AERO MODELLER

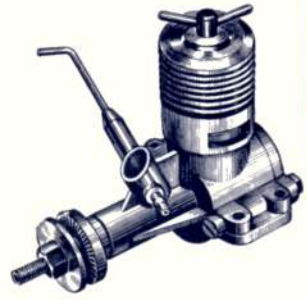
JUNE 1959

40th Anniversary of first non-stop Atlantic flight
Story & super detailed plans

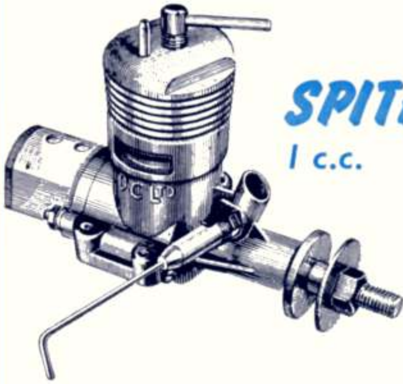
1'6

BAMBI ·15 c.c.

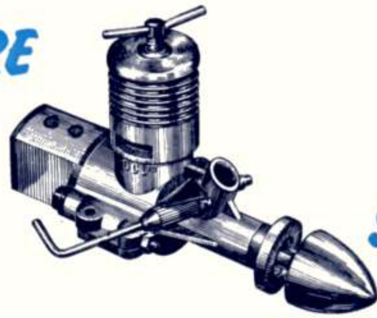
DART ·5 c.c.



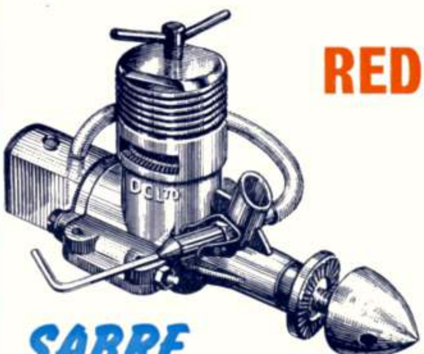
STANDARD MERLIN ·8 c.c.



SPITFIRE 1 c.c.



SUPER MERLIN ·8 c.c.



SABRE 1·5 c.c.

RAPIER 2·5 c.c.

REDUCED POST-BUDGET PRICES

Thanks to the good offices of the Chancellor of the Exchequer aeromodelling becomes that little bit cheaper. The reduction of Purchase Tax lowers the cost of all Davies Charlton engines, the new prices for our diesel aero engines being given below. A full price list for all our products can be seen at your local model shop.

BAMBI	£3.15.6
DART	£3. 2.8
STANDARD MERLIN	£2. 2.8
SUPER MERLIN	£2.11.4
SPITFIRE	£2.11.4
SABRE	£2.11.4
RAPIER	£3.17.9

Mr. Retailer *Send for our new Post-Budget Price List*

Engineered to last a modelling lifetime by **DAVIES CHARLTON LTD.**
HILL'S MEADOWS DOUGLAS, ISLE OF MAN

DIESEL or GLOWPLUG
STANDARD or RACING

KEILKRAFT supply the fuel

Following the outstanding success of KeilKraft Nitrated Diesel Fuel, the suppliers have now extended the range to include fuels suitable for all model diesel and glowplug engines. All these fuels contain BP ENERGOL Lubricating Oil and are supplied in tins with quick-fill spouts.

KEILKRAFT model engine fuels

KEILKRAFT NITRATED DIESEL FUEL

The best fuel for standard diesel engines. It contains a proportion of BP Energol Two Stroke Oil which reduces fouling and acid corrosion to a minimum. **Price : 3/- (10 oz.), 5/- (20 oz.)**

KEILKRAFT RECORD POWERPLUS

A highly nitrated diesel fuel suitable for racing and high-performance engines. It is blended with BP Energol Racing Oil and gives high output with good flexibility. **Price : 3/6 (10 oz.)**

KEILKRAFT RECORD METHANEX

A nitrated glowplug fuel for standard engines. It contains BP Energol Racing Oil and 3% Nitromethane. It can be used alone or mixed with KeilKraft Record Super Nitrex in racing engines. **Price : 5/6 (20 oz.)**

KEILKRAFT RECORD SUPER NITREX

A high-performance glowplug fuel for optimum performance in racing engines. It contains 30% Nitromethane and *must not* be used alone in new engines. It should be blended with KeilKraft Record Methanex to suit individual engine requirements. **Price : 4/9 (10 oz.)**

blended with BP ENERGOL Lubricating Oil

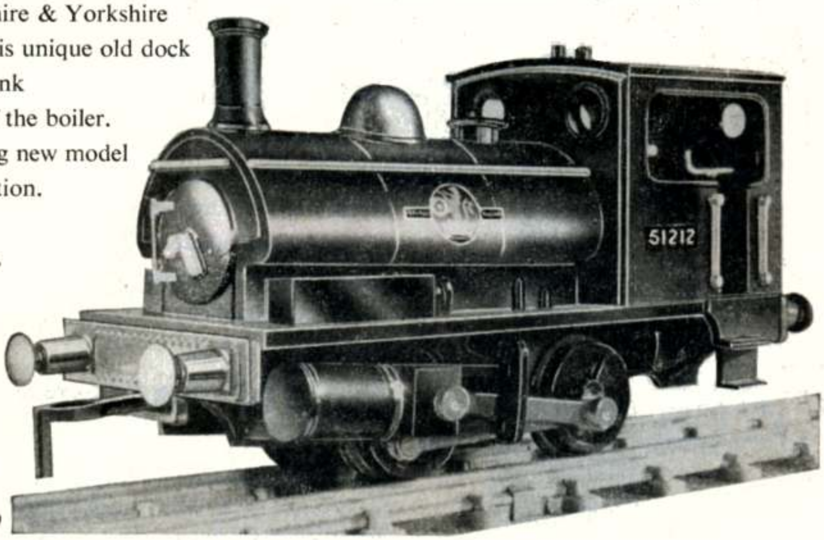
KEILKRAFT model engine fuels are distributed by : E. Keil & Co. Ltd., Wickford, Essex.

Add this new model to your

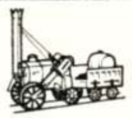
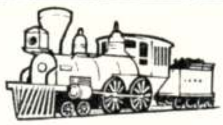
KITMASTER COLLECTION

A new model every month—that's Kitmaster! And only Kitmaster gives you authentic models of the world's most famous railway engines. This month it's the Saddle Tank. First used on the Lancashire & Yorkshire railway in 1891, this unique old dock shunter has its water tank saddled over the top of the boiler. Add this interesting new model to your collection. In all good model and toy shops *now*.

No.6 SADDLE TANK—4/6



HAVE YOU MADE THESE EARLIER MODELS?

 No.1 Stephenson's "Rocket" 4/6d.	 No.2 Diesel Electric Shunter 4/6d.	 No.3 Early American "General" 6/6d.	 No.5 Schools Class "Harrow" 7/6d.

