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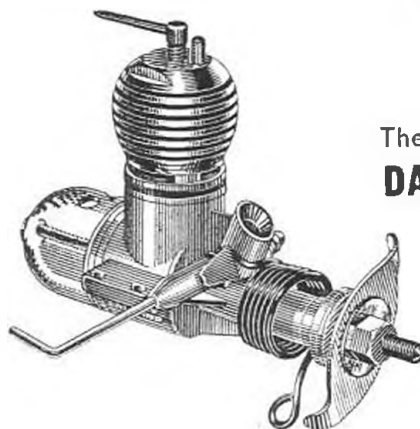
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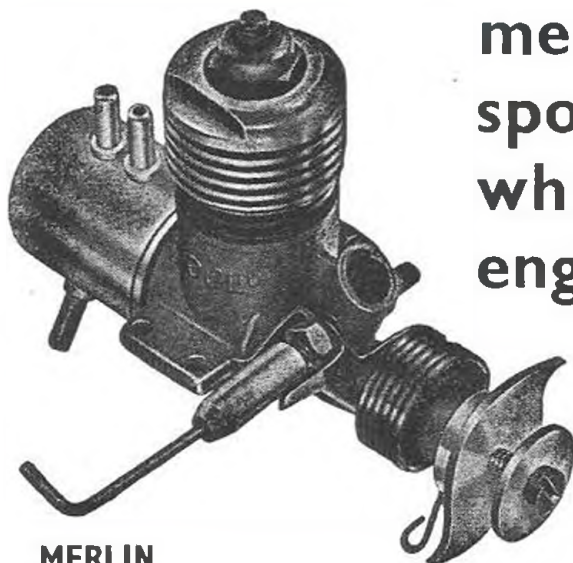
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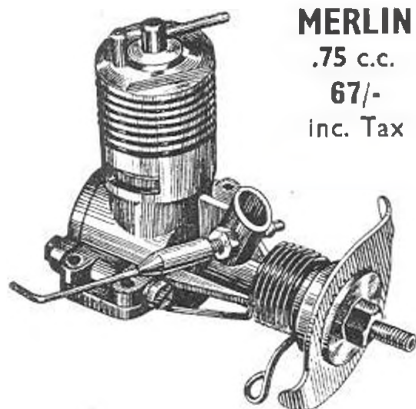
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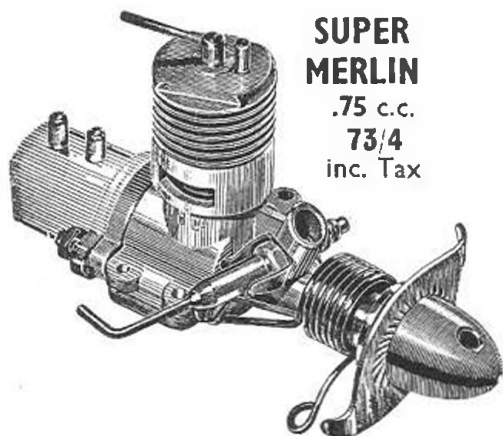
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August 1969

VOLUME XXXIV No. 403

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COMMENT

There is a pleasant charm in the reprinted feature on the 1939 Wakefield Contest in this issue. It contains a sense of personal contact, an experience to remember for ever for the participants and though it involves comparatively few people, has had far reaching effect in International Contest Modelling. Today the organiser is burdened with a triple event in free flight, literally hundreds of competitors and an equal number of timekeepers, clerks and helpers. The personal touch becomes lost in such a crowded atmosphere, and with it goes something we treasure. In place of a friendly sportsmanship, there is a tactical take-over. The game becomes sharp and it is the intense excitement of a World Championship which maintains interest in participation. Methods of finding the winner are certainly more fair than 30 years ago; but we feel that something has been lost in the process towards today's marathons.

on the cover

The plane now landing on platform 1 is the non-stop Harrier single seater from New York City - such might be the public address announcement for this fine evening study of the V/STOL aircraft about to land at London's St. Pancras Station during the recent Transatlantic air race organised by the 'Daily Mail'.

next month

Photo report on the outstandingly successful scale rally at Old Warden. Clemente Cappi's Heinkel He 100 based semi-scale contest stunt control-line design, more Basic Aero-modelling, Control line News, Full size sport plan plus regular features - out August 15th.



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ELECTRIC R.T.P. FLYING (Not illust.)

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ATLANTIC WINGS (Not illust.)

Man's greatest exploratory efforts have always centered upon the conquest of the Atlantic Ocean. Author Ken McDonough traces the authentic history of North Atlantic aerial crossing, 1919-1939 with positively complete factual data and vivid description of each pioneer effort. His superb artwork which introduces every chapter with fascinating wash drawings of outstanding flights, extends to fine-wash sketches of mechanical details of the aircraft.

The twenty full colour paintings are in themselves a treasure for collectors of all things historical in aviation. Here for the first time between one set of covers is the truly complete story. The Sopwith 'Atlantic'; Lindbergh's 'Spirit'; Balbo's 'Savoia Marchetti'; Kingsford Smith's 'Southern Cross' and the famous French aircraft, the Brequet XIX 'Point d'Interrogation'; Levasseur 'L'Oiseau Blanc'; and Bernard 'L'Oiseau Canari' are naturally included in these fine colour plates.

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AEROMODELLER ANNUAL 1968/9

This year's Annual is the 21st and our 'coming-of-age' edition brings no less than 47 of the world's most interesting model designs ranging from an actual size indoor flyer to world champs winner 'Milestone' features include George Aldrich on Secrets of Speed, engine tuning and fuels; Theory of Model Flight; Aeromodellers who've made their own full-size aircraft; Noise explained; The new Foam Plastic techniques, by Erich Heimann; How to use Epoxy, and how to keep control line tension. Designs include Coupe d'Hiver, Wakefield, A/2, F.A.I. and 1A Power, Open Rubber, Chuck Glider, Hydro, Team Race, Stunt, R/C Multi, Sport, Scale, Tailless. Full cover colour by Lauri Bagley portrays 'Breezy' - a home-built light aircraft built by aeromodellers.

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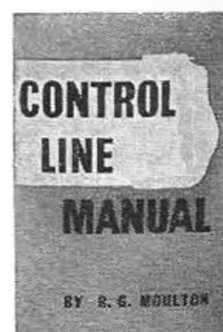
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CONTROL LINE MANUAL

R. G. Moulton

Main chapter headings: Why Control Line? Basic U-Control; Basic Monoline; Basic Flight Control; Learning to Fly; Aerobatics; Speed; Team Racing; Combat; Carrier; Cargo and Endurance. Scale Models; Jet. The Engine in Control Line. Towards the Indestructible; Looking after the Lines; Variations on the Theme. Plus appendix. The manual represents the accumulation of 16 years' experience by the author in the flying of control line models, including the pioneering of aerobatics, team racing and combat in Great Britain.

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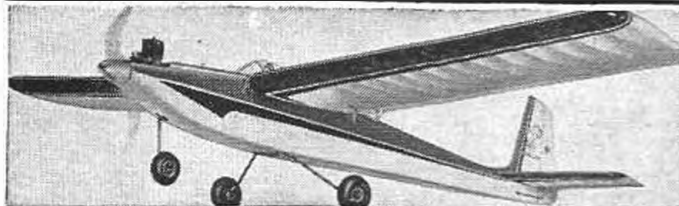
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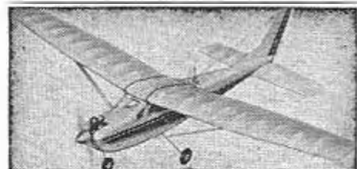
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 30 mm. 4/6 35 mm. 5/3
 40 mm. 5/11 45 mm. 6/9
 50 mm. 7/9

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 10swg single nose leg 3/11
 12g leg with 2" wheel 10/6
 10g leg with 2 1/2" wheel 11/6
 5/32" single nose leg 5/6
 10g twin leg, 2" wh. 19/11
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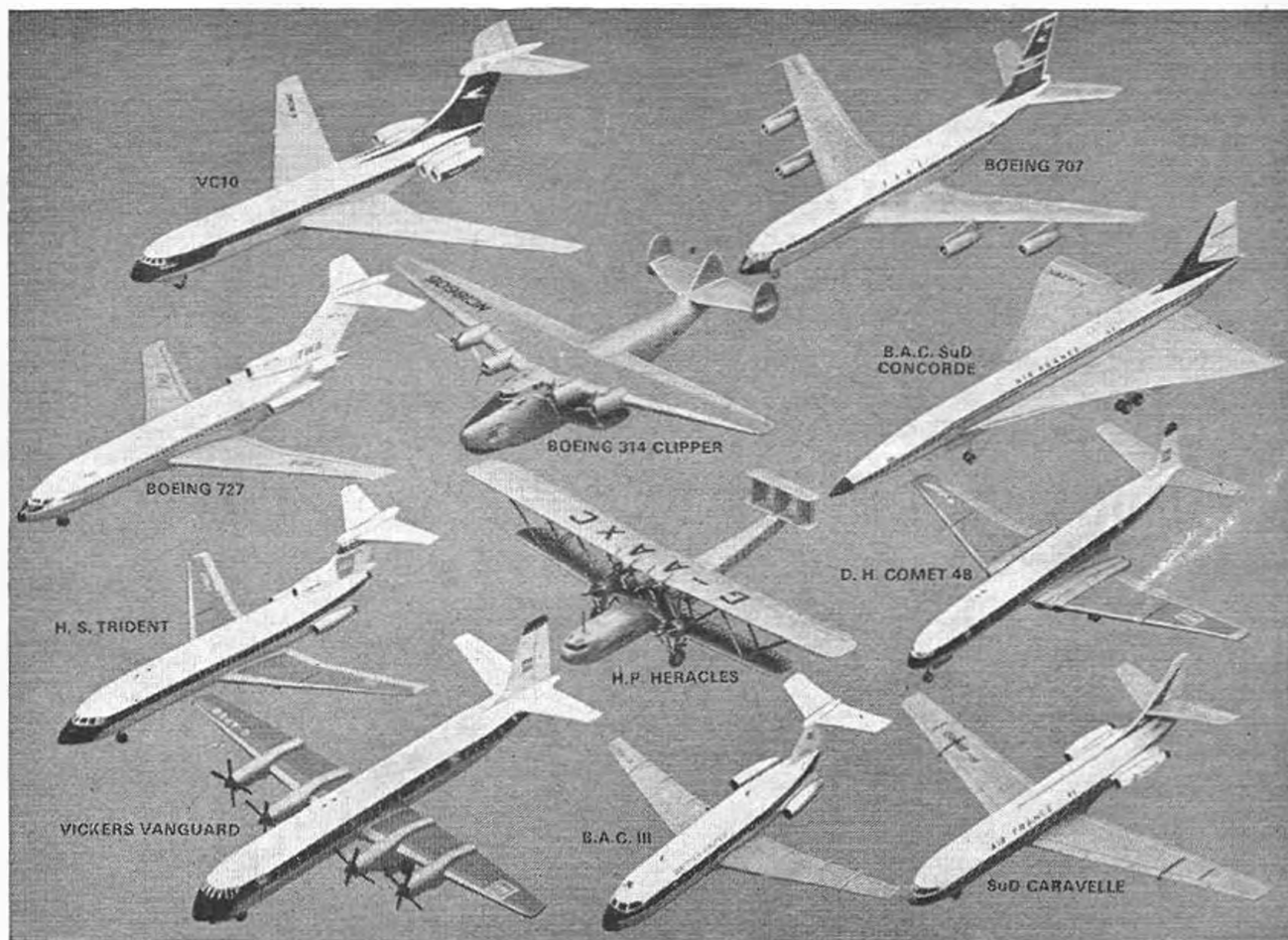
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Response to the sample issue has been overwhelming! Retailers, manufacturers, modellers from all over the world have been unanimous in expressing their enthusiasm for our new title.

Already the pattern of response to our Questionnaire indicates specific demands for features as yet untouched in the field of modelling journalism.

Plans, close-up photos, sketches, colour information, aircraft, armoured fighting vehicles and naval vessels will be regular features.

Quotes thus far from readers of the sample issue:-

'If you continue as this issue you must have a winner'.

'Balance of issue just great'.

'Will be a sure-fire hit'.

'Keep it up!'

'I like everything in Scale Models'.

'A marvellous magazine'.

Scale Models

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**SAMPLE
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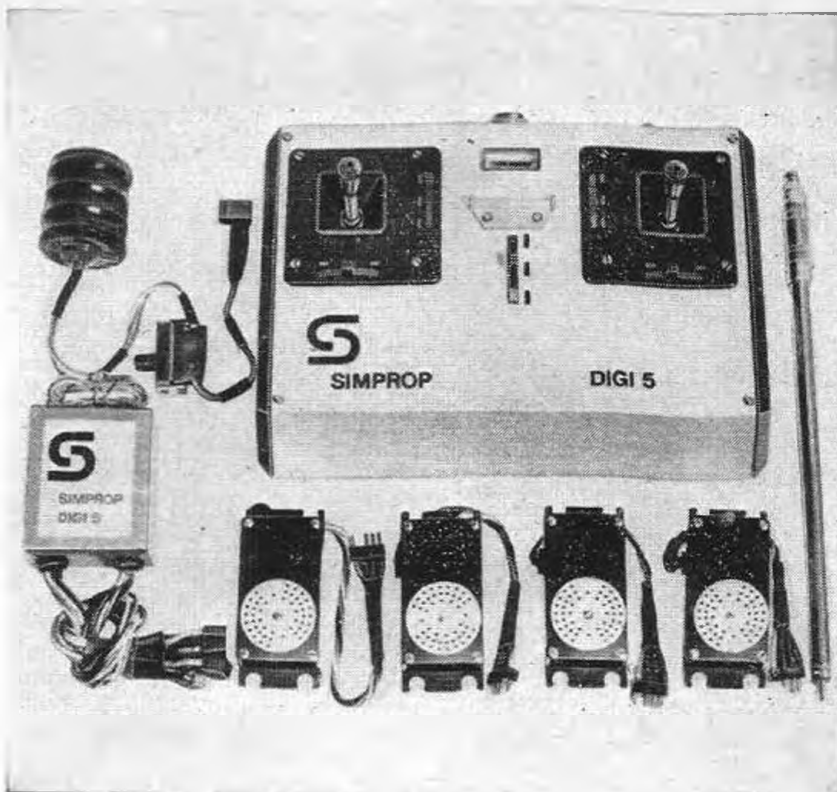
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Enter this great competition when you buy a Mainstream ECS2, Simprop Digi 2 + 1 or Digi 5 during August and September 1969

Think of it . . . The excitingly spectacular radio control system Simprop Digi 5, could be yours — free — when you win this spectacular competition. Just read the specification here and then ask for the entry form from your local model shop! **Mainstream ECS2.** Two Function Digital Proportional. Designed by boat enthusiasts but soon became a favourite with aero modellers.

Simprop Digi 2 + 1. Three Function Digital Proportional. Advanced digital system of international status. Three entirely independent propo functions plus plug-in dual pupil-teacher operation.

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The Receiver: sensitive superhet and decoder; built on one epoxy resin panel, suspended in a metal case, and almost indestructible; 3 microvolt sensitivity (approx); 85g; 60 × 47 × 21mm; plug-in crystals. Battery: 2-piece DEAC 2/500 DKZ complete with harness, switch

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The Servos: Simprop mini type developed for arduous service, with heavy duty gear train for reliability and power. Centering: ±0.5°.

ALL UP FLYING WEIGHT: 18½oz.

The Transmitter: Six spot frequencies in the 26.975 to 27.255 MHz waveband can be selected by plug-in crystals. The two 2-axis stick assemblies are easily interchanged; self-aligning metal bearings eliminate wear; and one-sided rudder neutralisation can be set at will. With a servo, the central trim lever can control a fifth function. Plug-in teacher-pupil operation and battery charging are standard features. The centre-loaded aerial is angle-mounted to stay above the horizontal, and the case shape and layout (which includes an 'early-warning' battery meter) is idealised. Power output: 300 mW; 10/225 DKZ or 10/500 DKZ 12V DEAC; provides 2 to 6 hours operation.



Hurry - the closing date is 30th September!

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MS11

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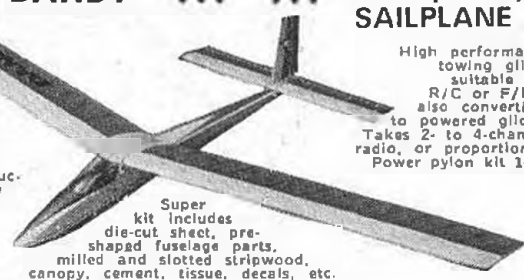
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DANDY

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63" span R/C SAILPLANE

High performance towing glider suitable for R/C or F/F - also convertible to powered glider. Takes 2- to 4-channel radio, or proportional. Power pylon kit 16/6

Super kit includes die-cut sheet, pre-shaped fuselage parts, milled and slotted stripwood, canopy, cement, tissue, decals, etc.

HS 19 CLOUD £13.5.0
Here's a superbly MULTI-PURPOSE model. Fly with 97" span wing for towline soaring, or 75" span for slope soaring (parts for either in kit). Also fly as POWER MODEL with detachable nose "power" egg. Free flight OR R/C in each case!

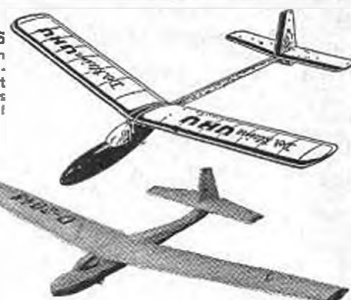
FOKA De LUXE R/C SAILPLANE
102" span £11.12.6
Spare fuselage £4.2.6
Spare canopy 10/-

This fabulous kit includes a FINISHED ONE-PIECE FUSELAGE incorporating wing mounts and fairings in high-strength plastic, other parts in balsa and ply (mostly fully shaped), shaped wire parts, canopy, tissue, decals, cement, etc., etc.

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NEW UHU Mark III 43/6
43" span super beginners model with easy construction and a super performance. For free flight only—sport or contest flying! Ideal for use as a club trainer for junior members!

SCHLEICHER K10 £8.12.6
An exact scale model 79" span, equally suited for free flight or R/C. Kit includes FULLY FINISHED foam plastic fuselage; fully prefabricated parts for built up wings, etc. Also adaptable as AUXILIARY SAILPLANE with pylon power egg. Pylon engine mount 22/6



SEE THEM ALL AT YOUR MODEL SHOP

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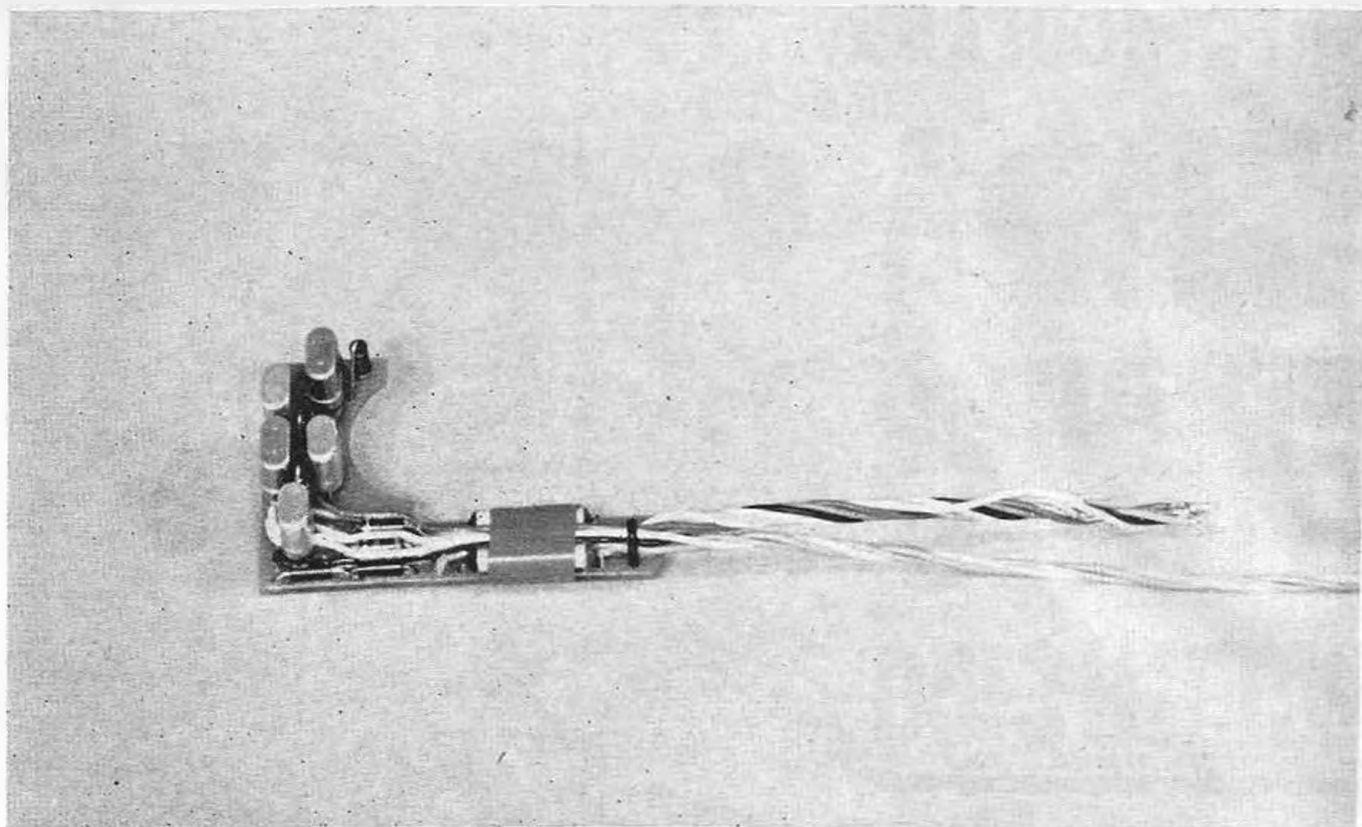
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NOW TAKE THIS SWITCHER UNIT...

It's a scientifically designed electronic circuit using a technique (printed circuit assembly) and components (transistors) which have only come into full scale commercial use during the last decade. It's a tiny, but important, part of the modern radio control model servo – and it costs more than all the Balsa needed for the complete airframe of the model.

There's a moral there somewhere – several, in fact. Aeromodelling has got very much more scientific – and costly – than it used to be. You could buy a new saloon car pre-war for less than the price of today's proportional R/C gear! But there is so much more scope in modern aeromodelling, though Balsa remains the one indispensable constructional material (practically everything else has changed).

To safeguard your investment in expensive gear – or to get the better performance available from today's designs – you need to apply the scientific approach even to Balsa. That's where Solarbo Balsa scores in being selected and graded specially for modern aeromodelling use. It's got the reputation for reliability that goes with a genuine top quality product – more reliable than the electronics the R/C modellers depend so much on. Building with Solarbo Balsa you know the airframe will be the least of your worries!

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£50 MUST BE WON!

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Simple to enter. The pictures of Mainstream Accessories are marked with letters A to L and captions are listed 1 to 12. Place the letter of the appropriate picture against the captions listed on the entry form below. Complete the form and send in *with a card or pack from a Mainstream product you have purchased.*

The panel of radio control and modelling experts will select the winners from correct entries on the suitability of the completed sentence as an advertising slogan.

Please note that the decisions of the judges must be accepted as final and no correspondence can be entered into regarding the competition.

Please enclose s.a.c. if notification of names and addresses of winners is required. Details will also be published in this journal in November. Winners will be notified before October 31st, 1969. Employees and members of their families of Mainstream Productions Limited and of their advertising agents are not permitted to enter.

N.B.

These are only some of the full Mainstream range of accessories that really add to the pride in your models as well as the performance. See them—skin-packed and factory-perfect—for yourself at your local model shop.

