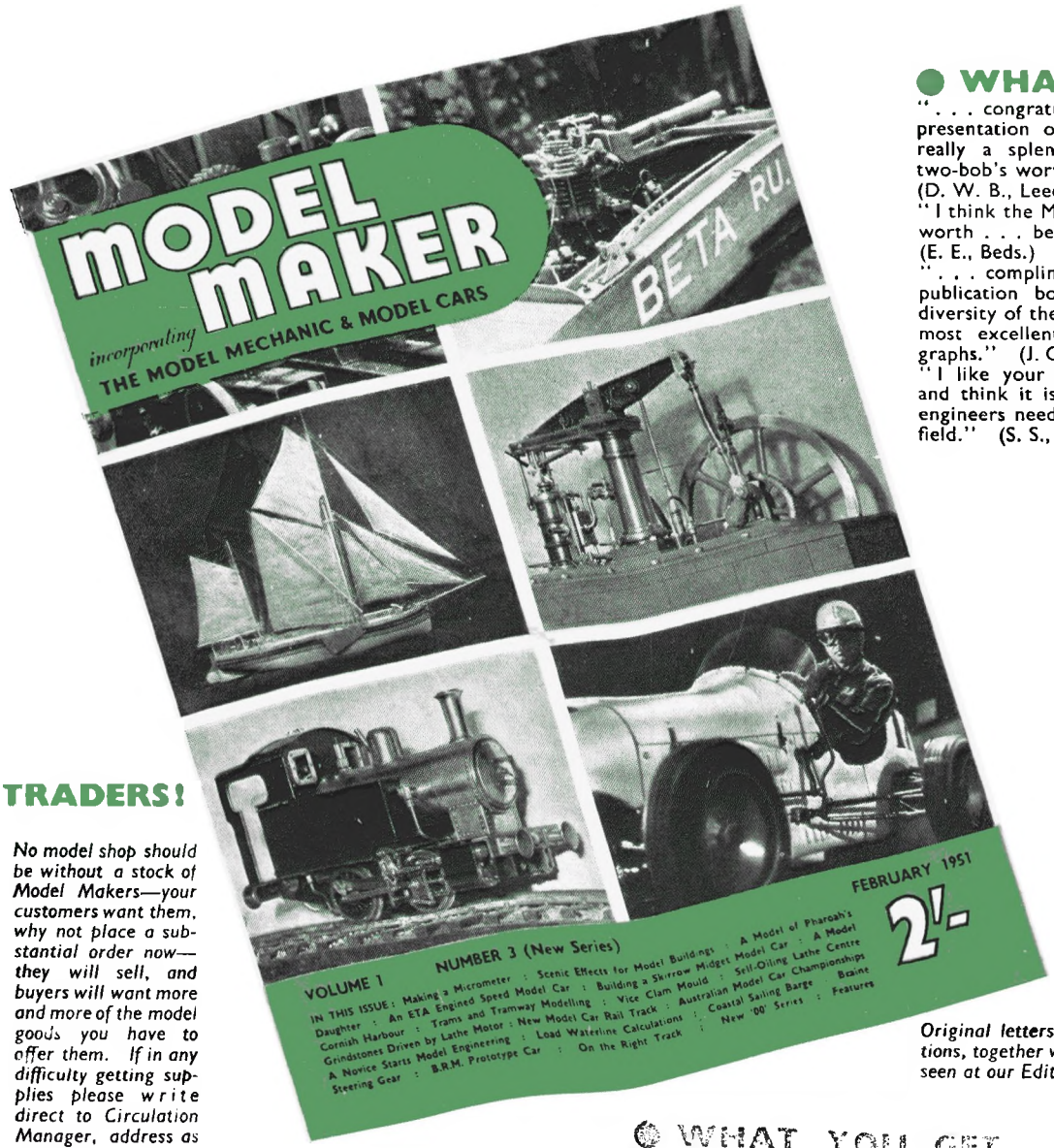


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