ROSEBUD
Kitmaster
PLASTIC SCALE MODELS

Authentic models with moving parts.

Can be used on OO and HO gauge tracks

A new model every month!

ROSEBUD KITMASTER LIMITED

KCM2

Whatever your speciality

You'll get a far better finish—far quicker— with NEW FORMULA HUMBROL PLASTIC ENAMEL

Quick drying, diesel-proof, new formula Humbrol does the work of colour dopes—gives flying models a prize class finish too! The range of gloss and matt colours enables maximum realism to be achieved on all types of models.

NEW FORMULA
HUMBROL
PLASTIC ENAMEL
is available in 34 colours—
matt and gloss

½ oz tins 8d. Sizes up to ½ pint
Handy multiple painting kits 3/- -12/11
from all good model shops and
hardware stores.

- *superb for Balsa, aircraft tissue, polystyrene, metals and glass*
- *dries in 1 hour*
- *lead free in most colours*
- *dual purpose: replaces colour dopes*
- *proof to diesel fuel*
- *lighter in weight*
- *consistent matching shades*
- *long lasting*

HUMBROL

A product of the paints division
THE HUMBER OIL COMPANY LTD.

MARFLEET, HULL, ENGLAND.

the SOLARBO BALSA STORY continuing

This is one of a series of articles written by John Paterson, Managing Director of Solarbo Ltd., all about Balsa Wood and its many applications in aeromodelling and other industries.

. . . BALSA AT LOW TEMPERATURES

LAST MONTH I wrote of balsa wood retaining its physical properties remarkably well at the low temperatures associated with liquid gas storage. It does not become brittle and it does not lose its strength. The other thing that was found about balsa in contact with these liquid gases was that although they are liquid they do not penetrate through balsa wood in the way that water will do.

That in itself is not an entirely true statement; liquid nitrogen will not penetrate, liquid methane will not penetrate, but liquid propane will penetrate. Methane, you will remember from a previous article, comprises about seventy per cent. of the whole of natural gas.

It is all to do with the critical temperature which I have spoken about before in this series. What I think in fact happens is that with methane somewhere inside the balsa wood you get gas forming which becomes in effect an actual gas-barrier. This is capable of resisting penetration of the liquid gas.

However, in a ship you cannot take any risk of failure of the structure and whilst balsa wood is far and away the strongest insulating material, it is nothing like as strong, obviously, as a metal. It is therefore now quite clear in everyone's mind that the construction must incorporate an inner tank of either stainless steel or aluminium as the first barrier to a liquid gas, next coming the balsa wood as the insulating material (at the same time incorporating a second strength barrier), and finally the outside ordinary steel casing to the tanks for the main strength.

You see, the Cleveland disaster that I mentioned in an earlier article showed how quickly a break-up could occur if the cold really penetrates to the main strength part of the structure—that is, the outer shell. If you did not have an inner case, and the balsa wood cracked, the liquid gas could find its way through to the outer shell and due to the sudden chilling you would get such localised stress at this point that failure would be almost a certainty.

The tanker METHANE PIONEER *tied up on February 20th at Canvey Island, Essex, with 2,000 tons of liquid natural gas for the North Thames Gas Board. The first cargo of its type to arrive in this way.*


PLANES!
add these new* items to your collection of models
built from REVELL AUTHENTIC KITS
Models of unparalleled realism for you to build
with every history-making feature
reproduced in miniature by Revell.
Great fun to assemble.
And they make a terrific display.
Got all of these?
1 Boeing B.52 now 8/6
* 2 USSR Bison now 8/6
* 3 Liberator B-24J with alternative RAF Markings now 8/6
* 4 Airacobra P-39 now 7/6
5 Piasecki YH-16A now 8/6
6 Boeing B.29 now 8/6
Not illustrated
Skyrocket D-558-2 now 6/9
Skywarrior A3D now 8/6
Hercules C-130 now 8/6
And there are many more to choose from.
Send 6d. in stamps for 16 page Revell Collectors Catalogue.
Revell Authentic Kits
MANUFACTURED IN GREAT BRITAIN
REVELL (Great Britain) LTD MAIDSTONE HOUSE 25/27 BERNERS STREET LONDON W1

V-bombers airborne – 4 mins flat!

Suddenly, in the crew room — alert! Only 4 minutes later, 4 Victors are airborne. Britain's highly mobile V-bomber force must be ready for any emergency.

A full life...flying with the
Royal Air Force

Climbing now, at 4,000 feet a minute. The expert eyes of the Navigator/Plotter scan the green image on the radar screen for landmarks far below . . . 'Course 090'. Even now, 200 miles from the 'target', the Navigator/Radar prepares for his bombing run.

The Air Electronics Officer alters the frequency on his radar jamming set. He is responsible for equipment with enough power to light a palace. Above him, up the cabin ladder, is the flight deck. Here, Captain and Co-pilot sit side by side. The Captain, a Flight Lieutenant of 27, has well over 1,750 hours of flying experience behind him.

Each member of this crew is hand-picked; each very confident of the others' special abilities. And, indeed, the R.A.F. will look to officers like these for its future top-ranking leaders. Their experience will be needed — in administrative, liaison and training posts, and, perhaps, in high command. A long way since their training days . . .

Could *you* make the grade as an R.A.F. aircrew officer?

For details of how to apply, and of pay,* conditions and allowances, write to the Air Ministry, Department M.9 (AM6), Adastral House, London, WC1. (Applicants must be between 17½ and 26 and have gained a good GCE or equivalent.)

**A Flight Lieutenant of 25 can earn, with full allowances, nearly £1,700 a year.*

Three types of Commission: (1) Permanent, leading to a pension. (2) 12 years, with the option to leave after eight years, and the chance of gaining a permanent commission. (3) 5 years, also with the chance of gaining a permanent commission.

TAPLIN TWIN

British Patent No. 747742

THREE-BEARING CRANKSHAFT ALL BALL-RACES

See Test Report: A.M. MAY

£25 CASH PRIZE WILL BE PAID TO THE FIRST TAPLIN TWIN USER TO WIN A BRITISH NATIONAL CONTEST IN 1959 WITH A TAPLIN TWIN POWERED MODEL. ANY NATIONAL S.M.A.E. COUNTS. TRY YOUR LUCK AT SCAMPTON. AUTHENTICATED CLAIM MUST BE MADE.

Demand has been terrific, but you too can own a TAPLIN TWIN if you send off coupon below at once, together with your cheque or money order. Independent customer appreciation and test report should convince you, but needless to say, if you are not completely satisfied that it matches description we will gladly refund your money—but send off at once for prompt delivery.

WHAT THEY SAY!