Picture Caption

- | | |
|----|-----------------------------------|
| 1 | 'K' link connector |
| 2 | Wing fastener |
| 3 | Metal C/L/B crank (bushed) medium |
| 4 | Metal C/L/B crank (bushed) large |
| 5 | Fuel tube |
| 6 | Steerable nose wheel assembly |
| 7 | Single nose leg |
| 8 | High-speed propshaft |
| 9 | Rudder assembly |
| 10 | Water scoop |
| 11 | Folding deck aerial |
| 12 | Balloon wheel |

Complete the following sentence in no more than ten additional words.

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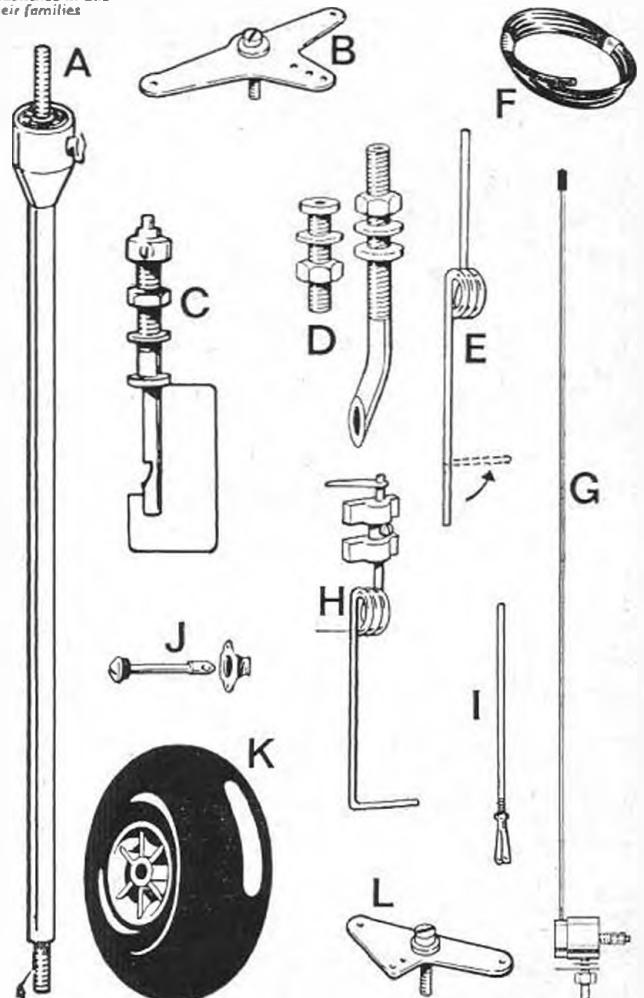
Address _____

No responsibility will be taken for entries lost, delayed or damaged in the post or offered for delivery insufficiently stamped. Proof of posting cannot be accepted as proof of delivery.

Send to: Comp. M.A.1.

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Hurry-closing date is 30th September!

If you want to enter the competition without spoiling your magazine, copies of this entry form can be obtained from your model shop.

MS12

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FIND THE MODEL —

and win a KRAFT 4

**PROPO UNIT
VALUE £169
(or £150 cash)**

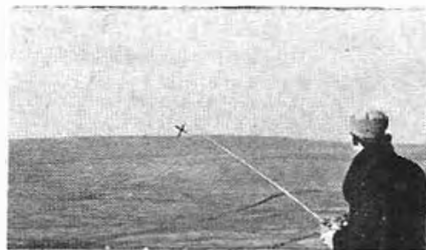
ALSO THREE
NEAR-MISS PRIZES—
"R.S. NAVIGATOR MK.II"
SINGLE CHANNEL UNITS



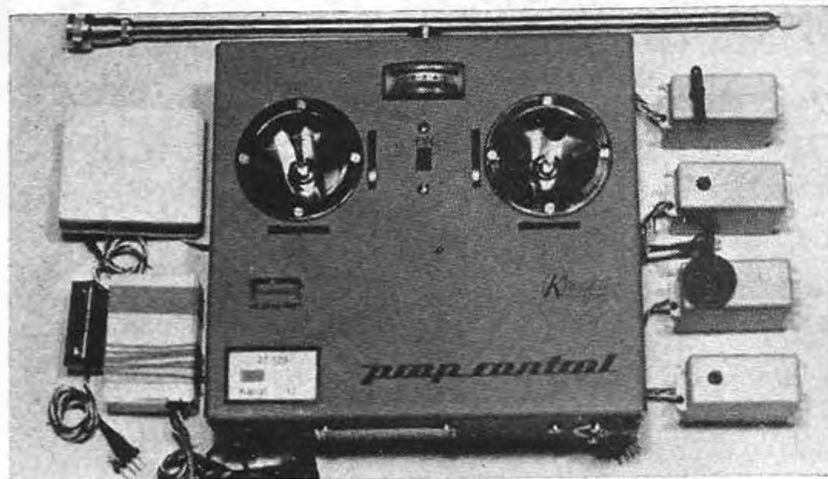
*Be one of the
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KRAFT unit!*



NEWSLETTER AND LISTS
SENT FREE
TO ALL COMPETITORS



THE WINNER OF "FIND THE MODEL
No. 1" P. J. MAGUIRE of 36 Payton Road,
Handsworth, Birmingham 21, who re-
ceives a "NAVIGATOR" PROPO UNIT.
NEAR MISS PRIZES OF "NAVIGATOR II"
SINGLE CHANNEL UNITS WERE WON BY:
D. J. HOWICK, 113 Mina Road, Bristol 2;
J. D. JOHNSON, 11 Wellington Street,
Syston, Leicester.
G. BORN, 1 Fitcher Close, Hallow Road,
Worcester.



RULES

Match your skill with the experts. A panel of experts will study and place, in their opinion, where the centre of the model should be. Use your skill and judgment by marking crosses in ink, or ballpoint pen, where in your opinion the centre of the model should be.

The entrant with the centre of a cross nearest the spot selected by the experts will be adjudged the winner.

Minimum of five crosses and a maximum of 60 crosses per coupon. You may enter as many coupons as you wish. Members of the family may send their coupons in one envelope with one Postal Order to cover all the entries.

Payment must be made by Postal Order payable to Roland Scott Ltd. and crossed.

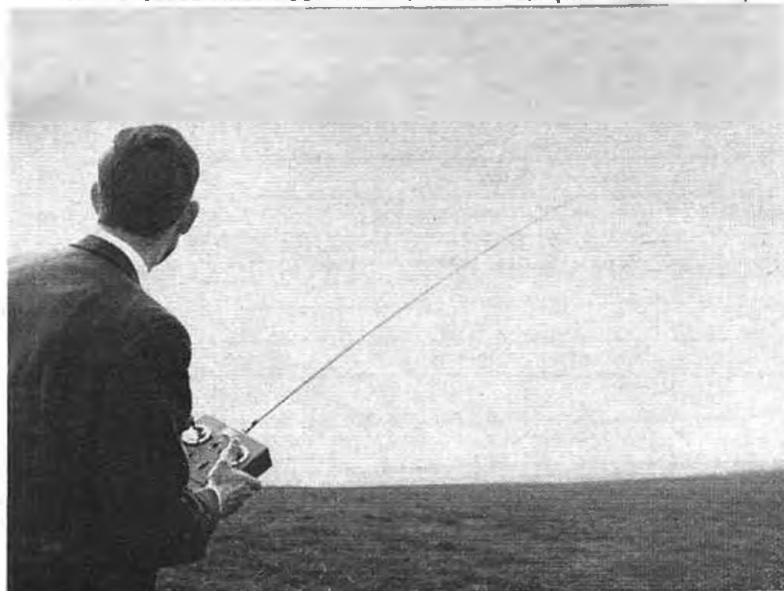
Stamps are not acceptable.

No responsibility is accepted for late, mislaid or lost entries.

No competitor may win more than one share of the prize money in any one contest.
THE COMPETITION EDITOR'S DECISION IS FINAL. NO CORRESPONDENCE MAY BE ENTERED INTO.

Employees of Roland Scott Ltd. and its associated companies and their families may not enter.

ENTRIES CLOSE FIRST POST FRIDAY, AUGUST 8th (two month contest)



5 for 1/- 8 for 1/6 12 for 2/- 18 for 2/6 24 for 3/- 36 for 4/- 50 for 5/-
PLUS 10 free bonus

I agree to abide by the rules of the competition and to accept the Competition Editor's decision which shall be final and legally binding.

Write in Block Capitals please.

I enclose P.O. Order No. Value.....
SEND TO: "FIND THE MODEL" No. 2,
ROLAND SCOTT LTD.,

147 DERBY STREET, BOLTON, LANCs.

NAME

ADDRESS

SIGNATURE

RESULTS WILL BE PRINTED IN AEROMODELLER OCTOBER ISSUE



Left: The 'Cromwell' helmet that saved Lyndon Bedford's life when pierced by the spinner of an Eta 15 (made by his father!) in a model which was gliding in to land at Elliott rally. Right: During the visit to Simprop (see RCM&E this month) Fritz Bosch was presented with a symbolic sculpture of himself 'in action' by Mainstream Directors Frank Allen & Wayne Arnold who make Simprop gear in the U.K.



HEARD AT THE HANGAR DOORS



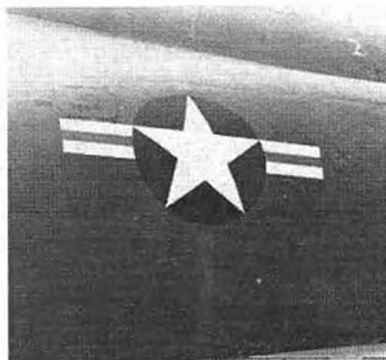
LIFESAVER is the only term to apply to the rule requiring Rat and Team Race mechanics to wear safety helmets. See damage to a standard, inexpensive H.L. 'Cromwell' above. Wearer L. Bedford was knocked sideways, stunned and cut, but he lives to prove the point that even without the engine running, a control-line model could create a fatal accident. Organisers in Elliott MEC recommend that combat flyers should also wear a helmet.

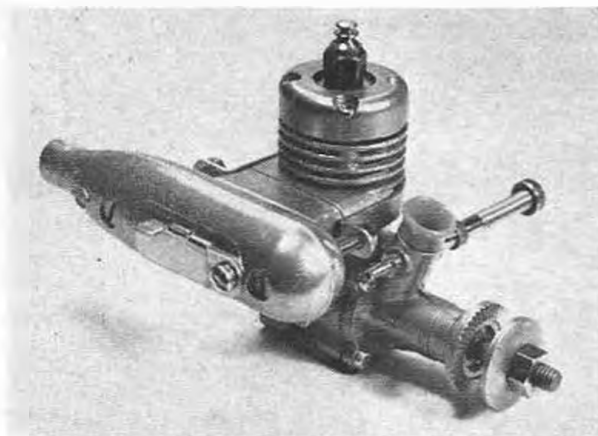
SUCCESS at Metz Scale Internats deserves prompt telling and so displaces our Nats sequel this month. British contingent put up such a good show that the French are anxious to have another team of R/C modellers over on September 28th for the annual 'Cigognes Circus' at Bretigny where only crazy type models are flown (*spéciaux ou extraordinaires*). Any takers? Limbo or balloon busting artists would be welcome. Francis Plessier tells us it's the biggest R/C event held in France.

FLY FOR FUN demonstrations embracing home-built aircraft, gliding and of course, aeromodelling take place at Sywell aerodrome near Northampton, September 13/14th. Flying displays will include aerobatics, parachuting, parascending, helicopters, autogyros and gyrogliders. There will be generous prizes for various full-size aircraft activities, and to match that attraction **AEROMODELLER** is offering special prizes for the best models entered in the Concours d'Elegance static show. Bring along your pet beauty, place it on show by 11.30 each day in the model display tent and we'll award prizes at 5.30 p.m. each day. All classes welcome.

OVER one hundred models, flown by almost 50 SMAE members will represent the U.K. in World Championships at Bremen and Wiener Neustadt, plus international contests in Belgium and Switzerland during the next few weeks. Moreover, there will be over a hundred British supporters spectating at Bremen and countless others at Genk and in Austria. To show the flag, we are offering, free of charge, a Union Jack button badge titled 'British Team Supporter' to all these gallant travellers. Claimants should send details of the event they are supporting, and a stamped envelope (5d.) for return of the 1½ in. dia. badge. All the badge advertisers is the fact that the wearer is rooting for the British team.

PARIS SHOW. Left, for devotees of the Beagle Pup we took these pics to show the 'Bulldog' military trainer variant with sliding hood (no doors), extra span (a foot of flat centre section each side of fuselage) and bigger cowl over the Lycoming engine. Right, new U.S.A.F. insignia on an F-4J without blue surround to bars.





ENGINE TEST

by Peter Chinn

FUJI 12 (2c.c.)

INEXPENSIVE GLOWPLUG ENGINE FROM JAPAN FOR SPORTS FLYERS

NOW HANDLED in the U.K. by Mainstream Productions, the Fuji 12 is basically a bored and stroked version of the Fuji 099-S engine dealt with in this series 2½ years ago. It has exactly the same external dimensions except for a slightly greater height and will fit the same bearer spacing and bolt holes as the 099-S. Its weight is increased by only about 3/10th of an ounce. Swept volume, or piston displacement, on the other hand, is increased by 23 per cent.

Enlarging displacement in this way does not always bring a comparable increase in power but, if our two test motors are representative of average Fuji 099-S and Fuji 12 models, this is not so in this instance. On a fuel of similar power rating to that previously used for the 099-S test, our 12, in fact, developed nearly 30 per cent more power.

At approximately 2 c.c., the Fuji 12 is something of an 'odd' size, falling midway between the popular 1.5 c.c. and 2.5 c.c., or .09 cu. in. and .15 cu. in., groups. Since the engine is intended for general use, rather than for contest type applications (where its 'in between' displacement would put it at a disadvantage by comparison with 2.5 c.c. engines) this is of little consequence. Power/weight ratio, rather than specific output (power/displacement ratio), is more important under these conditions and the 12, as already indicated, offers a substantial improvement here, over its smaller brother.

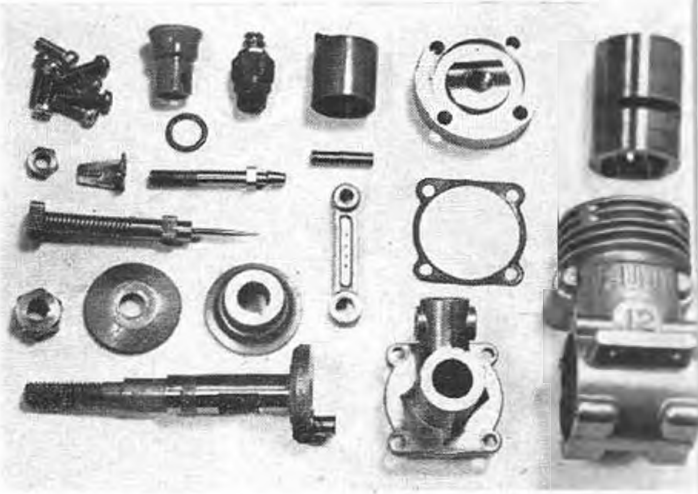
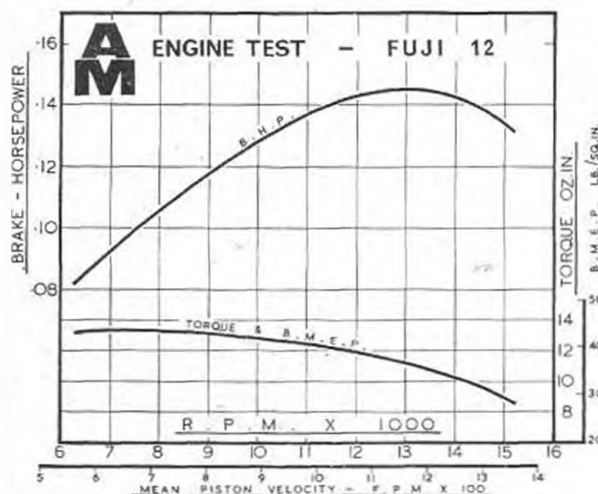
Despite the almost identical appearance of the two engines, few of the 12's component parts are inter-

changeable with those of the 099-S. The main casting, for example, is bored out 1.2 mm. larger diameter to take the 12's bigger cylinder liner. This latter uses a single exhaust port on the right side and, diametrically opposite, twin *internal* transfer flutes—i.e. what appears, from the outside of the casting, to be a transfer passage is actually a 'dummy'. Ports are timed to remain open for 132 degrees (exhaust) and 108 degrees (transfer). Cylinder bore of the 12 is 0.9 mm. larger than that of the 099-S.

The Fuji Bussan Co. Ltd. is one of the few model engine firms to have its own diecasting plant. It is not surprising, therefore, to find that *all* the aluminium parts used in the Fuji 12 are made from diecastings, including the prop driver, prop washer and connecting-rod. In using diecast aluminium for this latter, the manufacturer has wisely taken the precaution of bushing both ends of the rod to improve resistance to wear.

The crankshaft, with an 8 mm. journal and 5.5 mm. gas passage, is similar to that of the 099-S but has a longer crankthrow and appropriately heavier web. A rectangular valve port is used and, on our test engine, this was timed to open very early at 20 deg. ABDC and to close at 47 deg. ATDC. The shaft runs in a cast-in bronze bushing in a separate front housing which has the usual inclined intake boss. This is fitted with a plastic venturi insert held in place by a plated brass needle valve assembly.

The current list price of the Fuji 12 is £4 13s. 4d.,



or £6 10s. 10d. with the appropriate Fuji silencer. This latter is neatly made in two diecast half-shells. A separate short tapered duct adapts it to the 099/12 size crankcase and a mild steel strap is used to tie the whole assembly to the engine. There is a pivoted plate on the outside of the silencer, opposite the exhaust port, through which the engine can be primed.

Performance

The glowplug shown fitted to the Fuji 12 in the illustrations is the standard low-priced Fuji nickel-chromium filament type. However, previous experience of Fuji engines has shown them to perform better on the more usual platinum filament types and the test engine was therefore checked out on Fox, O.S. and Merco plugs. Since the Merco is the more readily obtainable in the U.K., one of these was used for our tests.

The Fuji 12 showed no tendency to overheat or tighten when new and very little running-in was called for. Our test model was given approximately 30 minutes total running time, on 5 per cent nitromethane fuel, prior to testing, to ensure that it was reasonably well loosened up. For the purpose of testing, a commercial mixture, Keilkraft Nitrex-15, was used.

For our tests we fitted the recommended Fuji silencer. Typical prop revolutions recorded, with this, included 8,000 r.p.m. on a 9 x 5 Top-Flite wood, 8,400 on a 9 x 4 Keilkraft nylon, 10,200 on an 8 x 4 Top-Flite nylon, 11,400 on an 8 x 3½ Top-Flite wood, 11,200 on a 7 x 6 Top-Flite nylon, 12,200 on a 7 x 4 Tornado nylon and 13,200 on a 7 x 4 Top-Flite wood.

In general, handling qualities were not so foolproof as those we encountered with the 099-S. Cold starting, using the normal preliminary of an exhaust prime, was reasonably reliable and if the engine was deliberately stopped by closing the needle-valve or pinching the fuel line, a hot restart could usually be obtained by quickly flicking the prop without sucking-in. Warm restarts after refuelling, however, were apt to be delayed and the Fuji was particularly sensitive to being over-choked under these conditions. This could have been a characteristic peculiar to our test unit.

Running qualities were best when the Fuji was propped for fairly high speeds, i.e. upwards of 11,000 r.p.m. At low speeds it tended to hunt, fluctuating as much as 500 r.p.m. if loaded down to less than 8,000 r.p.m. This tended to make it difficult to establish the correct needle-valve setting on such loads. At first, we

SPECIFICATION

Type: Single cylinder air-cooled glowplug ignition two stroke. Crankshaft type rotary-valve induction.

Bore: 13.6 mm (0.5354 in.). Stroke: 13.6 mm. (0.5354 in.).

Swept Volume: 1.975 c.c. (0.1205 cu. in.).

Stroke/Bore Ratio: 1.00 : 1.

Weight: 116 grammes (4.09 oz.) less silencer.
144 grammes (5.08 oz.) with silencer.

General Structural Data

Pressure diecast aluminium alloy crankcase/cylinder unit with drop-in unhardened steel cylinder-liner. Pressure diecast aluminium alloy detachable front housing with cast-in bronze main bearing and secured to crankcase with four screws. Hardened counter-balanced crankshaft with 8 mm. dia. journal, 5.5 mm. bore gas passage and 4 mm. solid crankpin. Lapped cast-iron piston with flat crown and straight baffle. Pressure diecast aluminium alloy connecting-rod, bronze bushed at both ends. Fully floating solid steel 3 mm. gudgeon-pin without end pads. Pressure diecast aluminium alloy cylinder-head with cast-in brass thread insert for glowplug and secured to cylinder casting with four screws. Pressure diecast aluminium alloy prop driver keyed to flat on crankshaft. Plastic venturi insert retained by spraybar assembly. Beam mounting lugs.

TEST CONDITIONS

Running time prior to test: 30 minutes.

Fuel used: (a) 5 per cent pure nitromethane, 25 per cent Duckhams Racing Castor-oil, 70 per cent ICI methanol (running in).

(b) KK Nitrex-15 (test).

Glowplug used: Merco 2 volt long-reach

Air temperature: 68 deg F.

Barometer: 29.80 in. Hg.

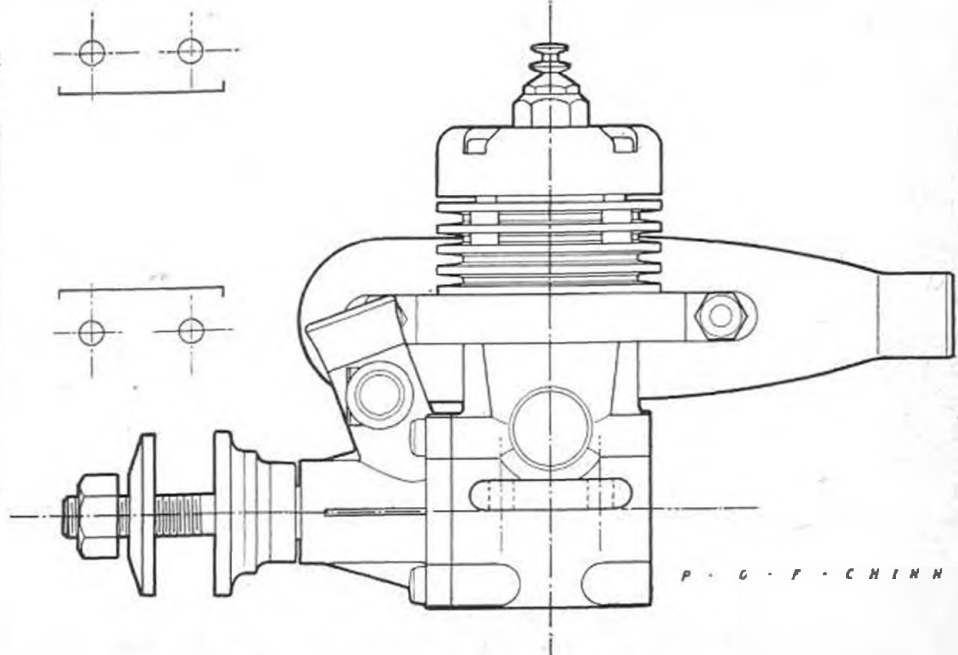
Silencer type: Fuji 099-S/12/15-III expansion chamber

suspected that the needle had been ground off-centre, which, in such cases, does sometimes have the effect of making needle-valve response erratic, but substitution of another Fuji needle made no improvement. However, in order to extract a reasonably high level of power from the Fuji, it is obviously desirable to allow the engine to operate at speeds of not less than 11,000 r.p.m. and preferably nearer 13,000 r.p.m., in the air. The most practical prop sizes would therefore be 8 x 4, 8 x 3½, or, say, 7½ x 3½ for free-flight, and 7 x 6, 7 x 5 or 7 x 4 for control-line.

On test, the Fuji recorded its highest torque at between 7,000 and 8,000 r.p.m. Relative to its displacement, the 12's maximum torque was not quite so good as that of the 099-S and this is indicated by their respective bmcp equivalents of 44 and 47 lb. sq. in. despite the use of a slightly more powerful fuel in the 12, but the 12's torque bmcp curve fell off less sharply as load was reduced and, as a result, its power

continued on page 441

Without silencer the Fuji weighs 4 ounces. Heading illustrates the pivoted plate on silencer for starting.