". . . so revolutionary . . . all the miniaturised attributes of a powerful car engine.—C.E.B., Dorset." ". . . low speed and quietness deceptive . . . with reliability never found in a glowplug motor.—E.H.C., Croydon." ". . . delighted with same.—J.W.J., St. Helens." ". . . extremely fine workmanship.—A.S., London." "We congratulate you for a job well done.—A.C.W., Los Angeles." ". . . How pleased I am with the engine.—H.F.C., Guildford." ". . . pleased with looks and workmanship.—D.C.B., Swindon." "There is one snag—it is so good I now require a couple of engines myself!—G.B., Stoke."

VITAL STATISTICS

Capacity: 7 c.c. (6.92 c.c. actual). Weight: 15 oz. Engine bearers: Fixing holes 1½ in. centres laterally and longitudinally. Max. height 3½ in., max. width (excluding throttle toggle arm) 2⅜ in. Recommended prop. 13 x 8 Recommended waterscrew: 2¼ x 2¼ (3-blader).

Birchington Engineering Co. Ltd.

BIRCHINGTON, KENT Tel.: THANET 41265/6

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

I enclose cheque/money order value ....

NAME ....

ADDRESS ....

....

Watercooled ... TAPLIN TWIN Price **£9.16.0** inc. Flywheel, universal coupling, P.T., Post & Pkg.

£8 . 10

Inc. P.T., POST & PKG.

ROLAND SCOTT

THE MODEL SPECIALIST 147 DERBY STREET BOLTON, LANCS.

★ ★ ★ ENGINES ★ ★ ★

Fox .099 1.6 c.c. Glow ...	60/–
Fox 15 2.5 c.c. Glow ...	70/–
Fox 35 6 c.c. Glow ...	175/–
Fox 59 10 c.c. Glow ...	250/–
Veco 19 3.2 c.c. Glow ...	135/–
Veco 29 5 c.c. Glow ...	175/–
Veco 35 6 c.c. Glow ...	175/–
Cox Thermal Hopper ...	80/–
Enya 15 2.5 c.c. Glow ...	84/–
Enya 19 3.2 c.c. Glow ...	91/6
Enya 35 6 c.c. Glow ...	149/6
O.S. Pet 1.6 c.c. Glow ...	58/9
O.S. 15 2.5 c.c. Glow ...	112/9
O.S. 35 6 c.c. Glow ...	134/–
Enya 60 10 c.c. Glow ...	215/6
Rivers Silver Streak 2.5 c.c.	130/–
P.A.W. Special 1.5 c.c. ...	88/6
P.A.W. Special 2.5 c.c. ...	130/–
Eta 19 3.2 c.c. Glow ...	139/8
Eta 29 5 c.c. Glow ...	146/4
Taplin Twin 7 c.c. Diesel ...	172/–
Mills P .75 c.c. Diesel ...	59/8
Mills S .75 c.c. Diesel ...	65/7
E.D. Bee 1 c.c. Diesel ...	54/9
E.D. Fury 1.46 c.c. Diesel...	77/10
E.D. Racer 2.46 c.c. Diesel	79/–
E.D. Hunter 3.46 c.c. Diesel	80/11
Allbon Bambi .15 c.c. Diesel	78/6
Allbon Dart .5 c.c. Diesel	64/5
Super Merlin .76 c.c. Diesel	52/7
Allbon Sabre 1.49 c.c. Diesel	52/7
Allbon Rapier 2.5 c.c. Diesel	79/11
Allen Mercury 1 c.c. Diesel	58/6
Allen Mercury 1.5 c.c. Diesel	59/6
Allen Mercury 2.5 c.c. Diesel	68/6
Allen Mercury 3.5 c.c. Diesel	71/8
Frog 150 R 1.5 c.c. Diesel	55/–
Frog 249 Modified ...	94/9
Frog 349 BB 3.5 c.c. Diesel	81/8
Frog 500 5 c.c. Glow ...	75/–
Webra Piccolo .8 c.c. Diesel	75/–

★ CONTROL LINE KITS ★

K.K. Demon "A" T.R. ...	30/–
K.K. Talon Combat ...	25/6
K.K. Spectre 2.5 c.c. Stunt	38/5
Frog Condor 1.5 c.c. Stunt	30/–
Mercury Lightning ...	58/9
Lightning De Luxe ...	75/6
Mercury Monarch Stunt ...	36/–
Mercury Toreador Combat	26/9
Lynx Stunt Bipe	25/8
Frog Gladiator Combat ...	29/6

★ FREE FLIGHT POWER ★

K.K. Halo 42" .5-1.5 c.c. ...	21/–
Aeronca Sedan 65" ...	72/6
New Junior 60"	54/–
Calypso 50" Contest ...	21/6
Calypso Cub 34"	14/6
Veron Deacon 52" ...	34/6
Mercury Tiger Moth 33"	34/2
Frog Tutor 38" 1 c.c. ...	24/6

★ ★ GLIDER KITS ★ ★

Contest Inchworm 64" ...	21/6
Contest Empress 72" ...	29/6
Magpie 24" Beginner's ...	4/10
Martin 40" Intermediate ...	9/10
Swan 48" Contest	12/6
Chief 64" A2 Contest ...	22/–

SECOND-HAND ENGINES

Allbon Dart .5 c.c. ...	40/–
Elfin 2.49 PB	42/6
Allen Mercury 3.5 c.c. ...	47/6
E.D. Racer 2.46 c.c. ...	47/6
McCoy 29 Stunt	75/–
E.D. Hunter 3.46 c.c. ...	45/–
Miles 5 c.c. Diesel	100/–
Allen Mercury 10 ...	40/–
E.D. Comp Special 2 c.c. ...	35/–
Eta 29 Series IIIC ...	75/–

Full List forwarded on request. Second-hand Engines, if in good condition, will be taken in part exchange for any modelling goods.

★ RADIO EQUIPMENT ★

★ RECEIVERS ★

E.D. Boomerang and Escapemen Ready Wired	128/11
E.D. Airtrol	145/–
E.D. Mk. IV 3-Reed ...	233/6
E.D. Everest 6-Reed ...	355/–
Ripmax Pathfinder ...	119/6
R.E.P. Unitone	147/6
R.E.P. Tritone	233/–

★ TRANSMITTERS ★

E.D. P.C.1	119/6
Ripmax Pathfinder ...	99/6
E.D. Mk. IV Complete ...	189/9
E.D. Everest Complete ...	228/9
R.E.P. Unitone	181/10
R.E.P. Tritone	189/–
Triang Radiomaster ...	130/–

★ R/C ACCESSORIES ★

E.D. Mk. III Escapement ...	23/1
E.D. Clockwork Escapement	58/8
F.R. Clockwork Escapement	47/6
E.D./Taplin Actuator ...	75/10
Ripmax Mactuator... ...	23/10
Mini Uniac Actuator ...	53/6
Standard Uniac Actuator ...	45/–
Telescopic Aerial 9½"-5' ...	21/–
R.E.P. ½-oz. Relay ...	24/–
Ripmax A30 Relay ...	18/6
E.D. Polarised Relay ...	30/–
0-5 M/A Meter	20/–
6-Reed Tuned Relay ...	60/–

Also: Venner and Exide Accs. All Batteries, Wire, Switches, Valves, Plugs, Reed Banks, Potentiometers and All Spares.