FLASHBACK

—30 YEARS!

In August 1939 Richard Korda won the coveted Wakefield Trophy with a design that has outlived all others - the famous

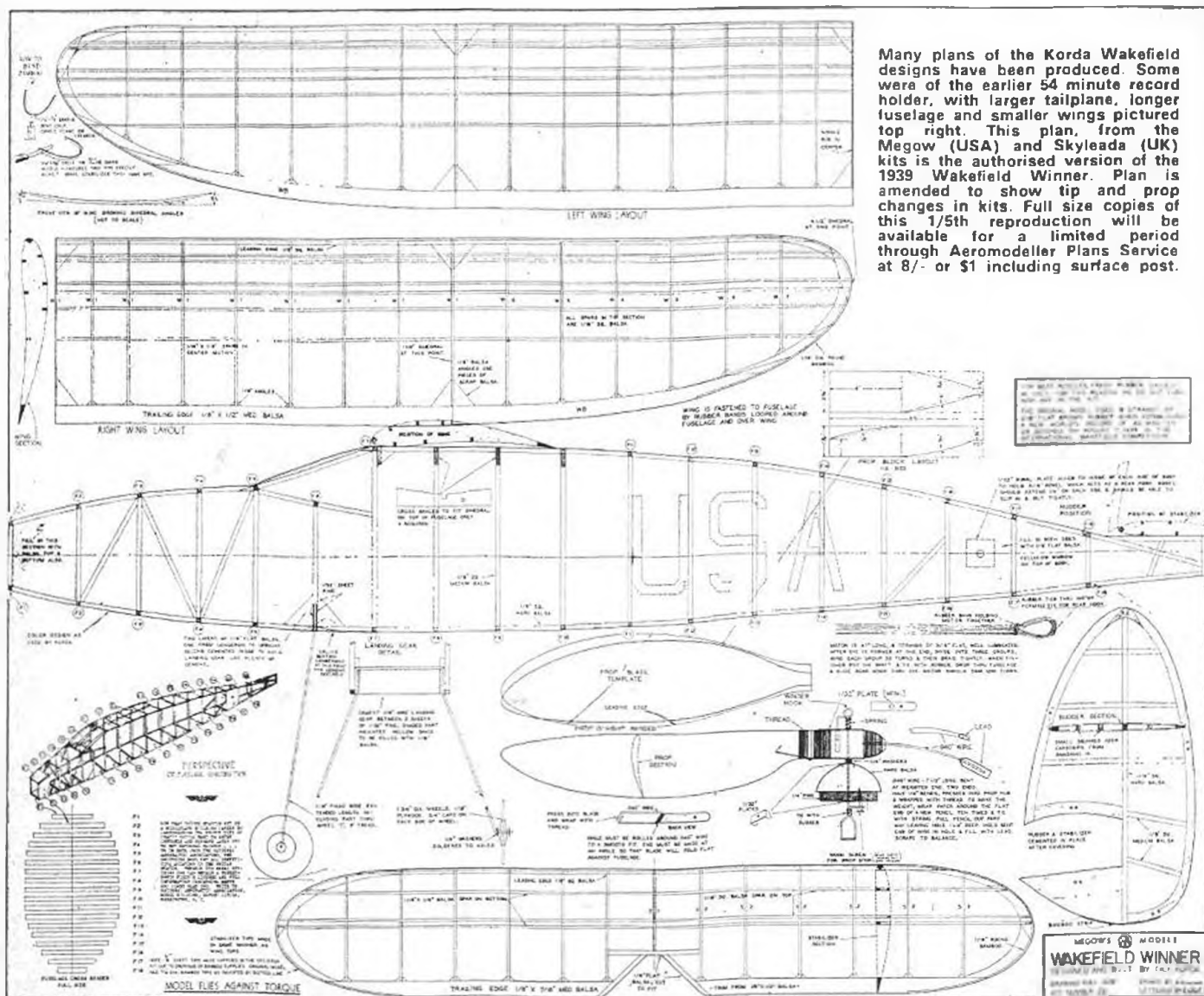
KORDA WAKEFIELD

GOOD-BYE AND GOOD LUCK! With all the best wishes for a successful and happy trip, the 1939 British Wakefield Cup Team left Waterloo via Southampton for New York on Wednesday, July 26th.

The boys were all feeling very fit and looked exceptionally smart in their new S.M.A.E. blazers.

The voyage was uneventful, the weather improving, and as we neared New York the temperature soared up towards the 100 mark and we realised that our greatest problem would come from this direction.

We arrived in New York on Tuesday, August 1st. and were met by the organisers of the contest, Irwin



and Nat Polk, also by our old friend Frank Zaic, Mr. Lieu, Henry Moller and others, who escorted us to the Hotel New Yorker, where provisional bookings had been made.

From our windows on the 18th floor we had a magnificent view of the city and the Empire State Building, which is the tallest in the world.

We learnt on the Thursday morning that Irwin Polk had suddenly been taken ill and had to be rushed to hospital and have an operation for appendicitis. As he was chiefly responsible for the organisation of the affair his brother Nat had to carry on.

On Saturday morning, the day prior to the contest, arrangements had been made to take all the competitors out to the flying ground, which was about 15 miles out of New York.

Impossible contest site

On arrival at the proposed flying ground it was immediately seen this was far from ideal, and an inspection of the spot allocated for the contest proved this to be quite impossible as it was sandwiched between a dense wood and the airship hangar. The remainder of the airport was under long grass except for the runways used by the full-size machines, which of course could not be made use of. The alternative to this was the golf course attached to the aerodrome, which was equally unsuitable owing to being studded with numerous trees and shrubs.

The officials accompanying the team protested strongly against the unsuitability of both sites, receiving full support from the British and American contestants, including the proxy flyers.

After considerable pressure, the organisers made an attempt to fix up an alternative site, but due to lack of available time before the contest this effort was unsuccessful, and there was no alternative but to use one of the sites mentioned.

After a meeting of the contestants and officials it was decided that the golf course possessed fewer disadvantages than the aerodrome. According to English standards even this ground would be considered unsuitable for an ordinary club competition, much less an international contest.

Whilst awaiting the return of the officials, the boys had a flip round the city in one of the 'blimps'. This was an interesting experience, each airship taking up six passengers for each flight.

It was evident that our methods and ideas were totally different to those of the Americans. They almost all favoured short, thick motors which literally tore the models up, whilst our boys had longer motors and a steadier climb.

Top left, Dick Korda and the red Jap tissue covered winner. Nose decoration was in blue dope. Multiple 1/16th spars and single blade 'chopper' were trademarks that many adopted. Earlier version, different in many features, is at top right, while winning U.S. team poses with Wakefield Trophy at the Aviation Golf Club, Bendix N.J. at right. Standing, Bob Chaille, Ted Just (Proxy for Stahl) and Jim Thames, front row, Jim Bohash, Dick Korda and Ralph Baker.

This feature could not have been produced without the co-operation of Frank Zaic, Eddie Cosh and Norman Lees, who produced a magnificent set of photographs, Tim Dannels and John Pond, who provided mint condition plans, Len Stott and Norman Lees (again!) for writing the original account in October 1939 issue; and of course, Mr. and Mrs. R. Korda, who have been extremely kind in granting permission for us to publish Dick's ageless design.



Under these conditions the flights obtained by the English team showed up very favourably, and the Americans freely admitted their apprehension for the contest.

We returned to New York about seven-thirty, and were just in time to hear the weather forecast for Sunday. This was bad from our point of view—becoming warmer, calm at first, wind increasing later in the day. This proved itself to be an accurate forecast.

Later in the evening came the check-up and weighing of the models. This proved something of an ordeal, lasting until 2 a.m., with Messrs. Houlberg, Cosh, York, Faulkner and Lees doing yeoman service in various capacities, the latter working with his slide rule until he fell asleep.

Quite a number of foreign models did not comply with the Wakefield rules and required numerous alterations. Korda's for instance, was underweight, the cross section of his fuselage was small and his tail area too large. To overcome these faults he had to make the necessary adjustments, and submit his model for another re-check in the morning.

The great day arrived, and before we left New York for the contest the temperature was almost 90 degrees, and on our arrival at the field it was stifling hot, as there was no wind whatever. In fact, it was a similar day to that experienced at Guyancourt, in France, in 1938.

In the draw for positions, New Zealand was first, followed by America, Great Britain, France, Canada and South Africa. As the New Zealand entry was scratched, the first machine to take off was that of America's Number 1 man, Dick Korda.

With a great 'zip' his machine took off and climbed almost vertically, in tight circles. It attained a good height under power, and still rising, it was evident it had contacted a thermal. Within a few minutes it was over a thousand feet, and soaring up with each turn.

In the meantime, Charlie Gibson, flying proxy for Fred Almond, who unfortunately could not make the trip, wound up for his first flight, but broke his motor with only three-quarters of the turns on. By the time N. Lees was called upon to wind up, Korda's time was announced over the microphone as 22 minutes,



and still soaring round in circles, almost over the take-off board—a heartbreaking sight for us.

We realised we were up against it, and when Lees' rubber broke, this was blow No. 2 with a vengeance.

As Parham had his model ready, he went off No. 3, but unfortunately, his machine was faultily adjusted, and failed to rise above about 100 feet, his time being 82 seconds.

All this time Korda's machine was still up in sight, having clocked 34 minutes and broken Bob Copland's world record.

The Canadian entry of Fred Bowers had also connected a thermal, and turned in a flight of 12 minutes.

Things were certainly not going too well, and when Copland took off we were hoping for better things. His model, however, took a different direction to Korda's and made a normal flight of 165.4 seconds. About this time Korda's model began planing down, and eventually landed within half a mile of the field after a wonderful flight of 43 minutes and 29 seconds.

Spurred on by this achievement, Len Stott began winding for his first flight, and consternation was pretty complete when his motor broke in the middle. This was a most unexpected blow as we had carried out exhaustive tests on our rubber prior to the competition, and could only be explained by the terrific heat of the day. It was now the turn of Gibson and Hill, but they could do no more than 128 and 80 seconds respectively. The Frenchman, Giovanni, whose machine was being flown by Shoenbrum, had just clocked 9 minutes, the third best flight of the day.

Len Stott now took his first flight, which was something of a gamble, due to the fact that the nose-former of his plane had been knocked out when his motor broke. Our luck was still out, however, his plane made a normal flight of 150.75 seconds, thermals at this time being conspicuous by their absence.

Our greatest blow came now; a stiff breeze sprang up and the sky became overcast. It was obvious that it was impossible to improve on Korda's time. In fact, the Americans were so sure of victory that Korda was freely photographed with the cup—this before the second and third flights were made.

Copland made the best flight of the second round with 308.5 seconds, followed by Stott with 211.5.

The times generally decreased as the day wore on and the best flight in the last round was 195.4 seconds by N. Lees.

From the foregoing it can be plainly seen the contest was over after the first flight.

Once again the Wakefield cup had been won by one outstanding thermal flight, and whilst not in the least begrudging the Americans their victory, one was left with a feeling of dissatisfaction that the trophy should be won in this manner.

There were showers of congratulations for Dick Korda, who is one of the best, and has been consistently successful for many years.

The Wakefield was again over, and though we had gained no honours on the field, we were far the richer in experience. The lessons we learned should be of great value to the team who will compete for the trophy in 1940.

We were, of course, to wait for another nine years before the Wakefield Trophy was held again, when the late Roy Chesterton brought it back after victory in the USA in 1948. Today the contest rules demand regularity in performance over 7 flights and the 1969 event takes place during August at Wiener-Neustadt in Austria.



During the event in 1939, the visiting teams were treated royally, attending receptions and given airline flights. This quartet of Eddie Cosh (now General Manager of Kail Kraft), Mayor LaGuardia of New York City, Bernard McFadden (the U.S. exponent of the 'Keep-fit' movement) and Dick Korda reflects on the high esteem for aeromodelling established through International competition.

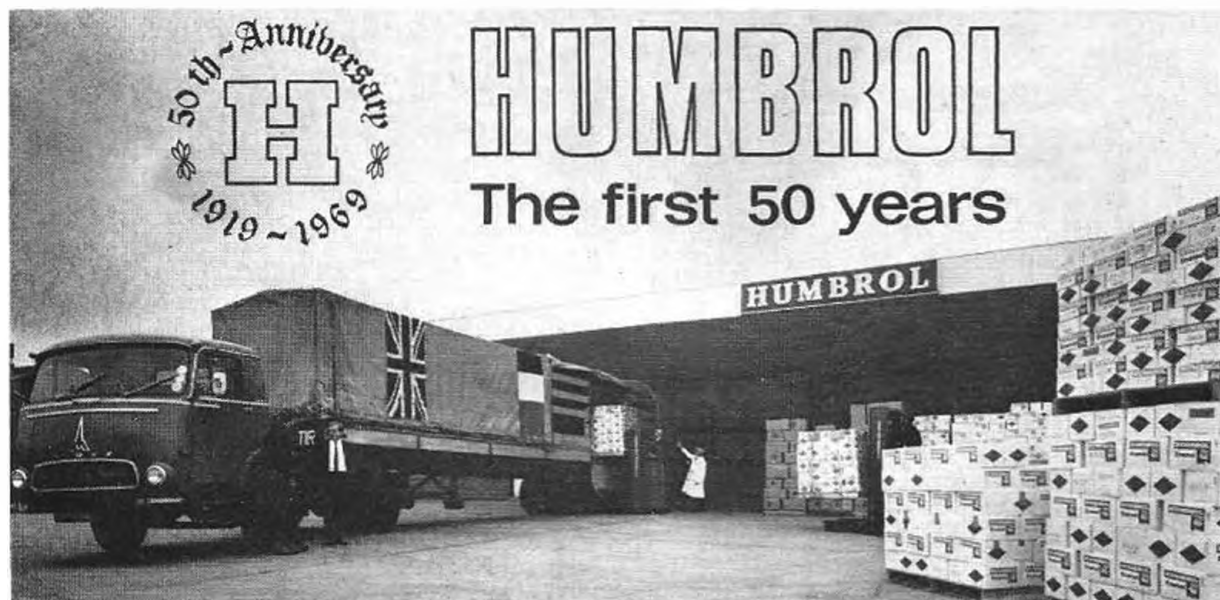
WAKEFIELD INTERNATIONAL CONTEST, 1939

Held in New York, U.S.A.

Dick Korda (United States)	950.2
Fred Bowers (Canada)	272.66
M. Giovanni (France)	217.53
Robert Copland (England)	211.3
Norman Lees (England)	168.87
Robert Chaille (United States)	169.83
Leonard Stott (England)	152.41
Levalle Walters (Canada)	150.83
Vincere (France)	126.33
Edward S. Booth (Canada)	125.86
Charles Gibson (England)	98.1
Reg. Parham (England)	98.0
Tournadre (France)	96.94
P. Chabot (France)	90.03
Phil Dalgety (South Africa)	83.83
Ralph Baker (United States)	81.8
Chinaud (France)	64.66
Ronald Hill (England)	64.66
Ted Foti (South Africa)	59.53
James Thamos (United States)	58.53
Barthelmy (France)	57.01
Spango (South Africa)	54.73
R. B. Leslie (South Africa)	45.83
J. Bohash (United States)	41.63
J. Dilly (Canada)	31.23
P. A. Connolly (South Africa)	30.5
Roy Nelder (Canada)	24.16
Earl Stahl	20.3
Endean (South Africa)	4.0

British group below, aboard their steamship (no jets then lad!) were Charles Gibson, Norman Lees, Bob Copland, the late A. F. Houlberg, Team Manager Eddie Cosh, Reg Parham, Len Stott and Ron Hill. Note the Ties, blazers, baggy pants and buttonhole carnations, a thoughtful gift from the late Mrs. Thurston.





When Board of Trade President The Right Honourable Anthony Crosland M.P. officially opens the new administration block of Humbrol Ltd., the Hull paint and adhesives manufacturers, at noon on July 25th, the keys to the building will reach him in a spectacular way - by single seater autogyro.

To symbolise the firm's 50 year connection with aviation, Wing Commander K. H. Wallis, whose single seater autogyro 'Little Nellie' starred in the James Bond film 'You Only Live Twice', will salute Mr. Crosland with an aerial display of mock rocketry and gunfire before landing in the grounds of the Marfleet factory and handing over the keys. The ceremony will be the highlight of celebrations to mark the firm's Golden Jubilee.

IN 1919 a small factory with a staff of four began to produce cycle oil and calcium carbide. This was the Humber Oil Company - the founder, Douglas S. Barton. His small business began to expand, slowly, and then, in 1930 the company extended its production to include black enamel for cycles. From this new enterprise they gained their first experience of exporting and began to realise the potential of their products. It was then that they introduced the first midget tinlets of enamels.

By 1939 a new factory had been established, the staff had grown to thirty, and, when the second world war started, the Humber Oil Company began to supply cellulose lacquers for the many uses which wartime Britain demanded.

At the end of hostilities it became obvious that the premises would be completely inadequate for the company's ambitious development plans. A site was purchased at Marfleet, near the Hull Docks, and a year later production was in full swing. Another chapter in the story of Humbrol had begun.

Mr. Gerald D. Barton, son of the founder, entered the company after service with the armed forces, and began working in the company laboratories. Always a keen modeller, his expert knowledge led him to experiment with various formulae in a bid to produce a balsa cement which would satisfy his own critical needs. He sent samples to Cam Morgan, the pro-Heading shows yet another huge export order on its way from the works at Marfleet. Right is just one of the stock-rooms where the vast range of Humbrol products are stored for rapid delivery. Constant flow of production and supply are most impressive.

prietor of a modelling shop in Hull. These were so much in advance of competitive products that it was suggested that the adhesive should be put on the market. Thus was *Britfix* Balsa Cement born - it is still produced today, with the same formula, but another name - *Humbrol*.

In the early 1950's plastic modelling kits were introduced and the Humbrol tinlets of enamel, hitherto used mainly for re-painting cycles, began to sell to the model shops. The Humbrol formula was ideal for polystyrene plastic and the sales grew rapidly.

In 1959 a formula was produced which gave high covering power, a quick drying time, and, very important in the home, freedom from lead and other noxious ingredients. Thus Humbrol enamel could be used throughout the home with perfect safety for





children and animals. From that time the company's products in the D.I.Y. field began to grow, and today the $\frac{1}{2}$ ounce tinlets, together with the larger 2 ounce and $\frac{1}{4}$ pint sizes are to be found throughout Britain in the distinctive Humbrol Paint Lockers. In 1964 an aerosol filling line was installed and another success-



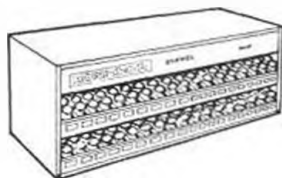
The half-ounce tinlet is a Humbrol speciality, produced in vast numbers and providing the amount and quality which modellers appreciate. Photographs compare the first, with the latest tinlets.

ful product was launched. Always perfectionists, Humbrol technologists believe that a large part in the success story of their Aerosols has been the special 'soft spray' head which they use. This, coupled with the high quality traditional to Humbrol enamels, and their rapid drying time, has brought the company a huge share of a market which is still growing rapidly.

To watch automatic machines filling 300 cans of paint a minute or 50,000 tubes of adhesive today is a fascinating sight. The company's efficient factory employs sophisticated automated equipment on their production lines, and this sort of efficiency is necessary when one considers the colossal export trade carried on. Exports currently go out to well over eighty countries - indeed, in the first seven weeks of their Golden Jubilee year the company exported more than two million tins of enamel. Amongst the principal customers are Australia, Belgium, Canada, Germany, Italy, Japan, Netherlands and Sweden. In fact, one export order to France alone this year was greater than the total exports ten years ago!

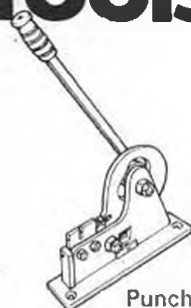
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happy birthday Humbrol!



Congratulations on your Golden Jubilee from J. & C. R. Wood the suppliers of the FAMOUS HUMBROL PAINT LOCKER and wire display stands.

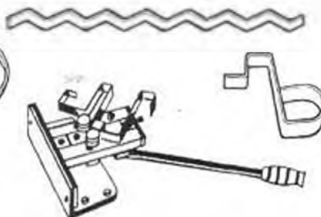
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Rivetting, Bending and Rolling Tool



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Strip Metal and Wire Working Kit £13.0.0
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Plus FREE introductory pack of metal and accessories (worth 25/-)

Add a Scroll Former Tool to this kit and you are fully equipped for Ornamental metal work.

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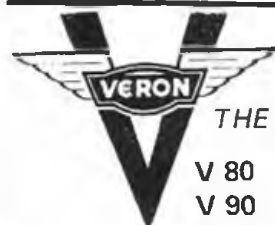
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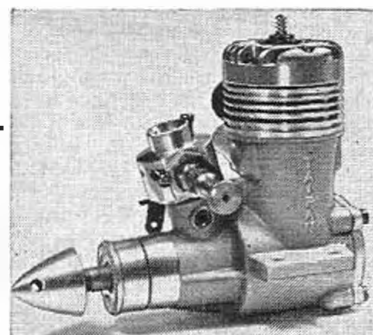
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All this is being achieved by a relatively small private company with a staff of about 250 people, working in a pleasant factory situated in an attractive industrial site in Hull. This is the heart of Humbrol, but it is not the factory alone which is responsible for the phenomenal success story. Right from the early days in 1919 the emphasis has always been on personal relations with customers and suppliers. The chairman himself, together with his sales director, Mr. Victor Duffill and the senior executives of the company, travel all over the world on the business of selling Humbrol. The firm's products have been seen at trade fairs and exhibitions in Paris and Lyons, Stockholm, Sydney, Milan, Malmo, Toronto, Copenhagen, Utrecht, Johannesburg, Valencia, Barcelona, Nuremberg and New York. *'Personal contact and speedy deliveries are the keys to the export trade'*, said Mr. Barton, *'and we try to achieve both'*.

The modern paint locker, which has established Humbrol's point of sale identification for retailers and cash customers alike, contrasts with the company's first product at right, the printed cycle oil can, one of the first such methods of packing.



Enamels are but one section of the company's products. They produce a range of 14 adhesives for the D.I.Y. man in the home, and the modeller, including fillers such as customising body putty and plastic wood. It surprises one to learn that plastic wood from Humbrol, which might be considered to be used mainly by the home handyman, has been sold in large quantities to help make artificial limbs in Nigeria. Not really surprising though, when you consider the important industrial side of the business. Under the genial eye of Sam Sharp, the company's technical director, Humbrol produce specialist finishes for a wide range of industrial uses. A brilliant chemist (a pretty good golfer, too!) Sam is a very well-known figure in the paint trade, and, under his guidance, the Humbrol laboratories have produced specialist paints for manufacturers of toothpaste tubes, caravans, furniture, typewriters, cameras, metal containers and many others. The list is almost endless—even swimming pools are catered for by the Humbrol industrial division! Looking round the factory one is amazed at the cleanliness of the place. Many paint firms have abundant evidence of their products on the floor and walls—and even on the personnel! Humbrol gives one the impression of quiet, automated efficiency. Factory doors are electrically operated, mechanisation

continued on page 417

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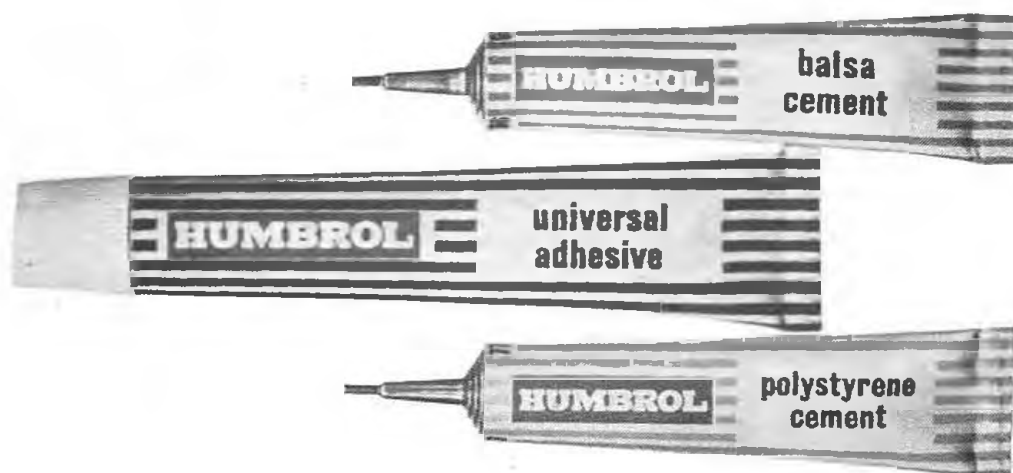
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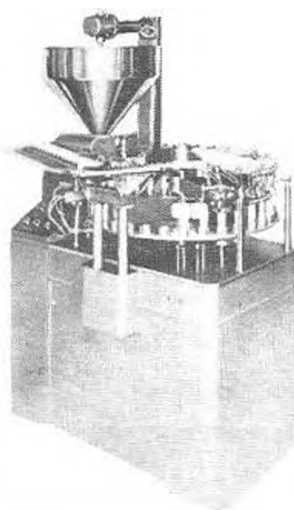
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Flexile congratulate Humbrol Limited on their 50th Anniversary. We are proud of the long standing association between the two companies.

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KINDLY MENTION 'AEROMODELLER' WHEN REPLYING TO ADVERTISEMENTS



Chairman of Humbrol, Gerald D. Barton, whose drive and initiative have created the biggest success story in the British Model Trade in post-war years.

is employed throughout and communications are so good that an executive conference can be held, if need be, without a single man leaving his office! But then, this was to be expected with a live wire like Gerald Barton at the helm. Always an ingenious man, he is constantly searching for the gadget that will perform a specific job more efficiently. His team of executives seem to have been selected for their creative enthusiasm, and, apart from their professional competency, they can all be relied upon to produce information on nearly everything from architecture to zoology!

Continued on page 418

Aero Modeller



HOBBY MAGAZINE

Joins with all the
model shops and their
grateful customers
in wishing HUMBROL
continued success in
the *next* fifty years.

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**MODEL KITS
AND ACCESSORIES**

KEILKRAFT are proud of their long
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sincerely congratulate them on their
50th Anniversary

HUMBROL

FIFTY YEARS OF HONEST TO GOODNESS TRADE



Key to much of Humbrol's success has been in the selection of executives who have particular skills in the production of adhesives and finishes. At left is Sales Director Victor Duffill, well known throughout the world as a most knowledgeable authority on the company products. Vic tested De.H.Mosquitoes off the production line and so also understands the wants of aeromodellers. At right is Sam Sharp, Technical Director and Chief Chemist responsible for the exclusive formulae which have established Humbrol's high reputation.

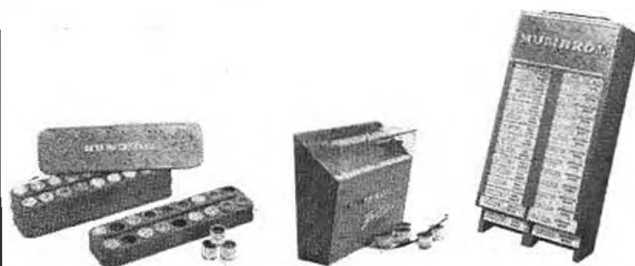


It is fascinating to see the Aerosol production line at work and to observe the care which is taken to ensure the highest standard of product. First the empty can is twice purged with jets of propellant gas to ensure that no air remains in the tin. Two china clay balls of unequal size are placed in the tin to ensure the best mixing when the can is shaken. Quickly the product is added, together with the propellant gas and the can is crimp sealed. It is then weighed, stringently leak tested, code stamped, labelled and packed complete with a tamper-proof shield to prevent wastage before sale. Thus the housewife can be sure that the Humbrol spray she buys for that little job about the home is in the first-class condition that

modellers have come to expect from the many Humbrol products which they have used for years.

The future seems limitless for this successful private company. With exports climbing at an almost astronomical rate, with their products known to every modeller in Britain (and much of the rest of the world, too), and with a large and growing share of the Do It Yourself markets, it is certain that the next fifty years of the company's history will be as exciting as the first half century.

We support Humbrol Ltd., with the Best in Point of Sale, Dispensers, etc.



... which we like to think has helped considerably in their undoubted success.

We heartily congratulate them on their 50th anniversary as a Company and look forward to our next 50 years of association.

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topical twists

by 'Pylonius':
illustrated by 'Sherry'

Some mothers 'ave 'em

Whenever I have sat down at the kitchen table with a handful of drawing pins I get just a wee bit self-conscious about being a member of an Engineering Society. I know that when the S.M.A.E. opened up in business back in the days when even kites were looked upon as a chinese novelty the stalwarts who ventured forth on Wimbledon Common would inevitably leave behind a hot lathe and several burned out soldering irons; so how could the engineers suspect that a pukka flying machine could be 'engineered' out of a razor blade and a pair of pliers? Perhaps if any prophecy had been made at this time it wouldn't have been of kitchen table engineering, but rather the gloomier one of model planes for the masses being turned out on the production line at five bob a time.

Oddly enough, though, the manufacturers of things that go bump in the park have never seriously got down to the production of a flyable model plane. I doubt if the most expensive ready-made model has the performance of an untrimmed chuck glider. One reason for this is that the toy department designers treat model planes on the same terms as cars, trains and boats, with the result that you get a model plane shaped like a boat, as heavy as a train and with the airborne performance of a car. Another reason is that some model plane makers still have a complex about that 1920 heavier-than-air machine, determined to get that design flying, come what may. I picked up the latest plastic variation on a stall the other day. Alas, the elastic band motor just could not levitate the 20 in. span, 4 oz. nose-heavy model. If only the designer had left the toy basement to have a look around the local flying field...

Coming back, however, to the engineering content of the hobby, gone are those carefree days when every modeller carried the Wakefield Cup in his knapsack. You need something more than a kitchen table and razor blade to win even a place in a club comp. these days. Take radio, for instance, and I except those models which look as if they have been made out of the kitchen table. You are looked upon as the rawest beginner if you use balsa for anything other than packing around the equipment. In fact, you need something more than 'Engineering', if by this you are thinking of the usual lathe and drilling machine operations. You are now required to set up a series of private manufacturing plants in order to exploit all the new materials which are flooding into the hobby - I mean industry. Anything but a moulded glass-fibre fuselage and a polystyrene-cored wing is strictly for the Vintage event. And as for balsa and fabric wings - well, if you want to lark about...

Just hold on a moment while I clear this kitchen table. The bits of tissue keep getting into the type-writer.



'That's nothing. Wait till he gets his radio working!'

See through

Whilst the covering on certain types of model is becoming increasingly flimsy, the flying type model seems to be acquiring more robust forms of outer casing. The old tissue and dope application is being rejected in favour of various forms of plastic sheeting. Sheathed thus in shiny array, they present a glossier aspect to the eye of the beholder; though not all are impressed by this skin deep form of beauty.

Perhaps more beguiling is the very latest in see-through coverings. All the enticing innards are daringly revealed in a sort of 1/8 in. square balsa strip-tease.

Self centred

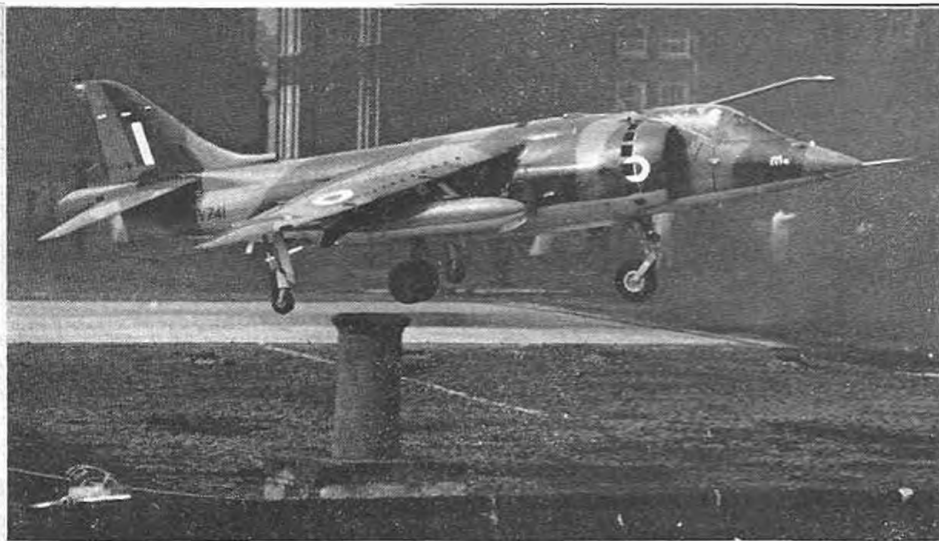
Someone has made the point that the negligent model flyer is only negligent of other people's safety, never his own. That untrimmed or out of control model might cause a few heart transplants, from body to mouth, but never occasions a rapid sidestep or sudden horizontal posture on the part of the model flyer himself, whose only concern is the amount of damage the human anatomy can inflict upon his precious model. Motor cyclists, car drivers, aircraft pilots and most other forms of missile guiders put themselves at the highest risk, although that doesn't seem to deter some of them, if what goes on at our local roundabout is anything to go by, but this personal involvement element does put the model flyer in a rather special category.

Some people seem to think that the answer to negligent flying is a hefty dose of insurance cover. This is very good publicity for the model flying image, no doubt, and jolly good, too, for the insurance business, but it could be taken by the negligent flyer as licence to become even more negligent. After all, anyone who launches an untrimmed power job in the car park, or does a buzz bomb sortie over the picnic parties, couldn't have much more than balsa packing between the ears. And just think how much all those thousands of pounds of insurance could bolster up his already large-scale ego.

My idea of dealing with the danger man is by a booing campaign. Whenever anyone flies to the public (or other model flyers) danger, particularly the show-off, he should be subjected to catcalls and booing by all other model flyers present. One good boo is worth a hundred pounds-worth of insurance cover.

Penny for them

With all those flying lavatory doors we have been seeing of late, are we to expect a special 'Ladies' event?



Aircraft Described No 185

HAWKER SIDDELEY HARRIER

Drawn by P. Lloyd

THE EXTREMELY successful City to City operation of the Harrier in the *Daily Mail* Air Race to commemorate Alcock and Brown's first non-stop crossing in 1919, captured the public imagination and convinced the sceptics that V/STOL was here to stay. By winning the race with a fastest East-West time between the G.P.O. Tower in London and the Empire State Building in New York, the Royal Air Force attained a unique leadership.

The Hawker Siddeley Harrier GR MK1 is the world's first fixed wing, vertical or short take-off close support aircraft. Its development can be traced back to the original decision to proceed with the first P1127 (Kestrel) ten years ago. From the first hover at Dunsfold on October 21st 1960, and transitional flights in September 1961, progress toward the Harrier of today has been a story of triumph over adversity.

Though extremely similar, there is very little which is common to both Kestrel and Harrier. The technique of employing vertical thrust as originally conceived by the French engineer, Michael Wibault, was the vital link between the evaluation of the Kestrel and design of its more powerful successor.

First flown on August 31st 1966, the Harrier had a 19,000 lb. thrust Pegasus 6 engine compared with the 11,000 lb. s.t. of its predecessor and whereas the first ever flight was so marginal that it permitted only two minutes of hovering flight because of the thrust/weight ratio, the recent transatlantic flights have clearly demonstrated the Harrier's capacity to meet all situations. It can climb to 10,000 ft. in under 40 seconds, reach Mach 1.25 in a shallow dive, has a ferry range of 2,000 miles and can carry an external load of 5,000 lb. on three fuselage and four under-



Lift-off at Somers Town Coal depot, St. Pancras Station in London, and arrival at the Bristol Basin a mile from the Empire State Building in New York provide significant photos of a remarkable achievement well within the capacity of the Harrier. At left, the load bearing outrigger wheel, and elephantine intakes (blanked off here while parked) details which distinguish the unconventional Harrier.

wing armament support points. Combination of weapons includes two 30mm cannon in detachable pods, retarded fall bombs, rocket packs or missiles. One special reconnaissance pod contains five cameras, and for ferrying, the wing pylons can carry overload tanks to supplement the 650 gallon internal fuel.

Critics of the vectored thrust V/STOL principle have argued that the penalty of having to carry fuel for lift off and the vulnerability of operational bases close to any target area outweigh the claimed advantages, but Hawker-Siddeley have proved otherwise. The Harrier is essentially a close support aircraft of high subsonic performance. It can operate from any rough patch 200-300 yards long where ground roll is





needed or from a helicopter size pad when its unique VTO is required. It can and has, also operated from the decks of naval vessels ranging from large carriers to heavy destroyers. Rapid take off and transition which has been so ably demonstrated at the air shows and its relative immunity from the hazards of cross-wind conditions, runway damage, ice, snow or water covered place the Harrier in a far safer position than its conventional equivalents. One enormous advantage it holds is the capacity to decelerate rapidly to speeds of less than 100 kts, when the nozzles are deflected for steep angles of descent.

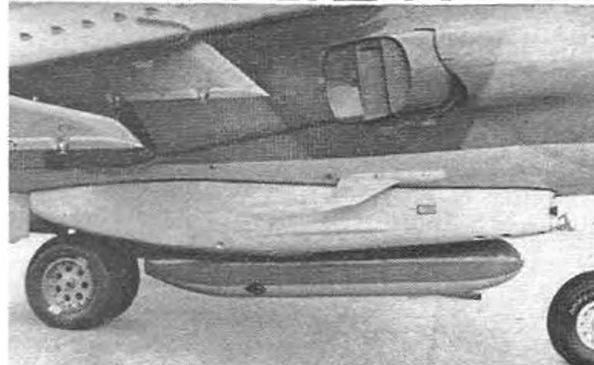
Here are the real values of vertical thrust. The Pegasus is a two-spool turbo fan. At the front, and clearly visible in the large intakes of the Harrier are a pair of co-axial (to avoid complications of torque reaction) low pressure compressors. This ducted fan, driven by the shaft from the turbine at the rear supplies cold air to port and starboard nozzles at the front of the fuselage. Part of its air supply passes aft to the high pressure compressor and combustion chamber, thence to the turbine. From there, the exhaust gases exit through the rear bifurcated pipe to port and starboard nozzles. All four nozzles are interconnected and controlled from a single lever in the cockpit in a most simple manner. Air bleed from the engine is diverted to reaction controls at nose, tail and wing tips.

A Martin-Baker 'zero-zero' rocket ejection seat, Ferranti navigation attack system with moving map display, and for the first time in a British military aircraft, projection of primary flight info on the screen are features of what is actually a very simple, uncluttered cockpit.

Most recent development has been the two-seat (T-2) variant for training or diversified operation. Extension of the nose with compensating increase of the tail boom leads to quite a change of side profile. The cockpit is now very much like that of the Douglas A-4F two-seat project with excellent forward visibility for both occupants.

With the G.R. Mark 1 in quantity production for the Royal Air Force and the first Squadron already commissioned at R.A.F. Wittering near Stamford, the future of the Harrier is very much assured for our own armed services. Many other nations have beaten a path towards Dunsfold in Surrey with a prospect of purchases. Israel, Japan, Denmark are frequently quoted as being 'extremely interested'. Examples of the earlier Kestrel bought under the Anglo German American tripartite evaluation scheme have been on test at bases in the U.S.A. for a long time and demonstrations of the two transatlantic Harriers following their flights to New York may possibly produce further interest amongst U.S. service chiefs.

Certainly the Harrier, with all its distinctions, is a more than adequate successor to the popular Hunter.



With refuelling probe fitted for the transatlantic race and two ferry tanks the Harrier rests close by the York Road Gas Works (!) top left. Sliding canopy and nose contours are clear in top right, while detail of the Aden Gun pack, tank and tubulators, plus bold stencilling are evident in close up views. Below, the Harrier hovers 'clean' without undercarriage extended. Only deflected nozzles and wing flaps indicate that the heavy airframe is, in fact, stationary.



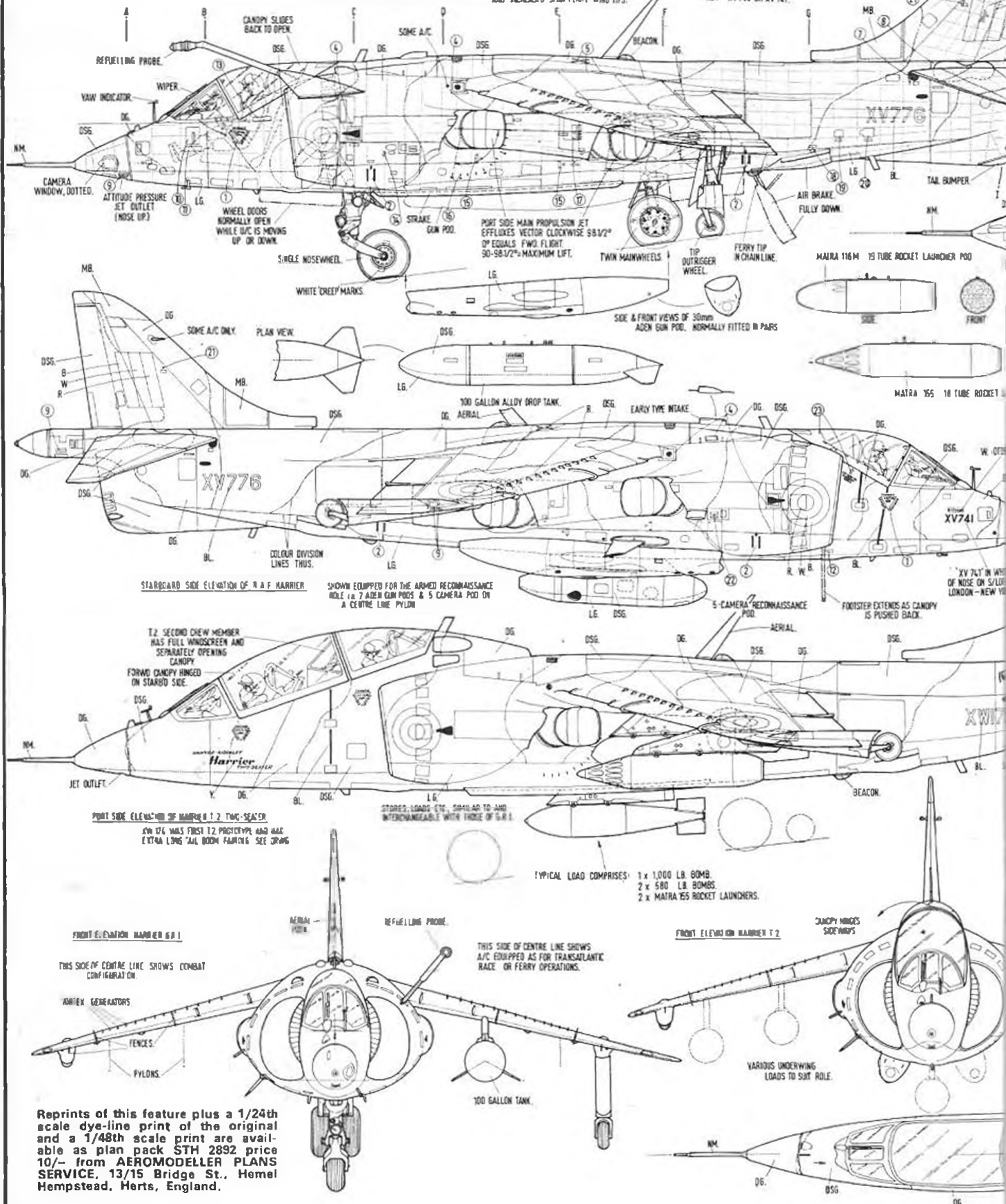
PORT SIDE ELEVATION OF TYPICAL R.A.F. HARRIER G.R.1

REFUELLING PROBE NOT STANDARD
ONLY FITTED AS REQUIRED FOR FERRY
DISTANCES, AND 49 R.A.F. OPERATIONS
'BLUE WILLOW' - THE TRANSATLANTIC AIR RACE

TWO HARRIER ENTRIES XV 741 LONDON - NEW YORK
XV 744 NEW YORK - LONDON
BOTH AIRCRAFT Fitted WITH REFUELLING PROBES,
2 100 GALLON DROP TANKS (HOBBS, PH. OMS.)
AND INCREASED SPAN FERRY WING TIPS.

BLADE AERIAL SOME A/C
NOT XV 744 OR XV 741.

R.A.S. WITTING CONVERSION UNIT BASE
BOTH SIDES OF FIN ON AIRCRAFT
SERIAL XV 744 FLOWN BY
S/LHR WILLIAMS.



PORT SIDE ELEVATION OF HARRIER T.2 TWO-SEATER
XV 124 WAS FIRST T.2 PROTOTYPE AND WAS
EXTRA LONG 'TAIL' BOMB FIGHTING SEE DRAWING

SHOWN EQUIPPED FOR THE ARMED RECONNAISSANCE
ROLE (a 7 AERIAL GUN PODS & 5 CAMERA POD ON
A CENTRE LINE PYLON)

TYPICAL LOAD COMPRISES:
1 x 1,000 LB BOMB
2 x 500 LB BOMBS
2 x MATRA 155 ROCKET LAUNCHERS.

THIS SIDE OF CENTRE LINE SHOWS
A/C EQUIPPED AS FOR TRANSATLANTIC
RACE OR FERRY OPERATIONS.

FRONT ELEVATION HARRIER T.2

CANOPY HINGES
SIDEWAYS

VARIOUS UNDERWING
LOADS TO SUIT ROLE.

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FREE FLIGHT COMMENT

by John O'Donnell

THERE IS USUALLY a lull in the contest season immediately following the 'Nationals'. Whether this is due to reaction on the part of both organisers and participants – or to their need to spend a week-end with their families could be debatable! This year is no exception – but it does enable me to devote my 'comments' to items of a more general nature than straightforward contest reports.

Newcomers who attended the Nationals may well have been surprised at the absence of any form of prizegiving. Whilst such a ceremony is usually the finale of most competitive activities in other sports, it is often a disappointment at aeromodelling events. Often the situation is complicated by the free-flight winners still being involved in retrieving their models. Certainly 'Nationals' prizegivings have not been over-successful in the past.

This year, however, there was another consideration involved. There was, in effect, nothing to award to the winners! Trophies are traditionally presented at the annual S.M.A.E. Dinner. Souvenir engraved plaques are also distributed at that time. In the past there have been monetary awards for the major centralised events. For this year these have been withdrawn.

It may be thought that prizes are a poor reason for competing, and that participants should strive for success more or less for the love of the game. There is little need for argument. Aeromodellers have had little option during the period I have been taking part in competitions. Most meetings offer prizes that even if won, are insufficient to cover the cost of attending the event. There have been exceptions, remember the 'Jetex' events sponsored by Wilmot Mansour? – but they are few and far between.

Over the years there has been a noticeable tendency for the smaller galas to award cash prizes – almost invariably being merely a redistribution of the entry fees. This is not very satisfactory as participation varies so much with the weather and other factors. The result can be an embarrassing situation for all concerned, especially where winners receive back little more than their entry fees! Many clubs claim that they cannot afford to run events at a loss as they have little or no capital available. This has obvious repercussions, particularly that of creating the impression that the event does not really matter to the organisers.

Some of the drawbacks seem to be apparent to all. There is reduced participation and interest, and the whole situation starts to 'exhale' (or is it de-escalate?) Fortunately there are some signs of positive thinking now starting to appear. To try to encourage fliers, the N.W. Area have resurrected the idea of a *guaranteed* first prize in the 'additional' events staged at area-centralised events. This is a relatively modest amount – but it is paid out *regardless* of the number of entries or the scores returned. This scheme comes into its own by providing some inducement for flying in unfavourable conditions. Certainly interest this year has been much better than last. Even though good weather may have helped, the N.W. feel very satisfied with the experiment.