★ AMERICAN R/C EQUIPMENT

I can now obtain most American Units including Orbit, Babcock, Citizenship, Bramco, C.G., Deltron, Details ahd Prices on Request

★ ★ ★ TO ORDER ★ ★ ★

Home: List your requirements and forward P/O or Cheque. I WILL DO THE REST C.O.D. service available

Overseas: Orders are forwarded Free of British Tax and payment can be made by cheque. Notes, Money Order, Dollar Draft, or Exchanges for Modelling Equipment from your country.

★POPULAR ACCESSORIES★

Celspray Airsprays ...	9/6
Thimbledrome Handy Reels	38/4
D.C. Test Stands	12/11
E.D. 246 and 346 Jet Assmbls	6/–
Fuel Filters	2/6
Class "A" Pilots 2/5 "B"	3/1
Elmic Limitanks	7/9
Finest Jap Silk ... sq. yd.	6/–
10 c.c. and 15 c.c. T.R. Tanks	3/3
Mercury Pressure Tanks ...	5/5
K.L.G. Miniglow Plugs ...	7/10
K.K. 3" Airwheels ...	25/–
K.K. 4" Airwheels ...	30/–
Varipitch Prop	6/11
Altmaster Altimeter ...	25/–
Speedmaster Speedometer	32/6
Xacto Burlington Chest ...	103/–
Wood Carving Sets 27/6 &	46/3
Balsa Stripper 5/9 Plane	7/9
Engine Bolts per packet	5d.
Ever Ready Electric Motor	10/3
Light Laystrate C/L Wire	3/4, 4/9
Elmic Universal Timer ...	15/–

Solarbo Balsa, Truflex, P.A.W., Frog and Stant Props, Spinners, Wheels, Dope, Cements, Tissue, Fuel, Transfers, Brushes, etc., etc.

I can supply spares for all Allbon, Elfin, E.D., Mills, A.M. and Frog Engines from stock.

★ ★ ★ **HIRE PURCHASE TERMS are available on all purchases over £2. Send for lists and simplified agreement form** ★ ★ ★

Another winner by FROG

"349" DIESEL

Designed with the special features required by control line Combat and Radio/Control enthusiasts—easy starting, high power output, wide speed range, clean running, etc.

Additional features include the following refinements:

★ **Rear rotary induction**
★ **Loop scavenged porting**
★ **Positive ratchet type fuel needle**
★ **Vibration-proof compression screw**
★ **Provision for intake. Throttle and Exhaust Pipe**
★ **Crash-proof crankshaft and crank case**
★ **Available with Ball-race or Plain bearing**

Ask to see this new FROG motor at your Model Shop

349 BB Ball-race version 79/2 (*inc. P.T.*)
349 D Plain bearing version 73/3 (*inc. P.T.*)

"349" MARINE

Fitted with new type water jacket having no soldered joints. Special flywheel mounted over bearing housing reduces vibration. The "349" Marine is sold complete with flywheel ball and socket universal joint. **Price £5/3/2** (*inc. P.T.*)

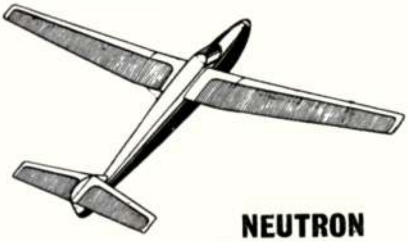
For the best performance use Frog "Power-mix" fuel specially made by Shell-Mex Ltd.

Made in England by
INTERNATIONAL MODEL AIRCRAFT LTD.
MORDEN ROAD, MERTON, S.W.19

ADVANCED DESIGN — THE BEST MATERIALS — TOP PERFORMANCE

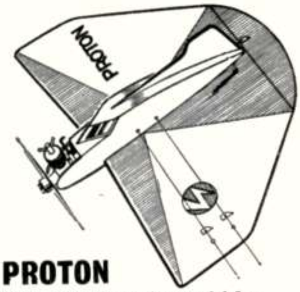
PERFORMANCE KITS

Specialists In Advanced Aerodynamic Design



NEUTRON

36-in. span semi-scale high performance sailplane. The kit includes only the finest selected matched strip and sheet, pre-cut ply tongue, coloured tissue, transfer, super detailed plan and instructions. **Price including P.T. 8/9**



PROTON

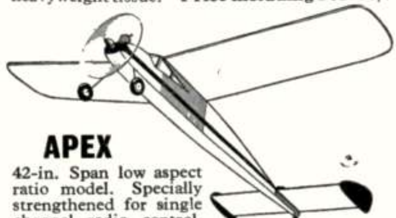
27-in. span fully aerobatic combat model for 1-3·5 c.c. engines, featuring exclusive cellular wing construction. Contents include Die-cut fuselage sides, elevator, and all ply parts; transfer, and coloured heavyweight tissue. **Price including P.T. 16/7**

HORNET MOTH

20-in. Span scale model featuring alternative area tailplanes for exact scale, or free flight purposes. Kit includes coloured tissue, plastic airscrew assembly, rubber, etc. **Price including P.T. 7/4** each

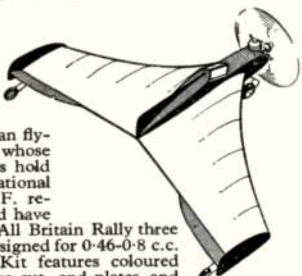
ASTEROID

25-in. Span cabin duration model, capable of an excellent performance even under windy conditions. Contents include superior plastic airscrew, detailed instructions, plastic wheels, coloured tissue, "Performance Kits" transfer, etc. **Price including P.T. 7/4**



APEX

42-in. Span low aspect ratio model. Specially strengthened for single channel radio control, or free flight with 0.75-1.5 c.c. engines. Kit features two colour tissues, 2-in. sponge wheels, and pre-cut ribs, fins, etc. **Price including P.T. 31/11**

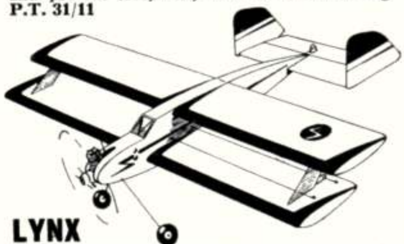


ION

34-in. Span flying wing, whose prototypes hold four National and R.A.F. records, and have won the All Britain Rally three times. Designed for 0·46-0·8 c.c. engines. Kit features coloured tissue, pre-cut end-plates and elevons and three 1½-in. sponge wheels.
Price including P.T. 29/-