Elsewhere there is the view that permanent awards, such as plaques, are preferable to cash prizes of the size that are practical. Such is not to everyone's taste, and the Northern Area has found a democratic solution. Winners are offered a choice of plaque, cash, or a voucher for modelling goods. It is interesting that 'new names' generally prefer the plaques, whilst the 'old hands' do not. There is no doubt that a person's first cup or trophy is a great thrill – a factor soon forgotten by those in the game for too long! It is equally true that the effect 'tends to a limit' (to borrow a mathematical term) and that alternatives are required.

There is little danger that the contest flier can become mercenary in his outlook. *Anyone* who attends meetings regularly does a fair amount of travelling and spends a lot of money on his hobby. Certainly the attitude and general spirit of competitors would change if there was the 'big money' involved that is characteristic of other sports.

★ ★ ★

Another interesting feature of the British Free-Flight scene is the absence of National records. This is always somewhat of a surprise to the uninitiated, who, naturally enough, expect to find a corresponding parallel to the fastest, furthest, highest figures characteristic of other activities.

There *used* to be British records for the *longest* flight recorded in a wide range of categories. Once models had progressed to the stage of thermal flying, single flight records had little meaning. The records for the conventional categories rapidly climbed to the sort of scores that were only likely to be matched by D/T-less flyaways. At this point no-one was interested any more. Even the unorthodox classes, where flight of any form was an achievement, could suffer the same way. I can remember Norman Marcus's rubber driven flying scale record (5.30) that looked likely to stand for ever!

Another aspect was the continued change in competition rules, a situation not reflected in the then current records, some of which survived changes in towline length, R.O.G. requirements, etc. There was some attempt made to separate F.A.I. and lightweight models – but that effectively doubled the corresponding number of records. It *did* enable my club to 'put itself on the map' by dint of holding a considerable number of these records at one stage. It proved a very good outlet for models unsuitable for contests – as they could be treated as expendable and flown on calm thermally days. I had a modified (but scarcely improved) version of the *Raft V* that was useless for contest purposes – but that once held simultaneously the British lightweight rubber monoplane, biplane and seaplane records!

30 year contrast in Wakfields! Bob Copland with his famous GB3 which he took to New York in 1939 to place 4th (Plan of similar model still available as D121X price 6/6d. from A.P.S.) and at left, Tom Chambers with winning 1969 model at Northern Area Topcliffe meeting, 15th June.



Attempts to rationalise the 1/1 records on a year to year basis culminated in the decision that they meant so little that they could be discarded. There was no outcry, and the situation has continued unchanged until the present time.

Elsewhere things are different! In particular anyone who reads the American magazines will realise that their National records carry prestige – and are usually regarded much more highly than merely winning a contest. The Americans solved many difficulties by dropping the single flight concept and having their records based on their normal contest rules. Most current records consequently consist of the appropriate number of consecutive max's (3 for A.M.A. events 7 for F.A.I.) followed by one or more fly-offs.

Changes in contest rules, model specifications and the like are catered for in a simple, if ruthless, manner. Existing records are scrapped and new submissions invited. It all seems to make for plenty of interest, even if record-breaking becomes something of an endurance test in more ways than one.

Some of this may have been apparent from last month's mention in 'Hangar Doors' of a couple of astronomical sounding scores. These were 68.54 by George Batuik in unlimited rubber and 94.19 by Lee Polansky in Class A Gas. Translated these mean that both did three 5 min. max's followed by successive progressive max's (6, 7, etc.) until George dropped to 2.54 trying for 12 minutes, and Lee to 3.19 trying for 14! That such scores are dependent primarily on the weather is amply proved by George's story in the N.F.F.S. 'Free Flight' newsletter. It was just a case of wind-up and launch – without 'any attempts to pick air' – until the lift went. It is significant that both the quoted records were being made simultaneously at the same venue. Equally interesting was an earlier account by Lee Polansky describing his previous record. The biggest difficulty he had was in persuading timekeepers to remain after the contest closed until he finished at about 3 p.m. Most of their contests seem to start very early (7 a.m. is typical) in the morning and finish early (noon to 2 p.m.) – presumably to enable long distance participants to drive home in reasonable comfort. A very practical concept I might add!

Recent conversations with my club members have highlighted certain common constructional difficulties. The most universal of these is the satisfactory execution of dihedral breaks. This point is usually dismissed in a couple of sentences (at most) in most sets of building instructions in the style of 'cut wing into panels, trim ends to correct angles, join at specified dihedral'. It is the central step that gives everyone trouble.

In principle, all that is necessary is to block up the panel (at the appropriate dihedral angle) so that the joint-line comes right at the edge of one's building board or table – and simply sand off the excess material from L.E. TE and spars. In practice, it is quite another story. Positioning a structure in such a fashion and so that it does not move at the critical moment is difficult. Most people usually hand-hold components. Then different size and grade members sand differently.

Norman Lees and Len Stott with famous 'Flying Minutes' streamliners which they took to the U.S.A. in 1939, placing 5th and 7th respectively – see pages 408 to 410 for more details.

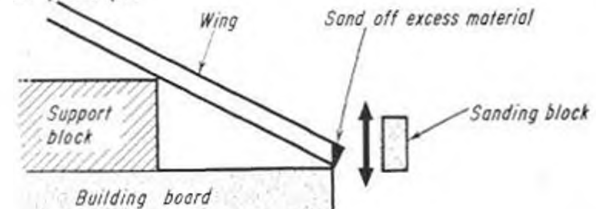
The builder is then reduced to attempting corrective measures to either one or more of the spar (or edge) ends. The resultant process is rather reminiscent of the proverbial story of stopping a table from rocking by cutting pieces off the legs! It is little wonder that the usual results include gaps filled with cement and/or tips that sweep forward or back.

There have been a number of different solutions advocated to this general problem. Kalkraft, for example, kitted several Bill Dean designs in which the main spar was built first, complete with polyhedral. The wing was then built one panel at a time, so that the required dihedral was automatically incorporated. The main drawback to this system is that the spar must be fitted vertically relative to the building board – as deviations from this has undesirable results.

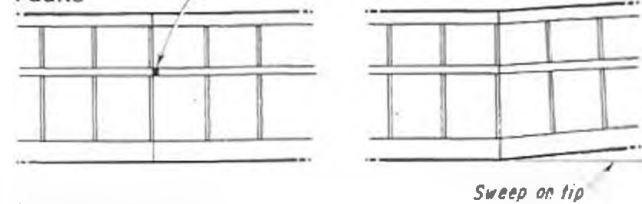
The best system I have come across is to build the wing in one piece if possible (or two in the case of A/2's) and to omit the spars in the tip panels. The 'sparless' tip is then fitted at the required dihedral. With only L.E. and T.E. to chamfer and fit, obtaining a good joint is relatively easy. After the joint has dried out, the spars can be fitted one at a time. Again with only one end to fit, there is little difficulty. Dihedral keepers, gussets or gauze can then be added to taste!

It's not often that the easy answer is also the best – but this technique is strongly recommended.

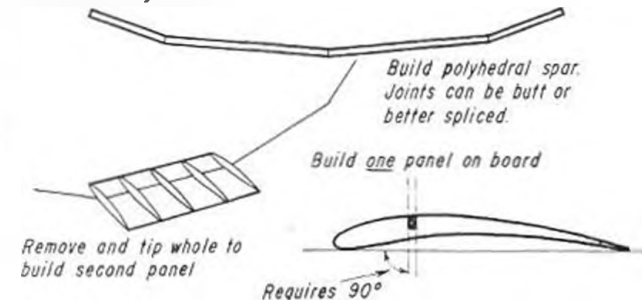
In principle



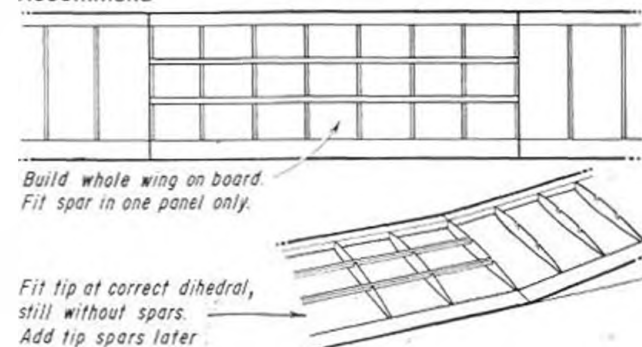
Faults



Bill Dean system



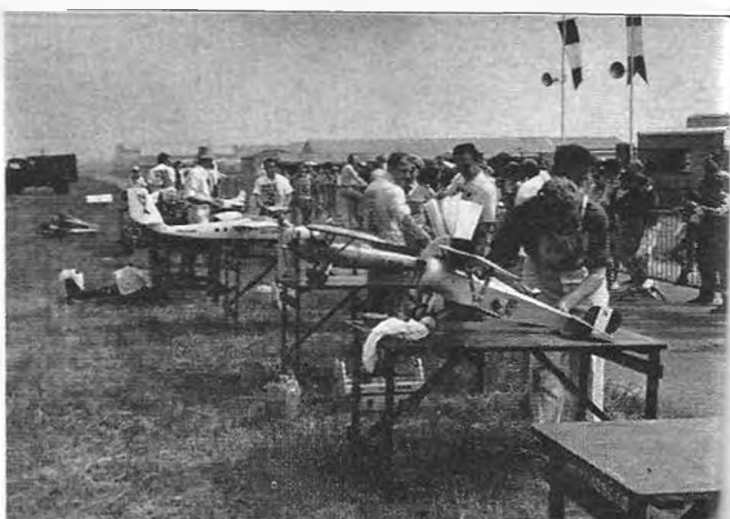
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METZ FRESCATY

1st CHALLENGE INTERNATIONAL DU GRAOUILLY

DE MAQUETTES VOLANTES TELECOMMANDEES



BRITISH SCALE MODELLERS TAKE 6 OF FIRST 9 PLACES IN FRENCH INTERNATIONAL ——— reported by Dennis Thumpston

THE FRENCH CLUB 'Le Graouilly', the aeromodeling section of *Les Ailes Mosellanes*, pioneered international R/C Scale competition flying when, on June 14 and 15, they held the 'Challenge du Graouilly' at Metz-Frescaty aerodrome, just a few miles from the historic city of Metz. FAI rules were in force, and club president Pierre Koppe, ably supported by M. Reggiori and his committee, was obviously determined to make this first international R/C scale event an occasion to remember. Apart from the social side, the facilities provided were absolutely first-class and the prizes of F.1,500, F.1,000 and F.500 for the first three places must surely have set a new high.

The entry was initially 19, but of these five were unfortunately withdrawn at the last moment, and there was a danger that a further three would not be able to compete when the models of Roy Scott, Peter Neate and Robin Lehman were impounded at customs. Such was the determination and co-operation of the organisers that they went to tremendous lengths in order to get these models released, enlisting the aid of no less a personage than the Minister of Defence, so that ultimately a French Army transport aircraft was laid on to fly the models down to Metz, to the great relief of the frustrated competitors.

It was decided that each model should be static judged before it was flown, the international trio of judges consisting of S. Zwahlen of France, F. Fosch of Germany and D. Thumpston of Great Britain. All models were weighed and dimensions checked with the aid of an electronic calculator which had been provided. Lack of provision of adequate documentation, or no clear statement of scale is a common failing among scale entrants, and there were the usual instances on this occasion, with the result that two of the models, Bruno Klupp's *Great Lakes* biplane and Frantz Lallemand's *Nord Aviation* observation plane, received only token scale points. The judges were particularly impressed by Roy Yates' provision of a two-scale rule which enabled any measurement to be instantly checked from the 3-view drawing to his model, thus considerably simplifying their task.

The standard of the British entry was quite high, and at the completion of static judging, Roy Yates' *Percival Provost* and Norman Butcher's *Fokker Dr.I* were well ahead of the rest of the field, with Germany's Walter Reger in third position with his beautifully finished, though slightly inaccurate *Stafford Kit Piper Comanche*, closely followed by Roy Scott's *Spitfire Vb* and Robin Lehman's (U.S.A.) *Sopwith Triplane*. Best of the French entries was by Pierre Marrot, seven times French aerobatic champion, whose *Fairchild P.T.19* stood at sixth position scale-wise, and Jean Schaefer's *Douglas Skyraider* at 9th.

Ken Marsh was drawn first to fly but his colourful spatted *Curtiss Hawk P6e* failed to get airborne and he had to call an attempt. Ken was the first of several of the British competitors to hit this trouble—the very high temperature was having an adverse effect on silenced engines with a resultant loss of power, and with no wind to assist the take-off, models were running off the 50 m. tarmac circle and into the fairly coarse grass stubble without getting airborne. Given a longer run, all would have been well, and plans are, in fact, in hand to enlarge the tarmac area.

Bruno Klupp's lightly loaded *Great Lakes* biplane lifted off easily and flew beautifully with great precision, followed by Manfred Gerard, also from Germany, with his *Lockheed P.38 Lightning*. This model had scored only low marks for scale and workmanship, but it was certainly impressive in the air. The two S.T.35's were started within seconds and the twin-boomed model was soon putting on a most impressive display, and in particular, the novel method of spinning created quite a talking point. Independent throttle controls enabled Manfred to initiate the spin simply by closing one throttle, and to effect recovery, it was only necessary to open up again. Jean-Paul Becht of France flew next with his *Junkers Ju87b*, another model which had not scored well scale-wise, but his flying was of a very high order, the touch and go being perfectly timed.

Frantz Lallemand had to withdraw with engine



M. Gerard with Lockheed P.38 showing one rudder adrift. Jean Schaefer and his Douglas Skyraider, and French aerobatic champion Pierre Marrot with Fairchild P.T.19. Hot weather and cloudless skies add to a magnificent meeting.



Left, Line-up of Models at flight line with P. Neate's Nieuport 17 in foreground.

Right top to bottom: Judges at work on K. Marsh's P-6e and N. J. Butcher's Fokker D.R.1 in foreground. Next is Jean-Paul Becht's Junkers Ju87, Sid Sutherland's Gloster Gladiator, Francois Ghislain's Morane 315 and at bottom Walter Reger starts his Piper Comanche.

trouble, and Sid Sutherland with his *Gloster Gladiator* also had to call an attempt for the same reason, but Norman Butcher, after swinging badly on take-off, again due to lack of power, flew his *Fokker triplane* confidently, if a little jerkily, to achieve what transpired to be the second best flight of the day. The highest flight score of the day, indeed, of the meeting, was made by the next competitor, Germany's Walter Reger, whose *Piper Comanche*, with flaps and retractable undercarriage, flew with great precision, if a little fast.

Roy Yates flew his well-known *Percival Provost* in masterly fashion and looked set fair to build up a commanding lead, when fate took a hand. The *Provost* was rather slow going into the spin, the last of Roy's nominated manoeuvres, and although he did the three requisite turns he was unable to recover in time and the model spun in, sustaining considerable damage. Nevertheless, his flight score was not far behind the leaders and he was still well in the running in view of his high scale marks. Pierre Marrot was another to suffer with engine trouble and his *Fairchild P.T.19*, although it made a qualifying flight, was in trouble throughout. However, Ken Marsh, taking his second attempt, made a grand flight with his *Curtiss Hawk* which was to put him third in first round flight points, whilst fellow club-mate Sid Sutherland also put his *Gladiator* realistically through its paces on his second attempt to build up a respectable score. Last flight of the day was made by Francois Ghislain, who had the misfortune to crash just after take-off, but in true tradition, he worked through much of the night repairing his *Morane 315* in readiness for the second round next day.

Sunday dawned sunny, hot and calm, and flying resumed with the remainder of the first round flights, but both Peter Neate's *Nieuport 17* and Roy Scott's *Spitfire Vb* were afflicted by the same lack of power which had troubled many models on the previous day, and only nominal scores were recorded. Last of the first rounders was Robin Lehman, flying under USA colours, and having given the *Sopwith Triplane* an early morning workout, he did not anticipate any problems. However, the motor jinx struck again and he had to forfeit his first flight—a pit check later revealing that the cylinder-head bolts had worked loose.

Second round flights then commenced, the same flying order being used, and although some of the British models again suffered from loss of power, all competitors except Sid Sutherland and, of course, Roy Yates, were able to make a second flight, with several improving their scores. Klupp's *Great Lakes* again flew well and put up the highest second round score—he is one of Germany's team to fly in the forthcoming international R/C Scale event at Bremen, where he will be flying a *Fokker DVII* which, unlike his *Great Lakes*, will be fully documented, so he should do well. Gerard's *P.38* (from a Royal kit) again impressed, although he narrowly avoided disaster when one of his twin rudders came adrift in flight. Norman Butcher, after an abortive take-off attempt, when it was discovered that the ground-loop was caused by his assistant's rather large foot being placed firmly on the triplane's trailing aerial, flew considerably better to improve on his first round

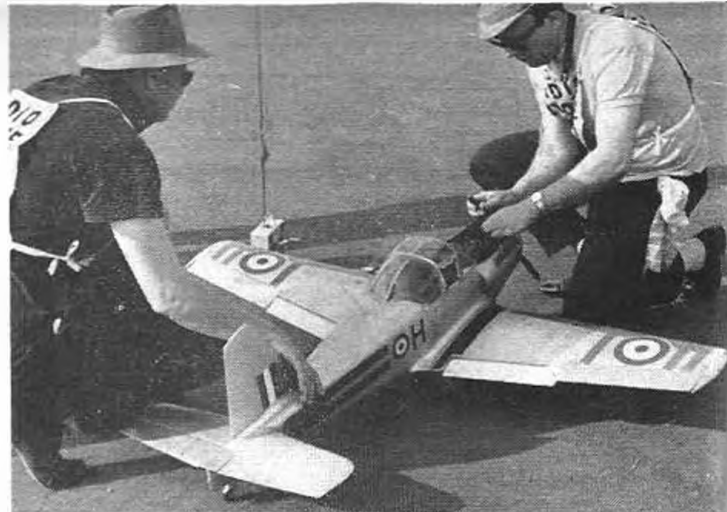


score. His use of throttle during aerobatic manoeuvres was particularly good, and, in fact, one of the outstanding features of this meeting was the intelligent use of throttle, especially by the German and French flyers, who used power as on the full-size aircraft, throttling back after take-off in order to achieve a near-scale speed whilst cruising, and only opening up as required for aerobatic, overshoot or touch and go. This is one department where many of our scale flyers could possibly learn from our continental friends.

Both Neate and Scott scored well on their second round flights, the *Spitfire* being especially popular with the spectators. For France, Schaefer improved considerably on his first round flight, whilst Becht made the second highest score of the day with the confident way in which he handled his *Stuka*. Marrot was again unfortunate when his motor cut early whilst flying his *P.T.19*, but Ghislain was rewarded when, after his all-night repair session, he made an impressive flight with his *Morane 315*, a pretty parasol design. Lehman's second flight, although only a hop, because of a holed fuel tube, was sufficient to qualify and, the competition over, he promptly proceeded to demonstrate how it *should* have flown when he put the large *Sopwith Triplane* through its paces in fine style and at a really scale speed.

When the flight scores had been computed in accordance with the current FAI formula, the results showed that Roy Yates had scored enough before his crash to make him a deserved and popular winner, with Norman Butcher not far behind to take second place with the *Fokker Dr.I*, and Walter Reger in third position with his *Comanche*. The British entries acquitted themselves well, taking three of the first four places, for Roy Scott's *Spitfire* was fourth, but there is no room for complacency—the flying standards of the French and German competitors were both high and consistent, and an improvement in their scale accuracy and workmanship would make them tough opposition indeed.

The organising club had indeed worked hard in order to make the meeting a success and a number of ideas which they put into operation are worth recording. A microphone and amplifier were provided at the flying circle in order that the competitor's assistant could call out the manoeuvres to the three flying judges who were able to remain seated just outside the circle and carry out their work in comfort, without causing congestion in the take-off and landing area. Good workshop facilities were on hand for



Winner Roy Yates starting his O.S. 60H in Percival Provost.

emergency repairs, and these were utilised by more than one flyer, and last but not least, a carbon copy of each score sheet was presented to each competitor after the event.

At the prizegiving—and in addition to the large cash awards for the first three places there were cups for most of the competitors—all contestants and judges were presented with a memento of the occasion, whilst Roy Yates received a magnificent porcelain replica of 'Le Graouilly' (pronounced 'Growlly'), the fabled Metz dragon of the Moselle which the club has adopted as its badge. The friendship and hospitality extended to all, and the good fellowship enjoyed at the closing banquet when five spit-roasted sheep and barrels of wine were on the menu (!) will long be remembered by all who were privileged to be there.



The static judges examine K. Marsh's Curtiss Hawk.

Scores below are TOTALS NOT AVERAGES

Pos.	Name	Nation	Aircraft	Engine	Equipment	Scale	Work-man ship	Total	Flight 1	Flight 2	Corr'd Flight Points	Total
1.	Roy Yates	G.B.	Percival Provost	OS 60H	RCS Digi 5	704	584	1,288	1,164	—	1,093	2,381
2.	N. Butcher	G.B.	Fokker Triplane	Merco 61	RCS Digi 4	550	480	1,030	1,467	1,654	1,212	2,242
3.	Walter Reger	G	Piper Comanche	S.T. 56	Micro Prop	453	440	893	1,923	1,581	1,161	2,054
4.	Roy Scott	G.B.	Spitfire Vb	Merco 61	Logictrol	411	472	889	105	1,412	785	1,674
5.	J. Schaefer	F	Skyraider	S.T. 60	Simprop	394	306	700	1,293	1,579	829	1,526
6.	Peter Neate	G.B.	Nieuport 17	OS 60F	Staveley	420	342	762	20	958	536	1,298
7.	P. Marrot	F	Ryan P.T.19	S.T. 60	Radio Pilote	427	363	790	290	891	507	1,297
8.	S. Sutherland	G.B.	Gladiator	Merco 61	Kraft	412	312	724	565	—	310	1,034
9.	Ken Marsh	G.B.	Curtiss Hawk	Merco 61	Kraft	270	277	547	1,302	667	469	1,016
10.	J. P. Becht	F	Junkers 87B	S.T. 60	Simprop	251	193	444	1,021	1,658	555	999
11.	R. Lehman	U.S.A	Sopwith	Merco 61	Logictrol	453	405	858	—	—	—	858
12.	Manfred Gerard	G	Lockheed P.38	Two S.T. 35's	Kraft	184	132	316	1,232	1,576	386	702
13.	F. Ghislain	F	Morane 315	S.T. 56	—	194	168	363	80	1,114	289	651
14.	Bruno Klupp	G	Great Lakes	S.T. 56	Micro Prop	64	226	290	1,037	1,719	146	436
15.	Frantz Lallemant	F	Nord Aviation Observation	S.T.56	Multiplex	—	—	—	—	—	—	—



Are you between 10 and 16 years of age? Then don't delay, join today

Dear John,

I have been a Golden Wings member since February, and this is my first letter to you. I have recently completed the Mercury 'Matador', with R.C.S. single-channel radio and A.M. 10 power, which I thought may have been not quite powerful enough, but proved to be sufficient.

After nylon covering, a warp developed in the port wing, and, after heat treatment, the wash-in crept back. As I was under the 30 oz. recommended weight for 'Matador' with radio, I decided to coat the wings with un-thinned fuel-proofer, in the hope that the proofer would help in some way. When dry, and re-heated, the warp disappeared, and has not returned. Fuel-proofer has three uses on my 'Matador'. It resists fuel, removes warps and gives a pleasing gloss finish!

My 'Matador' first flew last Sunday, and due to the warp (this was before fuel-proofing) which had crept back in, and the tank being over-full, the model shot up into the air in tight spirals. We chased it in the car, but lost sight of it. When we got home a gentleman who had seen it land had returned it. I only wish that there were more public-spirited people.

I am glad that I remembered one of the Golden Rules with 'Matador' - ALWAYS put your name and address on your model!

Oadby, Leicester J. Clark.
Your choice of model and equipment is ideal for the beginner to single channel R/C.

If a warp develops in a wing, it should be removed as soon as possible before the dope fully hardens. I expect that the reason why your first attempts failed was due to a time lag before attempting removal of the warp. However, when you fuel-proofed the wing, this would have temporarily slackened the nylon, thus permitting warp removal before the proofer fully hardened.

Although dope or fuel proofer may feel dry after a few hours, it in fact does not finally harden for several days.

TIP OF THE MONTH

Dear John,

I have just built and flown the Hawk as from the plan in June Aeromodeller. As it came out rather tail heavy I hit on the idea of making the necessary ballast in the form of a second (dummy) cylinder. The engine installed was an old Wen Mac .049 and as I had a second scrap engine for spares I sawed off the crankcase flush with the bearers, removing crankshafts, piston, rear cover, etc., and filled the cylinder with molten lead, sealing the exhaust ports with copper wire twisted round between the fins. This half engine was then bolted on the opposite side of the fuselage using the same bolts that hold in the actual engine, thus giving a very neat horizontally opposed 'twin' needing quite a close look to tell that it isn't the genuine article. This brought the C of G exactly where indicated on the plan. Despite the extra weight my Hawk goes up like a lift, actually climbing so high on its first flight that it was invisible in clear air until the engine cut and the model glided down into view again, landing about a mile from the launch area. Thanks for another wonderful free plan.
Stoke on Trent. James Gough.

Dear John,

Please could you send me a copy of the rules and regulations for the following classes:

- 1) Wakefield
- 2) Coupe D'Hiver
- 3) A/1 Glider
- 4) A/2 Glider

Egham, Surrey.

C. Britcher.

Full details of all the rules for the various categories which you list may be found in the S.M.A.E. handbook, price 7s. 6d., or free to all full members of the Society.

If you wish to purchase a copy, or to have further details of our national body, I suggest you write to S. B. Lawton, Esq., Sec./Treasurer, Soc. of Model Aeronautical Engineers, 53 Blake-low Road, Macclesfield, Cheshire.

Dear John,

In the plans given away in the October '68 A/M for the 'Pup', the plans show the engine inverted, while in the photo on page 309 of the June edition the 'Pup' appears to have the engine mounted sideways.

Please could you tell me if this is a standard modification, as it might make things a lot easier, as I am thinking about building the 'Pup'. Thanks.
Farnborough, Hants. John Jackson.

You certainly have sharp eyes! You are quite correct in saying that the original model had a sidewinder engine - this being due to the fact that the builder used a Cox Golden Bee .049 cu. in. motor, which features a radial mount. Due to this, he was able to mount the engine at any angle.

However, because the majority of small engines available here are beam mounted, the plan was drawn accordingly.

If you have a radially mounted engine, omit the holes in formers F2 and 3, and bolt the engine to former F2.

Dear John,

I have an A.P.S. Satan, Quickie, K.K. Caprice, and I hope to be able to build Andy Crisp's Accipiter fairly soon. The Quickie has a one-piece wing attached to the cut-down fuselage by rubber bands, as I feel this is rather more shock-absorbing than the recommended method, especially in a dethermalised descent. The Satan has a balsa box nose section instead of the solid type but it is rather heavier than I would like (15 oz.) owing to excessive tissue and dope on the rear fuselage.

All three models have fuse D/T's but I am saving up for a timer. Please could you recommend a relatively cheap one (35s. approx.).

I have been using about 200 ft. of string as a towline but this is rather heavy. Could you tell me what is best to use? I have also tried terylene thread but I found it was too elastic and caused the model to unhook after take-off.

Portsmouth, Hants M. Floukes.
String is much too heavy to use with anything but an outside glider. I suggest you use nylon fishing line of about 10-20 lbs. breaking strain, as this is strong, light and not too elastic. For contest purposes you are permitted 164 feet, when subjected to an 11 lb. pull test.

Tatone and K.S.B. timers are reliable, light, and cost approximately 35-40s.

Dear John Bridge,

I am between 10 & 16 years of age and would like to become a member of the "Golden Wings Club". With this application I enclose postal order (International Money Order) for 2/6d. to cover cost of the enamel club badge, two coloured transfers and membership card.

NAME IN FULL
ADDRESS

YEAR OF BIRTH SCHOOL
NAME OF ANY OTHER CLUB OR CLUBS TO WHICH I BELONG (if any)

SEND TO:-GOLDEN WINGS CLUB, AEROMODELLER, 13-35, BRIDGE STREET, HEMEL HEMPSTEAD, HERTS

8/6p 2d. in the 1/- Rebate for Golden Wing Members
G.W. No.



THE HEART of this model is the crank and connecting rod system. The crank has been designed so that the lower wings are 90° out of phase with the upper wings. This means that when one set of wings is in its stationary position—i.e. highest or lowest point—the other pair of wings is still moving. Also, as the attachments of the con-rods with the wings are some distance apart, each pair of wings 'rocks' laterally. These two effects together produce a system in which only one wing stops at a time, or in other words, at least three wings are giving power at any instant.

The fuselage is a single flat framework $\frac{1}{8}$ " thick, built straight over the plan using $\frac{1}{8}$ " square hard balsa, with a small piece of $\frac{1}{8}$ " sheet at the tail end. Care must be taken to ensure that all the joints are well glued - P.V.A. being the best glue for this job - as the whole framework is subjected to considerable forces when the wings are flapping. When the fuselage has been removed from the plan a hole is drilled through the front piece to take the brass bush for the crank. The nose is then strengthened by gluing the small $\frac{1}{32}$ " balsa doublers to each side.

Flutter-By

The rear motor hook is bent from 20 SWG piano wire, pushed through the rear fuselage and the end turned over as shown in the plan. A coating of glue should be put on this 'tail-piece' to prevent it from cracking.

Finally, the pylon is covered on both sides with lightweight tissue, and can be doped, although this is not necessary.

The tailplane and fin are cut from $\frac{1}{32}$ " balsa. DO NOT DOPE and use the lightest grade of sheet.

The fin is glued directly on to the top of the tailplane, and the tailplane is glued directly on to the $\frac{1}{8}$ " square mount provided at the back of the fuselage.

The large negative angle of incidence is essential to keep the model pointing upwards, therefore pulling itself into the air. (As the wings are always moving, the model cannot stall.)

Four identical wings are made. The leading edge of each wing being made first. This L.E. is built up from three laminations of $\frac{1}{32}$ " x $\frac{3}{32}$ " balsa.

Fix pins into the modelling board along the line of the inside (rear) side of the L.E., and carefully bend the first strip round these pins, pinning it in place as you go, and using these to pin the two strips together. DO NOT PIN THROUGH THE WOOD!

The third strip is added to the front of the first two in a similar manner. P.V.A. is again the best glue to use. When the glue has completely dried, cut the ends of the L.E. to size and add the $\frac{3}{32}$ " square balsa wing root, and a generous $\frac{3}{32}$ " balsa gusset. The joint between the L.E. and wing root has to be strong and rigid, so do not make the gusset too small, and glue it in well.

When the wing has been removed from the plan,

Contest Calendar

July 19	CROYDON EVENING (Open) Chobham Common 6 p.m.
July 20	SOUTH BRISTOL SUMMER GALA F/F, Vintage, C/L, R/R & Combat R.A.F. Hullavington.
July 20	FLYING DRUIDS M.A.C.-2nd Multi Aerobatic event. Venue, Middle Wallop.
July 27	RICHMOND GALA ALL F.A.I. In rounds. No re-entry. Processing. Commencing 10 a.m. at Chobham Common.
August 3	HORNETS RALLY Scale and Spot landing at Pollock Rec. ground, Glasgow.
August 9/10	SOUTHEND R/C RALLY Leigh Marshes.
August 9/10	R.A.F.M.A.A. CHAMPIONSHIPS, R.A.F. Watton.
August 17	S.M.A.E. ALL SCALE MEETING R/C F/F, C/L, R.A.F. Little Rissington.
August 24	SUTTON COLDFIELD R/C RALLY for Multi Aerobatics. 10.30 a.m. start, Fradley, near Lichfield.
August 24	S. MIDLAND AREA Burns-Brown Combat Trophy open to all comers. 4/- pre entry to T. Healey, 22 Upper High Street, Harpole, Northamptonshire, at Midsummer Meadow, Northampton. (Silencers required).
August 24	TORBAY RALLY. Open R/G/P, F.A.I. Rubber, Chuck glider at Woodbury Common, Exmouth, Devon.
August 31	WEST OF ENGLAND R/C SCALE AIR DAY, Westland Aerodrome, Yeovil (on A30 between Yeovil and Crewkerne). Pre-entry - essential for super-racer - and details from D. Sheppard of 14 The Drive, Whitchurch, Bristol BS14 9JB. No entry fees.
August 31	WOODFORD MODEL AIRCRAFT RALLY Open R/G/P, Tail-less, chuck glider, Rat-race, F.A.I. T/R, Y2A, Combat, stunt, R/C multi free style aerobatics, scale F/F, C/L and R/C. Entry fee 5/- per event, juniors 2/6. Commence 10 a.m. at Woodford Aerodrome, Bramhall, Cheshire.
August 31	R/C THERMAL SOARING RALLY 'Towner Trophy' Golden Cross, Lewes, Sussex.
September 7	SOUTH COAST R/C RALLY, Golden Cross, Lewes, Sussex.
September 13	FLY FOR FUN Demo's, Sywell.
September 14	CROOKHAM AUTUMN GALA. Open R/G/P, $\frac{1}{2}$ A power C. d'H. 10 a.m. at Chobham Common.
September 14	S.M.A.E. C/L TEAM TRIALS, R.A.F. Upwood.
September 14	NORTHERN AREA Goodyear and Open Pylon R/C Races, R.A.F. Topcliffe.
September 21	EDINBURGH RALLY Team Pylon Race and Spot Landing, Donibristle.
September 21	SOUTH MIDLAND GALA, literally everything! Open R.G.P. $\frac{1}{2}$ A, C.d'H., Tailless Chuck, Helicopter, single and multi R/C, Vintage, Carrier, Combat, Stunt, $\frac{1}{2}$ A, F.A.I. T/R, Rat, Mouse racing, C/L. Entries to T. Healey, 22 Upper High Street, Harpole, Northamptonshire. R/C to D. Giles, Derron, Station Road, Bow Brickhill, Buckinghamshire. F/F to T. Payne 92 Coppice Drive, Parklands, Northampton. 2/6 each event at Cranfield.
September 28	SOUTH COAST GALA details later.
September 28	S.M.A.E. CENTRALISED R/C & C/L MEETING, $\frac{1}{2}$ A T/R, F.A.I. T/R, Stunt, Carrier, R.A.F. Upwood.
October 5	SPORTS RALLY (Performance Kits) Old Warden, Beds.
October 5	EAST GRINSTEAD GALA All-in F.A.I. (1st rd. 10.30-11.30) A/1, C.d'H. $\frac{1}{2}$ A Power, Chuck glider 3/6 entry, re-entry 2/6. Chobham Common.
October 12	LONDON AREA GALA, F/F, R/C, C/L, at R.A.F. Greenham Common, Nr. Newbury, Berks.
October 12	GLENROTHES Slope-Soaring, Falkland Hill.
October 19	YORK RALLY R.A.F. Elvington.
October 19	LONDON AREA C/L CHAMPS 3rd Round F.A.I. T/R, $\frac{1}{2}$ A T/R Combat, Charville Lane Circuit, Hayes, Middx.
October 26	ST. ALBANS WINTER COMP. All-in F.A.I. C.d'H., A/1, Chuck Glider, $\frac{1}{2}$ A Power, Chobham Common.
November 9	RICHMOND GALA. Open R/G/P, $\frac{1}{2}$ A, C. d'H., Chuck at Chobham Common.
November 16	ST. ALBANS THERMAL SOARING event for R/C gliders, Nomansland, Wheathampstead.

11¼" ornithopter

Designed by A. J. Brown

taper the outer 1" of the leading edge to a point
DO NOT cover the wings until later.

Bend the crank from 20 SWG piano wire, but do not bend the hook on the after end of it until it has been fitted in the model. The crank must be accurately bent as the lengths and angles are critical.

Before the crank is fitted to the model the bent pin 'bearings' for the lower ends of the con-rods have to be fitted. These are made by bending a small loop in the blunt end of a headless pin. Fix a small bead of solder on to the crank at the bend for the bottom crank and slide on two of the pin bearings. These are kept in place by a second bead of solder. A third solder bead is fixed at the other crank, two more pins slid on to the crank, and a final bead of solder added to secure these for the top crank.

The brass bush is made by melting a collar of solder round the end of a piece of brass tube ¼" long. This bush is pushed through the hole made for it at the front of the fuselage. The crank is inserted into the bush, and the motor hook bent in it. DO NOT PUT IN MOTOR UNTIL LATER.

Cut a piece of notepaper about 2" square, roll it over a needle to soften it, unroll it, glue one side of the paper and then re-roll it round the needle. Balsa cement should be used for this job. The paper tube dries almost immediately. Smear more glue over the rolled paper, remove it from the needle, and trim off the ends to give a piece of tube ¼" long. Twelve such pieces are required.

Push pins through eight of the pieces of tube and bend the pins as shown on the plan. Push the pointed ends of these pins into the ends of the wing mounts on the fuselage, two pins into each end.

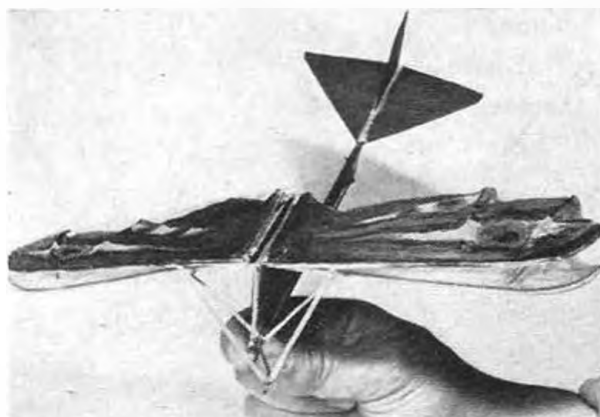
Glue the wing roots firmly to the paper tubes, using a generous amount of balsa cement. Note that the upper wings project ½" in front of the lower wings.

Check that the wings move freely on their hinges.

Connecting rods are made from 1/16" square hard or medium balsa, cut to the exact lengths shown on the plan. Push one on to each of the pin bearers on the crank, the shorter con-rods attaching to the two pins nearer the fuselage. If the balsa splits, lag it well with balsa cement. It can also be tied round with cotton and glued to prevent splitting.

Next insert pins into the four remaining pieces of tube and bend the pins through at a right angle. Push these pins into the other ends of the con-rods, as before, and then glue the pieces of paper tube firmly to the undersides of the wing L.E. in the position indicated on the plan.

Before covering the wings and fitting the rubber motor, turn the crank slowly to check the movement of the wings. First check that the upper wings do not go up to more than about 70° to the horizontal. Their maximum elevation can be adjusted by pushing the pins further into the con-rods, or pulling them out, as at right. Secondly, check that the upper wings are never in a lower position than the lower wings! Cure this fault by reducing the height to which the lower wings rise (by adjustment of the con-rods, as before). At one stage of the flapping the upper and lower wings should almost meet (as photo above right).

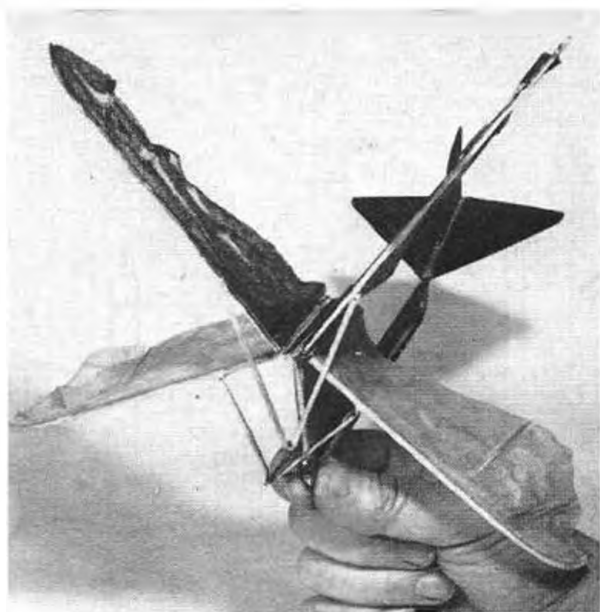


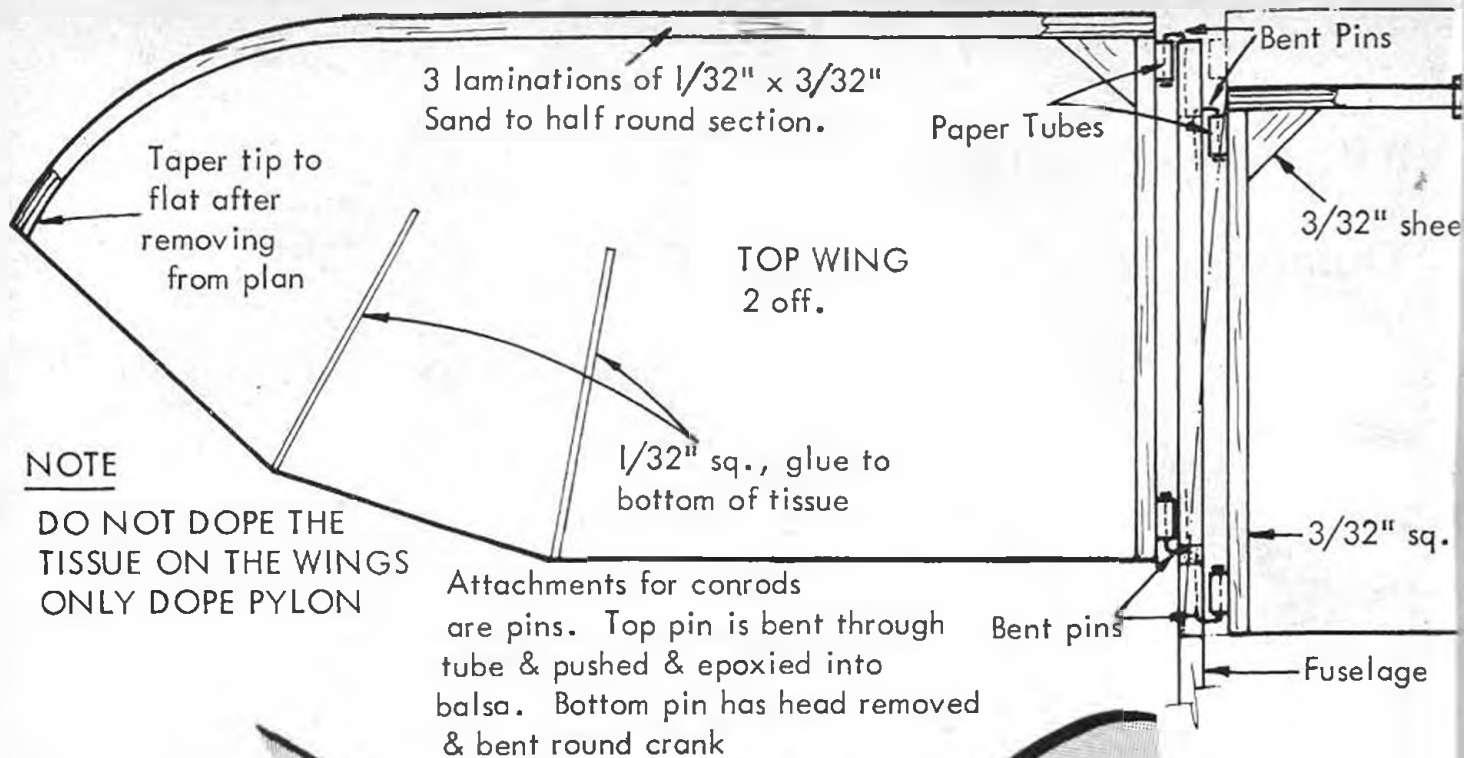
When all is moving correctly, tissue the wings, fixing lightweight tissue to the upper surface only. Allow the tissue to sag down about 1" at the middle of the trailing edge. DO NOT DOPE. Put in the rubber (four stands of ¼" wide flat rubber), and wind on a few turns by turning the crank with finger and thumb. Check that the wings move freely under low power. Gradually increase the number of turns letting the model flap without being released until checked that all the joints will stand up to full power (full power should be about 75 turns).

Test fly the model by releasing with about ¼ power. If the model turns to one side, this will probably be due to uneven covering of the wings, one wing giving more power than the others. This cannot really be cured, but does not matter unless the turning is excessive. In that case, re-cover the wings. The balance point of the model does not matter as the wings can never stall.

This is essentially an indoor model, but can put up a fair performance outside in calm weather.

FULL SIZE PLANS

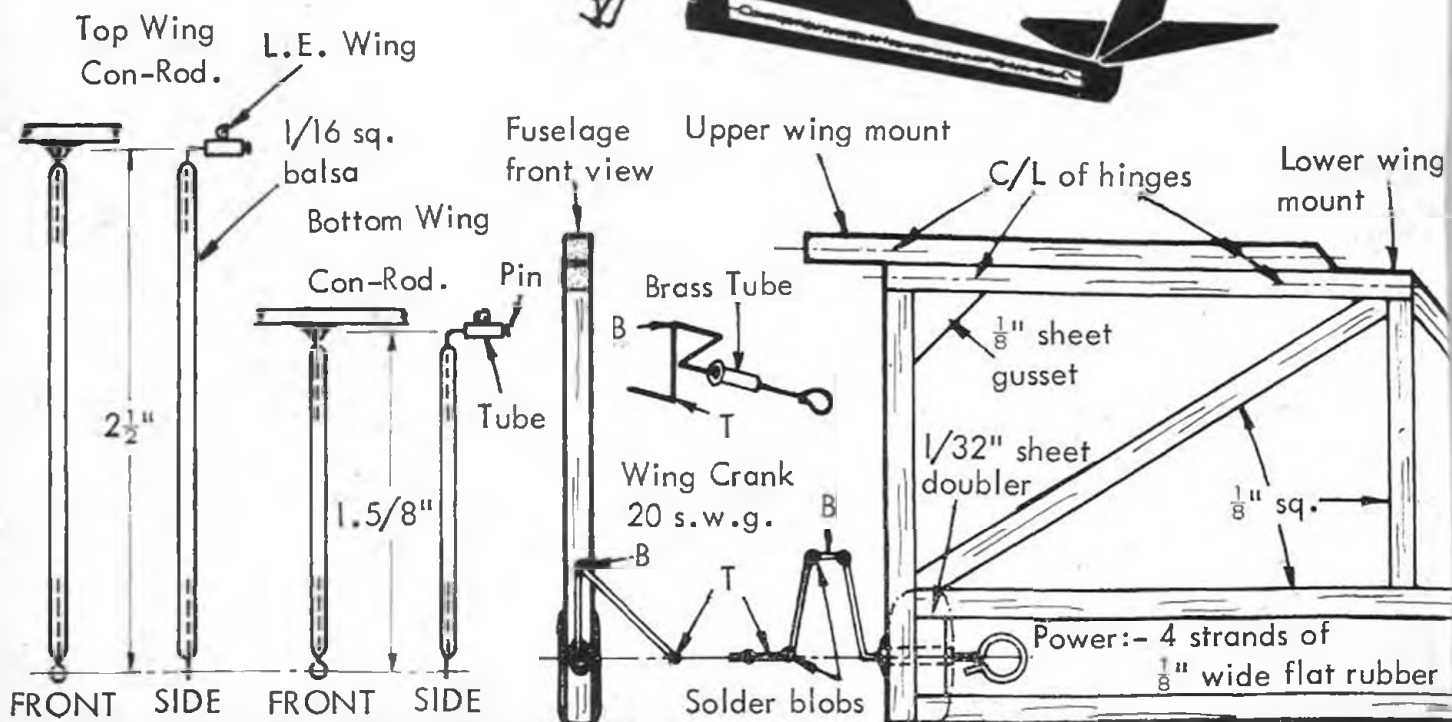




Flutter-By

11 $\frac{1}{4}''$ SPAN ORNITHOPTER
BY
A. J. BROWN

Cover wings with lightweight Tissue, glue to top of wing.



Paper tubes made by rolling small piece of paper round a pin, glue one side of paper.

Position of tube, Same on all wings, glue to leading edges of wing, underneath.

Actual size of tissue

$1/32"$ sq.

BOTTOM WING
2 off.