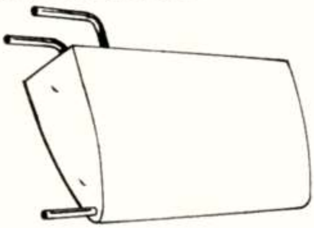
COSMIC CLOUD

33-in. Span semi-scale sailplane which combines beauty of line with strength, and a very pleasing performance. Contents include super detailed plan, coloured tissue, and "Performance Kits" transfer, etc. **Price including P.T. 6/4**



LYNX

26-in. Span stunt/combat biplane, which is capable of executing the new A.M.A. stunt schedule. It is designed for 2.5-3.5 c.c. motors or 1.5 c.c. for sports flying. The kit features clearly die-cut wing ribs, fuselage sides, doublers, and all ply parts, ready shaped trailing edges, pre-cut tailplane and elevator, coloured heavy weight tissue, fibre bell crank, transfer, etc. **Price including P.T. 24/8**



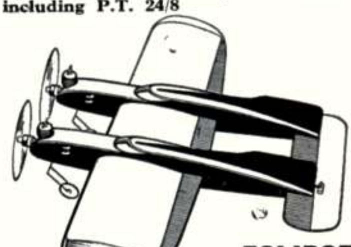
PERFORMANCE KITS STUNT PRESSURE BAFFLE FUEL TANKS

Small	6/4 each	4/11 *
Medium	7/4 „	5/4 *
Large	7/4 „	5/4 *
Giant	8/9 „	7/4 *

* Denotes similar tank with straight vents and no baffle.

GLO-CHIEF 29. and .35	**£6/ 8/9**
GLO-CHIEF 0.49	**£8/11/4**
TAIPAN 2½ c.c. diesel	**£4/16/0**
TAIPAN 1½ c.c. diesel	**£3/17/0**
DAVID ANDERSON "DRABANT" B.B. 2.5 c.c.	**£6/7/2**

Strato plastic coated wooden props in all popular sizes from **2/7 - 3/6**



ECLIPSE

41-in. Span twin engined fully stuntable model developed over nine years. Extremely stable on either engine. Suitable for engines of 1-3.5 c.c. Plan and instruction book only. **Price 7/10**

Distributors for: **E.D., SOLARBO, R.M.** *Sole Importers and Distributors for* **GORDON BURFORD & CO. LTD. and DAVID ANDERSON ENGINES**

PERFORMANCE KITS, 61 Four Pounds Avenue, Coventry

Telephone: 72401

LEPAGE'S Bond-Fast P.V.A.

Now in general use throughout Great Britain "Bond-Fast" has particular advantages for air-frame construction. Due to its deep penetration into all types of wood it has the tremendous joint strength of 3,000 lbs. per sq. in., and is equally effective on balsa or hardwood. It is clean to use and dries without trace, saving several ounces of weight on a large model. It is slower drying than cellulose cements, which enables the more difficult building operations, such as sheet covering, to be carried out more easily. Its water-resistant properties also make it ideal for model boat building, and the plastic squeeze bottle makes it convenient and economical to use.

Why not buy a bottle now?

No. 21 2 oz. Plastic Bottle 2/3
No. 22 4 oz. Plastic Bottle 3/6
No. 23 8 oz. Plastic Bottle 5/6
No. 121 12 oz. Refill Bottle 6/6
No. 122 20 oz. Refill Bottle 8/6

Available at your local Model Shop

LEPAGE'S LIMITED · BECKENHAM · KENT

MERCO

BRITAIN'S GLOW-MOTOR

Supreme

Here is the engine power modellers have been waiting for—The MERCO glo plug. Built to an up-to-the-minute design from the finest materials, every characteristic of the engine is outstanding. Easy handling and freedom from vibration makes the Merco suited for radio and control line stunt work. The high power output and flat power curve makes Merco highly suited to a whole range of different airscrews for different types of models.

A clean beautifully finished production, with a contest winning performance.

4.75 ccs.
Height above bearers $2\frac{7}{16}$ in.
Weight: $6\frac{1}{2}$ ozs.
B.H.P.: .55
Distance between bearers: $1\frac{1}{4}$ in.

29
£5·19·6d
including P.T.

Discerning modellers will appreciate the high performance of the Merco the Glo-motor supreme.

5.75 ccs.
Height above bearers: $2\frac{7}{16}$ in.
Weight: $6\frac{1}{2}$ ozs.
B.H.P.: .65
Distance between bearers: $1\frac{1}{4}$ ins.

35
£5·19·6d
including P.T.

ASK TO SEE THE *MERCO* AT YOUR LOCAL STOCKIST

Manufactured by:
MODEL ENGINE RESEARCH CO. LTD.,
1A BALFOUR MEWS, EDMONTON, N.8
Sole Distributors:
HENRY J. NICHOLLS LTD.,
308 HOLLOWAY ROAD, LONDON, N.7. Tel: NORth 4272

Heard at the Hangar Doors

AERO MODELLER

Editorial Director D. J. Laidlaw-Dickson

Advertisement Director C. S. Rushbrooke

Editor
R. G. MOULTON

Editorial and Advertisement offices:
38 CLARENDON ROAD, WATFORD, HERTS.
TELEPHONE: WATFORD 32351 (Monday-Friday)

VOLUME XXIV
No. 281 JUNE, 1959

CONTENTS

AEROMODELLER Incorporates the MODEL AEROPLANE CONSTRUCTOR and is published monthly on the 15th of the previous month by the Proprietors:

MODEL AERONAUTICAL PRESS LIMITED.

SUBSCRIPTION RATE: (Inland) 23/-, (Overseas) 22/- per annum prepaid including the special Christmas Number.

Chance for Fledglings

FINANCIAL BARRIERS are, we know, the greatest deterrent to aviation interests, particularly so for budding pilots among the thousands of aeromodellers. Now the Air League of the British Empire is giving one fortunate enthusiast the benefit of a "Flying Scholarship", to be named after Robert Perfect, late vice-Chairman of the Air League Council.

The competition for the Annual Scholarship, which will comprise up to six weeks flying and ground tuition at Airwork's school, Perth, for this year, is open to any British subject between 17 and 21. Entry fee is only 2s. 6d. and the award will go to the author of the best essay on a specific subject relating to the Air League. Some of our more voluble correspondents should do well in such an admirable contest, and we commend all who yearn for a career in the air, or for a Private Pilot's Licence, to send for full particulars of the Robert Perfect Scholarship to the Air League, Londonderry House, 19 Park Lane, London, W.1.

In addition to the scholarship, the Airwork School of Aviation is making a further offer to continue training of the student to Commercial Pilot's Licence standard at a specially reduced fee, saving as much as £254. Such an opportunity must surely appeal to aeromodellers.