Tailplane support

4 stages of operation at right, illustrate stages of crank operation at 90 degree intervals. "B" refers to Bottom wings, "T" to Top wings. Sketches show wing positions in relation to cranks.

NOTE

The lengths of the con-rods are critical, make to exact length as shown on plan, epoxy pins into balsa.

Put tube through hole and leave $1/16"$ projection, solder round tube to form collar

Solder collar

Sketch of tube

Leave open, cover pylon both sides with tissue

20 s.w.g. hook

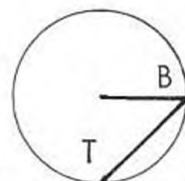
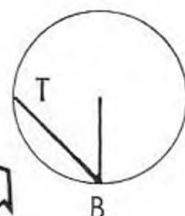
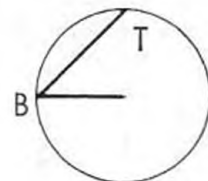
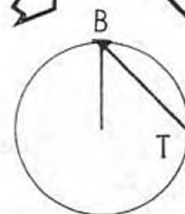
$1/8"$ sheet.

$1/8"$ sq. support

Tailplane

Fin from light $1/32"$ sheet

Tailplane light $1/32"$ sheet





Two views of the Soviet 'Veterok' 1.5 c.c. diesel, an example of the small general-purpose model engine available to Russian modelers.



LATEST ENGINE NEWS

by Peter Chinn

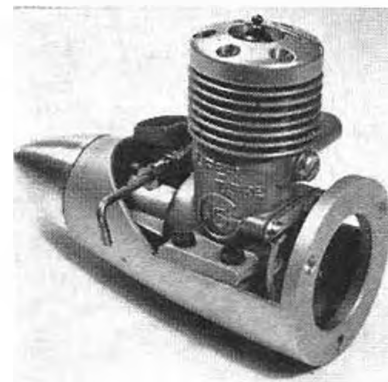
S.T. 'Gambrinus' Mount

Now available from World Engines is what appears to be a production version of World Champion Hans Seelig's aluminium radial-mount-cum-semi-cowling for F.A.I. free-flight power models. Weighing exactly 11 oz. (39 grammes) complete with mounting screws, it is a pressure diecasting (instead of being machined) but has approximately the same overall dimensions as Seelig's original. Maximum diameter is 45.4 mm., overall length 70.2 mm. and its profile shape follows the contour of the standard G.15 spinner assembly.

Although primarily intended, one would assume, for the front induction G.15 (which, particularly in its Mie-



New product from the Super-Tigro factory is this Seelig type engine mount for free-flight models. It can be adapted to various G.15 and G.20 engines including the standard G.15 and the G.15RV-D models shown.



bach-Zilliken version, still seems to be the best motor in the G.15 range) the mount can take, or can be adapted to take, with minor modifications, most of the G.20 series engines (15, 19 and 23) and also the disc-valve G.15's

Russian 'Veterok' 1.5 c.c. Diesel

Russian model aircraft engines have been seen from time to time in the U.K. for the past twenty years but are still quite rare. The Soviet Union has no commercial model industry as we know it and the engines that the ordinary Russian modeller can buy are, quite frankly, rather inferior by Western standards. The range of types obtainable is very limited and most of them are of decidedly 'dated' design. Many Russian engines are copies of foreign products. For example, the still current 2.5 c.c. MK-12V diesel is a close copy of the West German Webra Mach-I designed by Gunther Bodemann some sixteen years ago and long since out of production, while the 2.5 c.c. MD-2.5M Meteor glowplug engine, a more up-to-date example, is clearly based on the Italian Super-Tigro G.20 1960 series.

One current engine which appears to be somewhat more original in concept is the 1.5 c.c. *Veterok* diesel, an example of which we acquired for our collection a year or two ago.

This, made in Kiev, is a shaft-valve unit and its general construction can be seen in the photographs. A single casting embodies the crankcase, cylinder casing and main bearing, this latter being unbushed. The counterbalanced crankshaft has an 8 mm. dia. journal, 4 mm. crankpin and 5 mm. gas passage. A machined aluminium prop driver is keyed to the shaft by a brass split taper collet. The cylinder liner is flanged at the top and locked in the casting by a screw-on cylinder-head. It has single exhaust and transfer ports, the latter being placed low in the cylinder with timing restored by the use of a chamfer on the transfer side of the piston. The piston uses a fully floating 3 mm. dia. gudgeon-pin without end pads and a rather poor diecast conrod.

The engine has a bore and stroke of 11.8 x 13.5 mm. and weighs 99 grammes or 3.49 oz.

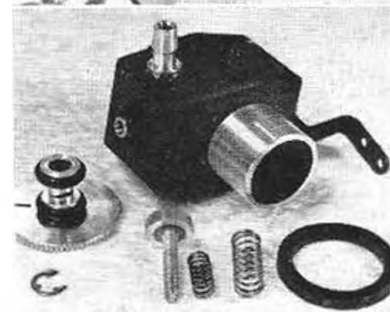
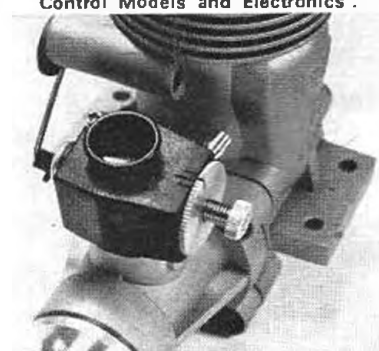
'Topsy'

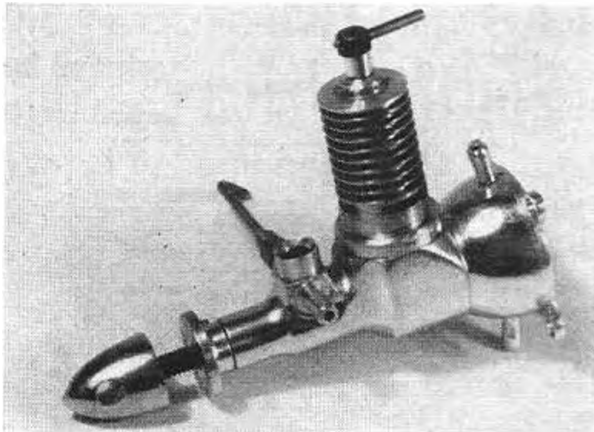
We have been asked to say a few words about the *Topsy* 0.375 c.c. diesel designed by G. Hugh and recently featured as an amateur construction project in *Aeromodeller*.

Before we go any further let us first congratulate Mr. Hugh on his accuracy in describing the *Topsy* as a '.375 c.c.'

engine! Based on a bore and stroke 0.312 x 0.300 in., the *Topsy* is just that, i.e. .02293 cu. in. or 0.3753 c.c. Of course, you will say, any third former should be able to work out that little sum. Agreed. What has puzzled us for years is that so many commercial engine producers are apparently incapable of doing third-form arithmetic. Over the years we have checked hundreds and hundreds of engine capacities from quoted bore and stroke measurements and we can honestly say that three out of every four manufacturer's displacement figures have been wrong. In a few cases the inaccuracy has been so great that an engine has actually been placed outside the class in which it was intended to compete and the factory has been obliged to reduce the cylinder bore or crankthrow of the engine to bring its capacity within the required limit. However, let us get back to the *Topsy*.

The latest in R/C throttle systems is seen in the new Perry carburettor from America. The large knurled disc is for adjusting the idling mixture independently of the high speed valve. Full details of this carburettor will be found in the current issue of 'Radio Control Models and Electronics'.





As the designer has remarked, there are no really small diesels now on the market. At one time there were quite a number, ranging from Davies-Charlton's Bambi, of a minuscule 0.15 c.c., up to the 5's of which quite a number, British and foreign, were offered during the nineteen-fifties and early sixties. The only current engines of comparable size to the *Topsy* are, in fact, the American Cox *Pee-Wee* and *Tee-Dee* 0.020 glowplug units of 0.326 c.c.

There is still, undoubtedly, a demand for very small diesels. Unfortunately, it is one which is not large enough to sustain the interest of modern manufacturers who, in order to make model engine production economically feasible nowadays, must construct either large numbers of small cheap engines or lesser numbers of large expensive ones. The really tiny diesel, unfortunately, does not fit into either category.

In these circumstances it is not surprising that the demand for drawings of the *Topsy* has been quite brisk.

Weighing just 31 grammes, or 1.09 oz., complete with fuel tank, the *Topsy* is of commendably modest weight, but is by no means flimsy in construction. The only point about which we have some reservations is the radial tank-mount—notably the bulkhead mounting lugs which, 0.55 in. thick on the prototype and shown as only 1/32 in. on the drawing, would, we feel, be a bit vulnerable in a crash, especially in view of the engine's quite considerable overhang.

Some of the construction features of the *Topsy* are both unusual and interesting. In using six transfer passages drilled vertically upwards, in effect, through the cylinder wall, the *Topsy* can be likened to the Mk. II *Frog* 100 introduced in 1958, but the use of an Araldited cylinder base to form an annular transfer chamber below inclined inlet ports into the cylinder is certainly a novel idea. We particularly liked the connecting-rod with its elegant H-section tapered shank. Such sophistication is not to be found on commercial engines! The method of fitting the prop driver is quite unorthodox, yet seems to work very well.

Outwardly the *Topsy* has, perhaps, something of a vintage air about it. This is largely due to its rather tall cylinder which suggests the small-bore long-stroke combination so widely used by diesels of the middle and late nineteen-forties. In fact, the *Topsy* is not a long stroke engine at all, its S/B ratio being only 0.961:1. And, with its inclined transfer ports and 'modern'

Above, the prototype 'Topsy' D.I.Y. engine instructions are reprinted as a leaflet through A.P.S. Right, parts of the *Veterok*. In quality, the engine does not measure up to acceptable Western standards.



port timing, including a very short exhaust lead, it is anything but antediluvian in concept.

Diesels in the 'sub-miniature' sizes were never among the easiest of model motors to handle. Newcomers to the model game used to be warned against buying baby motors and recommended to start with something in the 0.75 to 1.00 c.c. class instead. These latter were considered (quite rightly, usually) to be more tolerant to the clueless handling that model engines are called upon to suffer at the hands of beginners.

We were not exactly surprised, therefore, to find that the *Topsy* was not entirely foolproof as regards starting. One needed to be patient and learn to appreciate the little engine's idiosyncrasies. We suspect that too much time spent with 10 c.c. radio-control engines may have resulted in too casual an approach on our part!

A slight bother was experienced in keeping the screw-in tank mount secure in the crankcase. Restarting the engine when it was hot, we occasionally contrived to 'flick the engine undone' from its tank. We believe, however, that this was due primarily to our test mounting. This rig is of all-metal construction, the engine being bolted to a machined aluminium faceplate which not only held the tank very rigidly but probably kept it sufficiently cool, aided by its content of fuel, to result in loosening through differential expansion between it and the crankcase. With the engine mounted in a model, this should not happen. If it does, one may, perhaps, be forgiven for going against Mr. Hugh's recommendation and screwing the tank in a little more firmly than just finger tight. Probably a thin paper gasket between

the joint faces would help and also prevent the tank and crankcase from becoming misaligned when further tightened.

Propeller tests

Two props were supplied to us with the prototype *Topsy* to try out. One of these was a 5½ in. home-made wooden prop of very wide blade area and the *Topsy* turned this at 8,100 r.p.m. The other was a Keilkraft nylon 5x3 and with this 10,600 r.p.m. were recorded. We also tried a 7x3 Top-Flite wood (which the *Topsy* turned at a very respectable 7,600 r.p.m.), a 6x4 Top-Flite nylon (8,400) and a 5½x3 Tornado (11,200 r.p.m.).

Although we did not attempt a full test to determine power and torque curves, our impressions are that the *Topsy* would be better on the larger, rather than the smaller, of these props. The 7x3 and 6x4 sizes seemed to suit it very well and these, too, should be particularly appropriate to the sort of small free-flight model for which the engine was designed.

Advice for the 'Topsy' maker

In a diesel as small as this, the effects of any inaccuracy or sloppiness in its construction tend to be greatly magnified, resulting in difficult starting or erratic running. The best advice we can offer to those intending to make a *Topsy*, therefore, is to maintain the greatest possible accuracy when machining, particularly where this affects the transfer port timing and gas tight joints, and to pay meticulous attention to the finish and fit of the individual parts, especially the piston and cylinder bore.



Mike van Eyk of East London and his 'Hi-FAI' which placed 2nd in F.A.I. Power and earned him a place in the World Champs team.

JOHANNESBURG, in the Province of the Transvaal, was the venue for this year's South African F/F and C/L Nationals. This meant far travelling for most of South Africa's modellers. From Cape Town, this meant almost a 1,000 miles at top speed. Two of Cape Town's modellers, Herb. Newton and John Cowlin, rolled their car twice, completely wrecking it on the way up and were not able to compete. Fortunately neither were seriously injured in the smash.

Friday, 4th April, 1969, saw the start of the Championships and, most unusual for the Transvaal at this time of year, the weather which greeted us was cold, wet and windy. However, it improved to warm and windy later.

The overall CD for Free Flight was Kurt Sager of Switzerland — out there on business. Many a CD can take a leaf out of his book.

First event was Wakefield which was flown from 8.30 a.m. to 15.30 hours and attracted eight entries. Most entrants flew



Above, the newly established Mini-World circuit at Boksburg, equipped with lap counter clocks as below for S.A. C/L Nats.



OVERSEAS NATIONALS

South Africa reported by Basil Moore

OD's and Mike van Eyk of East London's M.A.C. had one of the best built planes it has been my privilege to see for many a year. The first round produced one solitary max — Mike van Eyk — while the remainder a 120 secs. approx. each. Round 2 produced 1 max as well — B. Partridge of Rand M.A.C. Round 3 saw van Eyk produce another out of the bag. Round 4 saw two max's — J. Swallow of Rand M.A.C. and R. Rowe of Western Province M.A.C. proxy flown by Basil Moore. In Round 5 Swallow repeated his performance and M. van Eyk pulled another out of the hat. Round 6 recorded 1 max — by Vic Hoxley of Port Elizabeth M.A.C. Vic had been having bad luck as he had lost his best model on the first flight (it was later found some distance from where it was thought to have landed). In Round 7 Vic Hoxley was the only one to record a max.

M. van Eyk	180, 144, 180, 77, 180, 3, 95	859
J. Swallow	119, 107, 135, 189, 180, 50, 68	839
V. Hoxley	152, 70, 43, 3, 165, 180, 180	793

Flown concurrently with Wakefield were JA Power (7 entries) and Open Glider (14 entries of which 10 flew).

As is usual much was the prangery in the JA Power and in the conditions prevailing it was surprising that four of the seven entries survived. There were no great feats (except for Eddie Burroughs slipping on one flight for a full house) in this event and one wonders at its being kept in the calendar.

E. Burroughs (RMAC)	180, 180, 69, 180, 180	789
W. Gunnell (E. London)	76, 170, 77, 89, 85	497
M. Morrison (RMAC)	180, 53, 41, 86, 47	407

Open Glider gave us a glimpse of one who was to prove the new star of the A/2 World — A. Boncompagni of Rand. Antonio migrated two years ago and has proved to Rand M.A.C. that it is so easy to find lift (sometimes).

Conditions were such that only three max's were recorded. Towing was tricky and there were a few folded wings in evidence due to the inability of the flyers to release in rising winds.

R. de Jager (Durban)	84, 92, 180, 112, 64	532
A. Boncompagni (Rand)	98, 51, 180, 72, 63,	464
E. Burroughs (Rand)	94, 108, 46, 104, 66	418

Saturday, 5th April, dawned clear with the promise of plenty of lift and we were not disappointed. 10 max's in the first round of A/2 (18 entries) 5 in Round 2, 8 in Round 3, 7 in Round 4, 5 in Round 5, Rounds 6 and 7 produced but a drop in the ocean.

Boncompagni scored a full house and then set a new South African record by doing 218 secs. in Round 8. This boy flies beautifully and is a force to be reckoned with. No piggyback flyer this. Essentially a 'loner'.

A. Boncompagni (O/D)	180, 180, 180, 180, 180, 180, 180	1260
J. Carswell (WPAMC)	180, 180, 125, 131, 180, 180, 180	1156
B. Partridge (RMAC Talon)	180, 180, 180, 165, 37, 180, 180	1102

Flown concurrently with A/2 were Open Power (5 entries) Open Rubber (3 entries) and Chuck Glider (plenty of entries) some built on the field.

Open Power		
J. Calefatto (WPAMC)	180, 65, 88, 180, 160	682
J. Carswell (WPAMC)	53, 114, 180, 180, 144	671
E. Burroughs (RMAC)	103, 60, 180, 180, 133	656

Open Rubber		
Vic Hoxley (PE) O/D	104, 131, 139, 150, 90	614
E. Burroughs (RMAC)	110, 110, 180, 66, 60	527
M. van Eyk (ELMAC)	58, 45, 29, 49, —	181

Chuck Glider		
J. Swallow, J. Nevill, R. de Jager		

Sunday, 6th April, again proved to be a day of heat, wind and varying fortunes. Lift was patchy but strong.

FAI Power attracted 11 entries and soon resolved itself into a tussle between van Eyk of East London, Swallow and Partridge of Rand, and Carswell of W.P. The contest was wide open until the 6th round when positions were as follows:

Swallow	839 secs.
Carswell	834 secs.
Partridge	831 secs.

Came Round 7 and nerves were on edge. Carswell, judging his conditions well was first of the leaders to get away and flew straight into a strong, but strong, man, bubble — five minutes later he D/T'd but the plane was lost. Swallow followed but was down for 149 secs. — M. van Eyk stormed from the rear to total 995 secs.

J. Carswell (WP)
Fatal 116, 108, 180, 70, 180, 180, 180 1014 secs
M. van Eyk (EL)
O/D 180, 180, 133, 93, 180 49, 180 995
J. Swallow (RMAC)
O/D 83, 180, 36, 180, 180, 180, 149 988

The day ended with nine chaps battling it in A/1 Glider.
E. Burroughs (RMAC) 120, 102, 120, 120, 120 582 Ariglet
V. Hoxley (PE) 58, 94, 52, 97, 103 404
L. Godwin (EL) 45, 38, 58, 120, 120 381 Aquarius
Eddie Burroughs of RMAC was then well deserved winner, of the Free Flight Victor Ludorum.
The members of the South African Team for Wiener Neustadt were announced at the end of the day. The composition of the team will be decided later but the names are as follows:—

A. Boncompagni, J. Swallow, B. Partridge, R. Rowe, J. Calefatto, J. Carswell, V. Hoxley, M. van Eyk.

The Team Manager will be A. Bonamour, President of the S.A. Model Aeronautical Association.

Control Line

These events were flown at 'Mini-World' outside of Boksburg (about 30 miles from the F/F field) Mini World is an ambitious extension of Maduradam and in time to come it hopes that the world will be represented in 1/24th scale spread over acres of ground. At the moment the project is just starting but the owners laid down a concrete circle for the Championships and this proved to be the making of a good week-end's flying.

Organisation was in the hands of Basil Menges and Vicky and Allan Duncan. There were no hitches. Flying was of a good standard. Electric lap counters, made the otherwise drab (that is from the spectators' point of view) T/Race

events, come to life. Excitement built up and could be felt as a result of this innovation.

Results

J A T/R	Scholtz/Menges	13:00	O/D Paw 149
	Pigeon/Traut	—	O/D Webra
	Masters/Masters	—	Countdown OK Cub
B T/R	Scholtz/Menges	8:24.7	O/D KB 29
	Nissen/Nevin	11:14.6	O/D Oliver 3.5 Tiger
	Billyard/Nevin R.		
Rat Race	J. Billyard	8:27.5	O/D KB 40

Speed

W. Gunnell	29.1 secs.
J. Billyard	31.6 secs
P. Parsley	32.3 secs

FAI T/R

Ted Nissen	11:48.7
B. Monges	12:36.1
N. Koch	12:39.6

The Combat events provided the most spectator appeal as usual and many good flights came to light. Engines started well and there were hardly any delays.

Open Combat

R. Nevin (RMAC)	O/D
J. Nevin (RMAC)	Voodoo
J. Flanagan (RMAC)	Twin Engined O/D

FAI Combat

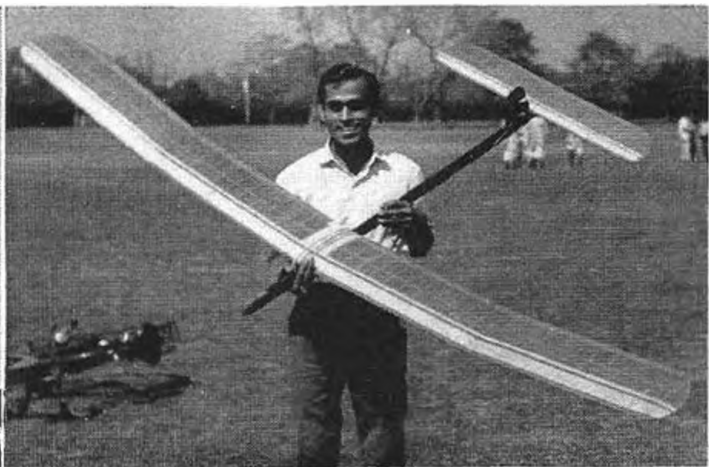
1 B. Menges (RMAC), 2 J. Billyard (RMAC), 3 E. Nissen (RMAC).

The week-end was rounded off with a Dinner/Dance at the Rand Airport where, as usual much friendly spirit (bottled and otherwise) was in evidence and prizes were handed out by Mrs. Ruth Parsley, wife of the Chairman of RMAC.

★ ★ ★ ★ ★ ★ ★ ★ —INDIA by P. Banerjee

THE 20th INDIAN National Model Aircraft Championships were noted for the high standard of flying in spite of the stiff breeze which blew throughout the day. The Aeromodeller Challenge Cup had the largest number of entries and some good flying, especially by power men from the Punjab air squadron, which gave the Air Squadron boys 3rd, 4th and 6th places. Winner S. Dutta won by virtue of long periods of towing with his much modified 'Lucifer'. Open Power Ratio was dominated by A.P.S. designs with the top place going to a well-flown 'Slick Stick'. Most of the entrants in Open Rubber had slow climb/long motor run combination and could do little in the brisk wind. Most enjoyable event was F/F floatplane while formerly popular C/L stunt and speed were very poorly supported. Concours was won by a superb 'Tiger Moth' and Mrs. Ratnesh Singh surprised everybody when she won the last event of the day, Payload, with a Graupner 'Kadette'!

Right: Jr. S. Banerjee with 'La Mouette', lost on its first Max, below left: Power winner S. B. Nandy releases 'Slick Stick', finished the night before! Below is D. K. Bhowmic, who came second in Open Glider with his 'Meanderer'. Background looks like the familiar British patch rather than a Punjab thermal oven!



OVERSEAS NATIONALS —AUSTRALIA

Pictorial commentary on the events
at Warrnambool by M. J. Mildren



The Old Timers event was dominated by the Victorian Modellers. Barry Dundas flew a Sal Taibi 'Hornet', Forster 99, Spark Powered. Poor weather proved its undoing. R. (Ford) Lloyd won the event (3 round score of 526) with his 'Eastern States Gas Champ', O.S.19 powered.

The 3 categories were combined for Scale, the flight being purely qualifying, and points given for appearance only. Bob Greenhill with his 64 in., span 7 lb., O.S.35 powered 'Gladiator' was the only F/F qualifier. Came 5th.



SITUATED approximately 160 miles from Melbourne on the South-West coast of Victoria, Warrnambool is the centre of the rich Western district, and is well known for its pastoral, agricultural and industrial activities. It is also very popular as a tourist resort, with Motels, Hotels, Caravan Parks, and Camping grounds aplenty; all booked out 6 months in advance. The organisers made bulk bookings on behalf of the prospective contestants, which solved that problem.

The weather ranged from very good (sunny and calm) to very poor (windy and cold) - never impossible, and never excellent.