Classic Fare

This month we have a unique variety of content which is the result of many months' research and experiment by a number of contributors. Space limitations prohibit revelation of the full stories behind, for example, Doug McHard's free-flight twin-engined models and the hitherto unconsidered importance of slipstream effect on wing-mounted engines, or Ron Warring's fascinating discoveries in use of glow engines with diesel fuel. The reader can absorb the benefit of these expert findings to save himself those countless hours of experiment and this applies even more so in the case of "Galloping Ghost" proportional radio control. In the short space of one year, Charles Riall has become the foremost exponent of wagging tail technique in this country and although he does not enter National competitions, his demonstrations at A.R.C.C. and West Essex club meetings have justly earned his expert reputation. For one thing, wind means nothing to C.R. and his "Rattler". When all else is grounded by the worst of weather, his familiar red and white model takes the air for flight after flight, including all the varieties of loop, roll and spirals in its repertoire, and usually terminating in a taxi back to master's feet after a series of touch and go landings. Flights rarely exceed 100 feet altitude and his pylon turns are impeccable. For these reasons, and the fact that we believe this "poor man's Multi" to be a method of control worthy of support (many consider it superior to Multi-channel), Charles has been given a full say this month and we urge all who fly R/C to read and digest every word he has written, for it will surely be a standard "G-G" reference for the future.

The Vickers-Vimy flights across the Atlantic and to Australia will be officially commemorated in June and December this year. Aer Lingus have announced their design for a memorial to be unveiled at Clifden on the 40th anniversary of Alcock and Brown's flight, and George Cox's superb details of the aircraft will provide a timely reminder of that great achievement, a scene from which is so dramatically portrayed by Ken McDonough on the cover. George reminds us that the first aircraft to fly the Atlantic was the Curtiss NC4, but that flight was made via the Azores and had the backing of all the U.S. Navy resources, including a chain of 27 destroyers spread over the route. To Alcock and Brown went the greater glory for the first *non-stop* crossing in a landplane.

New Shape

The Gull wings of the twin pusher Piaggio P166 8/10-seater executive are to be a common sight in Britain. Based at Luton, G-APSJ will be showing off its graceful maroon and cream lines on MacAlpine business and our heading photo opposite shows this first British registered P166 soon after arrival on its delivery flight.

Hans A. Pfeil

One of aeromodelling's most ardent protagonists died on April 5th in Germany. He was responsible for so much progress in his country (pylons for free-flight, early control-liners, use of balsa, etc.) and built up so much international goodwill in post-war years through his prolific multi-lingual correspondence, that we are sure Hans Pfeil will remain a legend among modellers everywhere. Acting as a self-appointed publicist for the hobby and manufacturers, he was responsible for practically all the modelling news that came out of Germany over the past ten years and we valued Hans highly as our correspondent in that country.

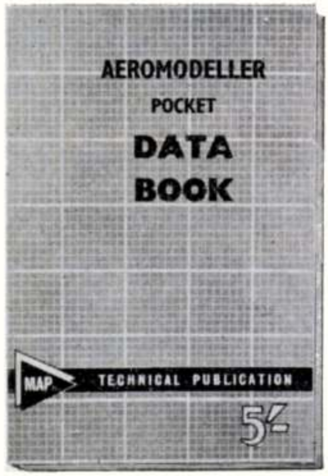
Those beautifully-produced kits and plans now sold in Germany with additional instructions in English will always be a memorial to his great work, often undertaken when so physically weak that we and his friends have marvelled at his good humour and fortitude. To the last he maintained a constant flow of letters, never failing to amuse although the inevitable end was fast approaching at his early age of 37. His endurance was an inspiration and his work an example to all who had the pleasure of corresponding with him. We know that all modellers will join us in extending sincere condolences to his wife and two children.

Fund raising in U.S.A.

An overwhelming response from the U.S. model trade in answer to an appeal by the Hobby Industry Association of America will enable 50 State Champions to fly for an all-expenses-paid week at Los Alamitos, California, for the U.S. "Nats.". Each State (including Hawaii and Alaska) is to run a championship from which the highest scorer qualifies and to cover costs fund contributions total $20,500. At picture, right, Bill Effinger (Berkeley) and Nat Polk (Polk's Hobbies) are seen turning over contributed cheques worth $12,000 to H.I.A.A. President and Treasurer. The Association visualises this sponsorship of 50 State Champions as a means of making the general public more Model Aviation conscious than ever before. To us it seems they have long-sighted vision that is bound to pay dividends in the future.

Indispensable Reference

Latest addition to our M.A.P. Book range is one which will have a universal appeal and has been specially produced in pocket size edition for handy reference. In fact, the full title is "AEROMODELLER Pocket Data Book" and its 64 pages cover subjects ranging from chuck glider to multi-channel radio. Sketches always convey more than solid words, and, at a guess, we'd say there are almost a thousand clearly-drawn illustrations in this volume, dealing with constructional data, covering, trimming for flight, radio or control-line installation and even how to draw elliptical or parabolic plan forms. For 5s., the Data Book offers a complete aeromodelling course: it can give one an idea of how to cure a warp, or fit that wing, build a "quickie" or mount an engine. Copies can be ordered now through your Model Shop, Bookseller, or direct from Model Aeronautical Press at Watford (adding 6d. for post and packing).



International News

Following a special F.A.I. Models Commission meeting in Frankfurt during April, announcements have been made concerning this year's World Championships.

A/2 Glider in Belgium at Reustem on August 23rd/24th and Wakefield in France at Brienne Le Chateau (Aube) on July 18th/20th is official news at last. Regrettably there is no news of a host country offering its services for the Power event, so for 1959 the International calendar will have a conspicuous gap. We expect that a lot of people will want to have their say over such an omission: but from now on the password for International campaigners ought to be "First get your host—*then* run the event".

Tailless International takes place at Kalten-Kirchen, Holstein, Germany, on June 13th/14th, and the "King of the Belgians" R/C International at Hirzenhain in Germany, about 60 miles east of Aachen.

Expert's Forum No. 6

Galloping Ghost

proportional radio control

by

CHARLES RIALL

Seen at right with prototype "Rattler" (Mills 1.3 diesel) which has intrigued many London Area modellers

EXPERIMENTS with this system were inspired by the article in AEROMODELLER for July, 1957, and subsequent articles in *Model Airplane News* for July, August and September, 1958, showed that others were arriving at much the same conclusions, but detail solutions to the various problems were different.

These notes are based on experience gained during 1958 with the system installed in a modified three-quarter scale "Smog Hog" and in a 6-ft. span glider.

Considerations of the System

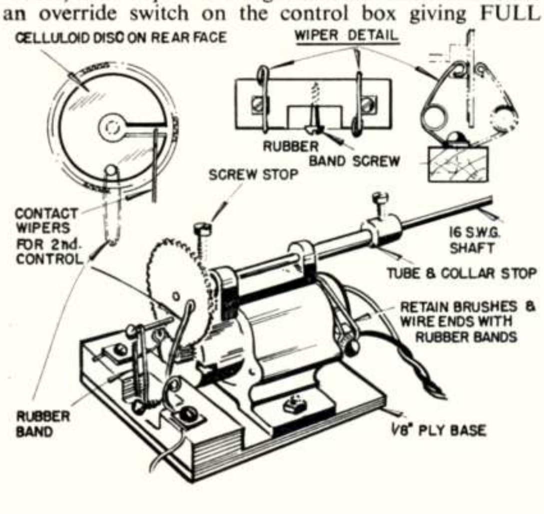
1. Fast pulse for UP elevator would be desirable to give more positive pull-out from a dive, but if the crank were arranged at the top to achieve this, rudder control would give a DOWN elevator tendency and this was thought to be undesirable, although it has apparently been done in America. The author has always used an arrangement with the crank at the bottom on fast pulse.

2. Apart from the control of rudder and elevator through the pulse system, in theory there is also the possibility of a steady signal or no signal for a short period causing the "Mighty Midget" to rotate in either direction. This would give two more channels of communication provided that the rotation can be made to produce a result in a very short time and the reactions of the model due to control movements are not too violent.

At first a simple mechanical device was made to operate an engine cut-out, but the effect on the flight path was found to be too violent and unintentional engine control was likely to occur during normal violent manoeuvres.

If control movements are reduced to obviate this, the system becomes much more critical and the attractive simplicity and wide tolerance to change in all the variables, such as battery voltage, is lost.

It was then decided to attempt engine control by other means, to fit stops at 270 deg. crank movement and to use an override switch on the control box giving FULL Signal/NO Signal for flying effects only.



Installation in the Model

Before the system is built into a model, it is strongly recommended that a mock-up be made with the same length of drive shaft and representative control surfaces. This can all be of odd balsa, etc., and mounted on a wooden plank. It allows relative positions of control surfaces, hinge lines, etc., to be varied until an optimum arrangement is achieved.

In the "*Rattler*" installation, elevator and rudder hinge lines are in the same plane and the drive shaft centre line is $\frac{7}{16}$ in. above the centre line of the tailplane and elevator. This distance should be kept small.

The "Mighty Midget" servo is bolted to a piece of $\frac{1}{8}$ in. ply ($1\frac{3}{4}$ in. x $1\frac{3}{4}$ in.) with nuts Araldited below the ply. The ply is cemented to a block of plastic sponge approximately $1\frac{3}{4}$ in. x $1\frac{3}{4}$ in. x $1\frac{1}{2}$ in. high. (The plastic should be well pre-cemented.) This allows easy removal of the motor for brush and bearing inspection.

The plastic sponge is then cemented to the bottom of the fuselage in a similar manner. The motor can be packed up or angled as necessary to get good alignment between the two drive shaft bearings on the motor and the tail bearing and the sponge mounting will also assist in permitting self-alignment.

This arrangement is very satisfactory in flight, but quite uncrashworthy and to allow for this a very strong bulkhead is built *across* the fuselage at the height of the motor mounting and positioned about $\frac{1}{8}$ in. forward of the mounting and a piece of sponge is cemented to the bulkhead in the gap.

If the drive shaft is rather long a steady bearing can be arranged between the motor and the tail to damp out possible vibration and whip. For this purpose another piece of sponge is used 1 in. x 1 in. x $\frac{1}{4}$ in. thick and a hollow rivet or tube about $\frac{5}{64}$ in. internal diameter cemented in the centre. The sponge is then cemented to suitable supports across the fuselage. This complete arrangement allows very severe crash loads to be absorbed without much damage or mal-alignment occurring. The tail bearing should have good clearance, about $\frac{1}{64}$ in., and a hollow rivet inserted from the rear with the rivet head cemented to the stern has been found to be satisfactory.

On the "Galloping Ghost" servo, a ·001 *mfd.* capacitor is made up with each wire soldered into a loop and is placed across terminals. Several small rubber bands are used to hold brushes in place and to hold wires against motor body to keep vibration loads away from soldered ends. This allows inspection of brushes without unsolder-

Left: The basic control unit is a converted Mighty Midget motor oscillating to drive the tail control shaft. Pin on gear wheel for centring is not to scale and should be approx. 5/32 in. from shaft axis and preferably bushed with tubing to prevent rubber band wear

ing any connections and guards against vibration loosening brush holders. Control driving shaft is made from 16 s.w.g. piano wire (·064 in.) in place of $\frac{1}{16}$ in. "Mighty Midget" shaft and can be reduced in diameter slightly with emery paper to take the brass M.M. gear. A collar on the shaft prevents forward movement.

At the tail end, the shaft is just bent and not formed into a crank, but it will continue to be called a crank. Use of a true crank in this location is really a throw-back to the requirement for winding up an elastic driven excapement. A simple bent shaft is much better for the reasons that (*a*) it is so much easier to alter the degree of movement by altering the bend in the shaft; (*b*) if the bend is in line with the rudder hinge line the rudder movement each way will equal the degree of bend (about 25-30 deg.) and is easily judged; and (*c*) the crank will always pass at right angles through the rudder "loop" and therefore allow small clearances to be used to obviate backlash without the danger of binding even though the degree of rudder movement is altered. Likewise but to a slightly lesser degree for elevator.

There is little advantage in experimenting with rudder only at first, since operation of the elevator as well will affect pulsing rate, adjustment of pulser unit, etc., and simultaneous rudder and elevator is the whole point of the system.

Control surfaces should be made as light as possible; the less inertia the better. The rudder "loop" can be a simple U-bent-wire cemented to the rudder. The elevator "loop" can be the only connection between the two elevator halves, but should be easily removable, since spacer washers between "loop" and elevator can produce different elevator trim.

The elevator should be approximately neutral when the crank is 45 deg. from bottom dead centre. This is important and is the datum for the elevator movement.

The "Mighty Midget" is made in such a way that if the rubber band peg is fitted to the M.M. gear directly opposite to the screw hole in the boss and if a longer 8 BA steel screw is used, this screw will contact the motor casing each side after approximately 270 deg. movement.

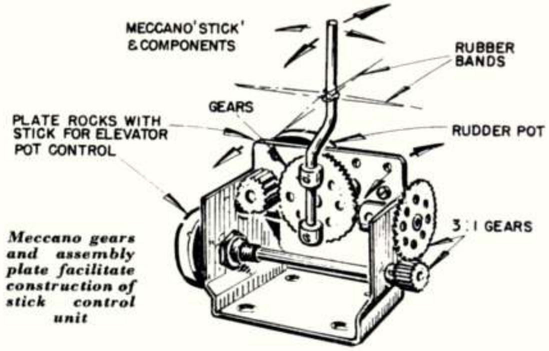
PULSER UNIT

The pulser unit was made up in accordance with the amended circuit in August, 1957, AEROMODELLER. A 7,000-ohm Manning Carr relay is used and is arranged so switch on Tx when armature is released, sparking at the points is suppressed by 100 ohms and 0·5 mfd. (this teemed best when checking in the dark). The Pulser relay should be adjusted with the Tx switched on so that the erlay points are actually switching the Tx.