FREE FLIGHT events were held in a large paddock in fairly flat country 5 miles out of town. Two clumps of trees $\frac{1}{4}$ mile away, but otherwise clear for a mile or so in all directions. Extremely lumpy surfaces covered with foot-high grass. Conditions were poor for A/2, as reflected in a winning 7-round score of 746 by L. O'Reilly of South Australia.

CONTROL LINE events were held at the Friendly Society Oval on the west side of the town. The surface sloped, but uniformly, and extra mowing by the organisers on the actual flying circles left nothing to complain about. Australian control-liners generally refuse to fly on hard surfaces, and insist on turf.

RADIO CONTROL events were flown from the smoothest spot in the F/F paddock. It was still fairly bumpy, however, particularly inconvenient for the Scale Models, and bad for the Multi's. Most of the R/C flying was done in a still breeze.

Wakfield was won in fine style by Don Wotton - recently of Hayes Club, at present doing a stint at Woomera - (below left) with a 7 round score of 979. His own design model has Reike tips to give good glide with low aspect ratio. He won Open Rubber, too - different model.

Combined Speed was scored on the percentage-of-the-record-in-that-particular-class basis. Len Buck won by cracking the Class III record (101 per cent) with a S.T.ABC60 powered model. Steve Harmati, a modeller of 13 months' experience, frightened the old hands by coming 2nd with 99½ per cent of the Class II record. Below are the F.A.I. Combat placers: 1. Bristow (left) S.T. G15; E. Densler (cent) Taipan 88; T. Stowe (right) S.T. G15. G15 was most popular motor in F.A.I. Combat.





Maurice Mitchell (above) had a finely detailed model in each scale category. Below is his R/C (Rudder only) 54 in span Tiger Moth, Taipan 19 powered. Weighs 5½ lb. Placed 3rd. He also won the combined event with C/L Martin Marauder, O.S.29 and 35 powered (above) with retracting U/C. flaps, brakes, throttles, and lights. Monokote covered, took 9 months to build. Basil Healy came 2nd with his Bolkow Jr.

Team races were generally uneventful and smoothly run, except for the final of the Class II, where one team stopped their model with the motor still running and were cancelled, and 30 seconds later another team lost control of the model and pranged themselves and the two remaining models. The heat times were used to decide the place-getters. 1st Finalists (L-R below) Pring/Dowling (Taipan), Newcombe/Bristow (Taipan), and Neville/Arthur (Oliver Cub) in order of finishing.

Blue Coppock brought all his F/F models to the Nats in this ingenious carrier at right. Ron McPhee took S.T.G.15 out of F.A.I. C/L Speed model and installed it, with tuned pipe, in Hans Bertina's 'Centurion'. First flight was a Max., second flight ripped the wings off. They spent 3 rounds repairing, 1 round trimming, and in the final round did a hair-raising climb to twice the height of all else.



READERS' LETTERS

Dear Sirs,

It was with some surprise that I read 'Heard at the Hanger Doors' for July, in which you stated 'Aircraft manufacturers have extraordinary mixed views in their attitudes to applications for details from modellers'. In the two instances in which I had had occasion to write to Cessna in the U.S.A., I have always received, by Air Mail, a three view 1/72nd drawing, and a copious sales booklet, and in one case, two beautiful photographs of the latest model 172.

I have also written to Beagle for information and was sent the enclosed letter together with some invaluable colouring and detail data.

Captain Gunn was both prompt and helpful as his letter shows.

Leatherhead, Surrey.

S. W. Moss

In identification of VFW as a fine example of co-operative manufacturers we did perhaps do an injustice to our friends in Beagle, Hawker Siddelay, B.A.C., Britten-Norman and of course, Piper, Cessna, L.T.V., G.D., McDonnell-Douglas and Boeing. However, none of these companies is doing what VFW has started, namely a series of historical monographs on their aircraft, for issue to air historians. The Harrier feature is an excellent example of manufacturer co-operation coupled with our own application of measuring tape and photography.

Captain Gunn's letter to Mr. Moss recommended our drawing RC 983 for the single channel R/C Pup, price 3s. 6d. (plus 6d. postage).

Nats thanks

Dear Sir,

I would just like to say how much our club enjoyed the 'Nats' this year. We all thought that the organisation was excellent, especially on radio (i.e. crowd control; smooth running of events; safe flying away from the crowds, etc.).

The only grumble that we've got is that dear old Hon. Sec. was just about to enter open glider, when the model hit the rugby post on the first tow up. Oh well! you can't win 'em all.

Hewall M.A.C.,
Wirral, Cheshire.

Michael Gibbings

Engine production

Dear Sir,

With reference to the comments in Engine News in the June Aeromodeller on the model engine manufacturing situation in Britain at the present time I would like to suggest that it is the failure of model engine manufacturers to adjust to changing requirements that has led to their present problems.

Of the model engine manufacturers

that you list (which excludes Mearco) only two make glo-plug engines and only one each at that. One of these is a racing engine only recently made available with a throttle. The other is an 0.49 which is an adaptation of an early diesel and as such does not offer much competition to the Cox .049 series. All the other engine manufacturers are engaged exclusively in the production of rather dated diesel engines, few of which approach modern requirements and some of which, in order to retain relatively competitive prices have deteriorated in quality since they were first produced. Some small diesels offered for beginners' use are distinctly unsuitable, by reason of starting characteristics alone, for such an application (I have a number in my collection that I would not have the nerve to sell anybody).

Only one British manufacturer is engaged in the production of a series of glo-plug engines but even this range omits the sub-29 sizes for which there is such a growing market. If British manufacturers are to compete with Japanese, American and Continental producers they will have to start making small throttleable glo-plug engines for R/C work and a good quality beginners glo-plug rather like the Cox, if they do not they will justly suffer extinction.

Mablethorpe.

David Shields



CLUB NEWS

One of the most colourful transfers we've yet seen is this one, mainly red and yellow

A GOOD model flying day is a matter of coincidence; the coinciding of the weather's condescension and your own availability. It is most exasperating to look out of the office window on to a perfect spell of flying weather with almost the certain prospect of the usual gale force winds building up by the week-end. Sometimes we have the luck to indulge in a spot of evening flying, and I can think of nothing more relaxing and agreeable than a few leisurely flights in the calm of a warm, summer evening.

Starting where I left off last month, The Grantham & D.M.A.S. is cramming much diverse activity into a packed summer programme. From talk of a restaurant dinner, with a solid/plastic Concours as a dessert, we find ourselves at R.A.F. Barkston Heath for a R/C Spot Landing Contest. In between there is mention of a very comprehensive C/L agenda, and a Ladies' Glider event, of all things. Starting, however, at the beginning, the year got off on the right foot (or should it have been the left?) in the R.A.F. Drill Hangar at Spitalgate with a series of chuck glider and micro-film comps. No times given, though. Fittingly, the new Chairman, following the retirement to Vice capacity of long-serving Mr Arthur Percival, is Fl. Lt. Peter Bullivant, R.A.F. Keenest club types are those C/L boys who have been flying in the keenest of wintry weather. Several crashes, we are told, were caused by the icing up of control lines; but no mention of climbing along same with ice-picks. Big event on the C/L front is a combined Scale and Carrier event which is being planned by Comp. Sec. J. Pratt for September 21st (lunny! - thought the Carrier was to be at Cranfield on that date?) This to be followed by a 900-lap marathon team race the following Sunday. Turning to the wire-less form of control, naturally enough there is an up and coming button-pushing section ready to show its paces, and there was a good turn-out for the first Spot Landing event held on May 4th. Notable entry was a beautiful A.P.S. Vintage Black Magic flown by Dave Wyatt. And 'no hands' as it were, the club has the support of a strong, free flight section. For all this varied enthusiasm the use of two airfields: R.A.F. Spitalgate during evenings and R.A.F. Barkston Heath at week-ends. Interested? Then drop a line to the Secretary, D. Richardson, c/o The Sports Shop, London Road, Grantham, Lincs.

New Secretary of Crawley M.A.C. is R. Chapman, of 'Laburnum', Woodlands Road, Redhill, Surrey. He has encouraging news concerning the club's financial state, thanks to a fully paid-up membership of forty conscientious souls. Encouraging, too, the stirrings of enthusiasm towards getting the Crawley name back on top of those contest result sheets. Sightings are set on the prime target, the R.A.F.A. Shield. A popular club flying programme includes Mouse Racing, Mini-Combat (fighting over girls?), Stunt, Chuck Glider and a Rubber-powered Scale Event for KeilKraft and Veron Kits. The club meets at Hazelwick School, Crawley, on Thursdays.

The paradox of success is described in 'Ed's Column' in the *Circuit*, newsletter of the Elliot Model Eng. Club. Starting out as a non-specialist club, it has produced a number of highly specialised, competent modellers, but alas, it has also produced a breakdown of social relations within the club because of this very fact. All too typical, though, of the way the hobby has been splitting up in recent years into widely diverse groupings who have little in common with each other. How then to block this trend and find a common unity? Well, R/C, C/L or F/F, all denominations are aeromodellers, and it is suggested here that it is much a matter of attitudes. It is foolish for groups to become anti-other groups for no sufficient reason when a spirit of mutual tolerance and co-operation would be beneficial to all. A less weighty topic is the odd fixture given to the club demo-team. What was supposedly a Fête turned out to be hot-rod racing autocross! The team was asked to fill in during the exhaust cooling interval. In spite of the ravages of the

hairy autos over the fair face of the park, the demo went with a swing, with quite a decent sized crowd enjoying an impromptu display of varied flying. On the Combat front, John Langridge is looking into the possibilities of the *Liquidator*, featured in the *Aeromodeller*.

Big news from the Three Kings Aeromodellers is of the Southern Area Gala Stunt Contest, organised and run by the Three Kings worthies. Perfect weather and a large turn-out provided the right sort of ingredients for a successful day, and all who participated had a most enjoyable time. Singular complaint was for a computer to tot up the mass of scores. Only a jocular gripe, but the portable computer might well be a commonplace piece of equipment at events in the not so distant future. After all, who learns to count these days, apart from Tax Inspectors? Kismet, the fates are taking a hand in the affairs of the club. In order to find the most exciting format the team made a number of 'dummy runs'. These showed that a good entertaining display could be staged with two in a circle, Stunt, balloon bursting, model busting (deliberate and incidental) and touch and go throttle landings. Plus a spot of Scale and Combat. The most stringent safety measures to be applied. Speaking of Scale, Mick Harvey, British Stunt Team Member is hard at work on a Yak-9D, designed by clubmate H. C. Queck. Should prove an eyeworthy project. Laurie Glover tells us that, although membership is now fully subscribed, there is always room for the experienced Stunt or Scale man. If you are a loner, or recently moved into the area, why not drop in at the White Hart, Cricket Green, Mitcham, on Tuesday nights, or on the Mitcham flying every Sunday morning.

Hats off to the Anglia M.F.C. for running the Camp Site at the Nationals. A chore which no-one else seemed to relish. Had they not opted to do the job there would have been no provision for camping at the Nats at all. The current newsletter has a few words to say on Coupe D'Hiver. The contributor found this small, low power class of model to be quite a challenge. In order to get optimum performance much patient and accurate trimming is called for. Best results obtained with a right/right flight pattern, using slight wash-in on the starboard inner panel to hold the climbing turn. Why not try one of these models? Virtually crash-proof if built with tubular or sheet fuselage. And to end on a sad 'storey'. Someone has had the gall to build a bungalow right on the flying field. Silencers now a must. But if single storeys give trouble so does Single Channel. Seems that super regen flying is not in favour on the club fields. Someone even proposed that it be banned altogether, but less drastic opinion prevailed, with the result that super regen is to be limited to certain specified periods. No such troubles in Free Flight, where, in the Sandman Trophy, the flyer is put on his honour to send in fifteen self-recorded flight times in one class and five in another. All flights to be made after 6 p.m. to a 2 min. max.

Getting himself 'run in' is the new P.R.O., of Whitfield M.A.C., N. R. Crane. His short and sweet newsletter reports that a full Committee emerged from the A.G.M. - volunteers to a man, of course. Point of concern is the falling off in club meeting attendances. Remedy sought is to liven up the meetings with programmed events. On the agenda so far are a Chuck Glider sortie, a film show, actually featuring model planes, and a 'Bring a Model' Night. On the publicity side a display is set for 14th June at Wythenshawe Hospital. Co-operation of members desperately sought.

Are you a plastic modeller, or is that your normal colour? Anyway, if you are interested in the solid state of things, you might like to know that a Plastic Modelling Group has been formed in Oxford. The group is to meet on the first Monday of each month at the West Oxford Community Centre, Helen Road, Oxford. It is hoped to give particular encouragement to younger members. Details from the Oxford Model Centre, 94 St. Clements, Oxford. Tel. 40551.

The Newsletter of the Model Aeronautics Council of Ireland stresses the need for safe flying. Often, it says, risky flying is all too easy for the model flyer, for he himself is only marginally at risk. In most other sports the element of danger is fully shared by the participant - motor racing, for example. It should be remembered that children can be particularly vulnerable to the off trim power or radio model as they have no real sense of the danger, although adults are often just as trusting, standing unconcerned five yards up wind of the launching point whilst we old hands are hiding under our cars. Hard news is that the Munster F/F Champs is to be held on the Curragh on the 17th August, and the R/C Champs at Ballincollig on the 24th.

An optimistic lot we model flyers, particularly if you relate the fragility of our craft and the vagaries of our weather to the fulsome state of our contest calendar. Luckily, though, few meetings get completely washed out or blown off, even when a blasting 50 mile an hour is in session. Such was the survival situation when the South East Area visitors paid a long distance visit to the Sheffield two day slope soaring meeting, where, in spite of the tearing wind on the first day keeping most models firmly boxed down, they were witness to some excellent multi glider aerobatics. Their story, which appears in the current edition of 'Seadog', tells of a dramatic change of conditions on the second day, in which a com-

plete absence of wind kept the multis grounded, but gave the Singles a chance to show their paces. By the way, that multi demonstration was mainly the work of the West Mendip flyers, perhaps the foremost exponents of multi glider in the country. The newsletter asks the question, 'How long can free flight survive?' However, the gloomy prognosis underlying this question was confounded by the f/i turn out at the Odiham Gala, where no less than 68 glider entrants returned scores. From this it would seem that free flight has plenty of future. Space is, of course, the problem, but, remember that R/C and C/L also require plenty of elbow room, particularly as a considerable degree of isolation is required, 'Far from the maddened crowd'. But free fliers beware. Ashdown Forest and other hairy pastures are highly combustible during the dryer (?) months - so watch those d/t fuses.

Contrary to the hopeful free flight outlook given by the Southern Area Gala, report from the Scottish Aeromodelling Association News-sheet tells of an almost complete swing to Radio, with a mere flutter of C/L and not a sign of a free flier anywhere. Contests for all groups going ahead, nevertheless. In a reference to the Greenlaw Symposium a black mark is given to the Trade for not braving the adverse conditions in order to give the visitors a flying display. It was left to private enterprise, in the guise of two spirited, uncommercialised radio flyers, to give visitors the much looked for airborne entertainment. Even so, an excellent Show, although more action, in the form of working displays and continuous flying, is recommended for future such events.

Amazing the number of clubs which continue to give flying displays in spite of all we hear about C/L being in the doldrums. A Priday, P.R.O., of the Bolton M.A.S., informs us that his club has several display bookings for the summer. He also tells us that a possible flying site for free flight has been looked at by the committee, and the authorities are to be approached. Wish them luck. The Bolton club has now settled down to a solid 30 membership, having sloughed off all the useless hangers on. From this active residue sufficient support was forthcoming to run a r.t.p. comp for 6s. 6d. Keilkraft kits. Points were given for Rate, Speed and Duration. Senior winner, Roy Clark, and Junior, Philip Clark.

Again more news of displays. This time from Wharfedale M.A.C. A report from Harold Yates, P.R.O., gives news of the special appointment of John Rhodes as display Team Manager, the more effectively to cope with the increasing number of displays. This was just one matter dealt with at the recent A.G.M. Another was the delicate matter of club subs. A proposal that these should be raised to £8 per annum, with 10s. credited per monthly meeting attended, even got the thumbs down from the millionaire faction. Idea behind the staggering suggestion, though, had some feasibility, as there was a feeling that something should be done to discourage people from joining merely to obtain flying facilities but without any intention of participating in club life. Part of that club life was a talk given by Scale expert, Eric Fearnley, who discussed the pros and cons of Radio Scale flying.

The London Area News Sheet to hand is a very personalised report, but who is the writer? Perhaps were he to sign himself on he would get more of that club information which, he laments, is so unforthcoming. Like ourselves he always gets a fulsome report from a particular C/L club whose star is very much in the ascendant just now (no prizes for guessing which), but little else. Why not unbutton a bit, you London clubs? At least the writer has the virtue of being an active flyer himself, for it was in that capacity he attended the St Albans Thermal Soaring Contest. He was greatly intrigued, feeling this, at least, was common ground where both R/C and F/F flyers could meet in a mutual interest.

Since the demise of the much admired N.A.N., *The Message*, the newsletter of the North Western Area, has taken over as the foremost Northern magazine. It certainly acquits itself well of its prime duty of covering all Area

SMAE CONTEST PROGRAMME

August 10th (PL)	Team Power	Keil Trophy
(5th Area) (C)	F.A.I. Rubber	Gutteridge
centralised)	A/1 Glider	
August 17th	All Scale Meeting	F/F, R/C, C/L
		R.A.F. Little
		Rissington
		7 Flights in
		2-hour rounds
August 31st	F.A.I. Rubber	
September 1st	F.A.I. Glider	
(F.A.I. Centralised	F.A.I. Power	
Contest.	F.A.I. Control Line	
pre-entry)	(provisional)	
	Open Rubber	Caton Trophy
September 14th	C/L Team Trials for	
	1970 World Champs.	R.A.F. Upwood
		Farrow Shield
September 14th (PL)	Team Rubber	S.M.A.E. Cup
(6th Area) (C)	F.A.I. Glider	
centralised)	1/4 Power	
September 28th	R/C and C/L Meeting	R.A.F. Upwood
(C)	= Senior and Junior Championships events.	
(PL)	= Plugge Cup event.	

events with good reportage and full results, but chooses to be less controversial and universal than N.A.N. At the April Area meeting, we are told, talk centred on airfield availability. Delegates finished up congratulating themselves on having the luxury of five possible flying venues to choose from. The issue includes a few notes from Basil Menges on the '68 World C/L Champs, culled from world sources. Point worth taking up is his summing up of the High Aspect/Low Aspect Ratio position. H.A. is easier to fly, better for ground handling and for fast, run in type, landings. L.A. gives better weight/strength ratio and is faster, but stalls easier - a fault that can be used to advantage if you can manage a stalling, shakedown landing for that quick pit stop.

A Mr. J. Giehler, of Long Island, New Jersey, writes to us for information concerning the Fylde R.C.M.S., which was duly forwarded. In his letter he deplores the professionalism that has swamped model flying in the United States, and warns that the same thing could happen here if we allow multi-propo to dominate the model scene. I see what he means: the preservation of the model aircraft as a sport/hobby project against its purely commercial role as the modern, electronic super toy.

It's bad enough when that rotund vandal, the earth, gives your favourite model the treatment, but you don't expect the human type to smash up your clubhouse. However, such is the much lamented fate of the Ashington D.M.A.C. (Northumberland) who now more or less keep open house for the youthful vandals who infest that otherwise quiet corner of England. Not all the Northumbrian youth take up vandalism as a career; a few are developing into promising model flyers. Understandably, with the young in heart the main interest is Combat. Recently six members built two each of the club design *Swoop* on mass production lines. Economic costing at 17s. 2d. per brace of models. Successful production, too, with the R/C section, which has successfully tested the homebuilt R.C.M.&E. equipment. Unfortunately, the future of the Radio Section is overclouded by the imminent closure of R.A.F. Acklington. Challenge given to any club within striking distance of Ashington for an informal Combat contest. Contact Robert Dixon, P.R.O., 30 Townsend Crescent, Kirkhill, Morpeth, Northumberland.

And that's about all I can squeeze in this month. Happy flying.

THE CLUBMAN.

ENGINE TEST *continued from p.425*

curve climbed more steeply and to a higher peak r.p.m. and, incidentally, a higher specific output. Actual and specific outputs were 0.105 b.h.p. at 11,500 r.p.m. and 0.65 b.h.p./litre for the 099-S, as against 0.145 at 13,000 and 0.73 b.h.p./litre for the 12. Even after allowing for the necessary correction for fuel and atmospheric conditions, the 12 shows a worthwhile improvement.

The Fuji is, by no stretch of the imagination, a 'contest' engine. It is essentially a 'sport' type motor, reasonably priced and aimed strictly at the 'fly-for fun' kind of modeller. However, where the power of

the 099-S might be marginal for certain models intended to be powered by engines in the 1 1/2 c.c. group, the above figures do indicate that the 12 has the advantage of a substantially improved output at virtually no increase in engine size and weight. Anyone faced with making a choice between these two engines might profitably bear these points in mind.

Power/Weight Ratio (as tested with silencer): 0.45 b.h.p./lb.

Specific Output (as tested with silencer): 73 b.h.p./litre.

RADIO 4-2

What is RADIO 4-2?

This is the code name for a new series of articles that will introduce simple inexpensive radio control of a variety of models to MECCANO MAGAZINE readers.

Why call it RADIO 4-2?

Because it is primarily intended to appeal to a team of two persons (radio for two!) which will usually be a father/son or similar combination; and secondly to be introduced as a series of two part articles.

But isn't radio control frightfully expensive?

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We don't know a thing about electronics!

If you can tell right from left, and black from white, you should be able to cope.

And we've never made a model anything...

Don't worry! Whilst the keener people can make nearly everything, less expert operators can buy ready-to-fit parts at specially cheap 'package-deal' prices which we are arranging.

NOW READ ON...

Starting in August issue of MECCANO MAGAZINE there will be a series of six

extra supplements that put over the RADIO 4-2 project in a nutshell. Part 1 will cover introduction to very simple radio control for boats. It offers left/right rudder with the option of engine control. Power unit will be an electric motor.

The scheme will be explained with tables showing available equipment of various makes and current prices.

Then in Part 2 (September issue), comes a drawing for the boat (a 22½ in. long hull with choice of superstructures) with step-by-step instructions for building. You can make it all, or a ready-to-use hull will be available for a few shillings.

Continuing the story, Part 3 in October deals with radio installation in a model aeroplane. Again tables of equipment readily obtainable with prices, details of how to fit and operate. Everything made absolutely clear to the very beginner—so step in bravely! Part 4 in November issue provides the fullsize working drawing to make a suitable good looking, reliable aeroplane that you can fly by radio control. Again there will be specially provided parts to help in the work at a MECCANO MAGAZINE readers' special price.

Part 5 in December issue will deal with radio for a model car. All the step-by-step information will be provided for installation and operation of equipment based on a typical 'racing car' outline. Part 6 to end the first series will have the working drawing of the playground Grand Prix car. A similar 'package deal' will assist in pro-



viding parts and body for those who would rather have ready made—or you can do the lot yourself.

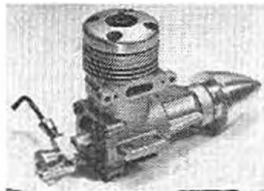
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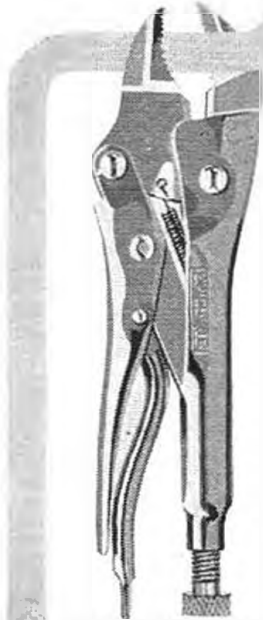


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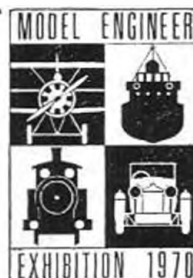
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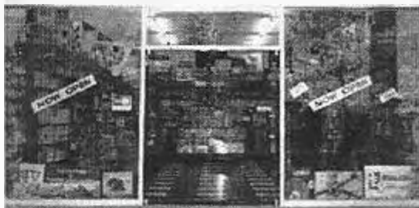
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