It is a good idea to arrange a meter socket in the H.T.+ side of the circuit (the socket can have a separate switch, a 2-pin plug or can be across one side of a modified double pole slide switch). By plugging in a milliammeter with a variable resistance, about 10,000 ohms, in series, it is possible to reduce the H.T. current until the pulsing stops and this check gives an indication of the battery power "in hand" and relay adjustment.

Elevator and rudder potentiometers are driven by *Meccano* gears giving 3 : 1 ratio. The gearbox was made from odds and ends, but is basically a *Meccano* plate 5 holes x 3 holes on which is mounted the rudder pot. and gear drive. The plate is secured to a *Meccano* rod which pivots in a frame and drives a secondary shaft to operate the elevator pot.

Neither the rudder or elevator pots. are necessarily used fully. The rudder pot. drive is connected up to give neutral rudder with stick central and the elevator pot. drive is connected to give full up elevator at about $2\frac{1}{2}$ cycles per sec. with stick hard back. With stick forward the pulse rate should be fast enough (7-8 c.p.s.)



Meccano gears and assembly plate facilitate construction of stick control unit

to give little rudder movement. An even faster rate can be used to trigger off an engine control escapement.

Stops should be arranged on the control box to act on the stick and NOT on the pot. movement and should be very strong for an excited(!) operator.

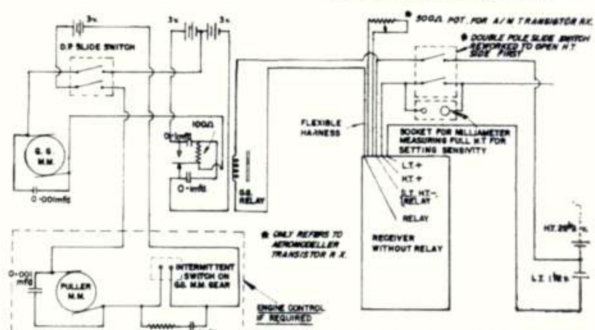
Strong rubber bands or springs should be arranged to centre the stick. The operator cannot see the degree of control movement he is applying since he must watch the model to assess the result and the amount of control applied is entirely governed by the reaction of the model. Under different conditions of wind, engine power, etc., the results of control application will vary for a given stick movement and the purpose of the springs is (*a*) to approximately centre the stick if it is allowed to go free; and (*b*) to act as a "feed-back" of information to the operator so that he can tell by feel what he is, in fact, doing at any given movement.

The ·35 microfarad capacitors will have to be made up with ·25 and ·1 in parallel. In practice the ·25 alone will give a rate which is nearly slow enough and if some value near ·1 is added and arranged to be permanently in circuit and a double-pole press switch is wired in to cut out the two ·25, an extra fast pulse rate can be obtained by pressing the switch with the stick fully forward. This will give neutral rudder and full down elevator, but can be used for engine control as described later, when operated for only a very short time. The switch should be positioned for operation by the left hand so that the right hand does not have to leave the stick: *this is most important*.

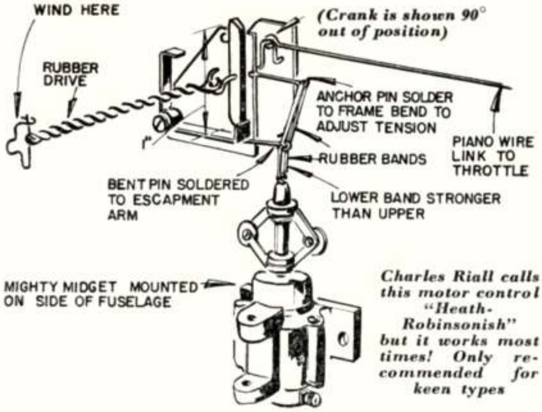
An additional control has been added to the pulser unit in the form of a two-way spring centre switch to give FULL signal or NO signal. This is mounted beside the control stick and wired to give left rudder and full up elevator when pressed to the left and *vice-versa*. The effect on the model is violent and quite exciting and should only be tried out at a safe altitude.

As long as the rudder flaps symmetrically with the stick neutral and the rate is about 4 c.p.s., it does not really matter if the effects of stick movement are non-symmetrical or non-linear. The operator soon learns to move the stick correctly by the reactions of the model. Large rudder "flap" to one side naturally gives an up elevator effect, but this is by no means undesirable.

(*continued on page* 258)



R.X. AND G.G. INSTALLATION (SINGLE CHANNEL)



Charles Riall calls this motor control "Heath-Robinsonish" but it works most times! Only recommended for keen types

ENGINE CONTROL (using single channel radio)

It is recommended that this should not be tried until a model has been successfully flown with the ordinary G.G. system.

The author being mechanically rather than electronically minded, engine control has been added to the G.G. system by the following rather tricky device, suitable for modellers with plenty of patience.

A celluloid disc about $\frac{1}{32}$ in. thick is cemented to the rear face of the *Mighty Midget* large gear. A slot about $\frac{1}{8}$ in. wide with bevelled edges is cut in the disc in a position to bring the slot horizontal when the centralizer peg (and the elevator, rudder crank) is positioned at the bottom.

A springy wire contact (silver wire was used) enters the slot and contacts the gear when the pulser motor is stationary at this position, but bounces across the slot when the motor is oscillating and thus only causes intermittent contact. This wire must be far enough toward the edge of the gear to clear the stop screw in the gear boss. A similar wire contact is permanently rubbing on the other side of the gear sufficiently far from the centre to miss the rubber band and peg. A 3-volt separate battery supply is switched by these contacts to a Mighty Midget motor which spins a centrifugal "Flyball" actuator.

When the G.G. motor is oscillating at both slow and fast pulse rates, the puller motor will only turn slowly as a result of the intermittent switching, but when the extra fast pulse rate is applied for a short time the puller will exert a considerable pull as the contact remains in the slot, touching the gear. The puller is used to trip a rubber-driven escapement which in turn operates a Mills throttle. The escapement can be made up in a comparatively crude manner and driven by strong rubber bands to provide a lot of power for operating the engine control.

A two-arm escapement gives fast and slow with intermediate speed as long as extra fast pulse is sent and the rudder is left at neutral, but during this time elevator is, of course, full down.

A three-arm escapement could be made to give FAST-SLOW-INTERMEDIATE-FAST. The extra-fast pulse should only be fast enough to nearly stop the G.G. system since, if a too fast pulse is used, there will probably be a tendency for the G.G. to stop away from the neutral position. This can be compensated to some extent by unequal values of the capacitors permanently in circuit and an opposite inequality in the switched capacitors. In any case, a little stick movement for rudder can be applied as the extra fast button is pressed to bring the G.G. neutral. The best method is to pull the stick back momentarily to give a nose-up effect and then push the stick fully forward just before the engine control button is pressed.

There are so many variables in the G.G. system that only experiment can sort this out, but this rather Heath Robinsonish arrangement has been operated in flight to give engine control with extra fast pulse for less than one second. The effect on the flight path was small in the present installation used which had only a small amount of down elevator, With large down elevator the effect would, of course, be more marked.

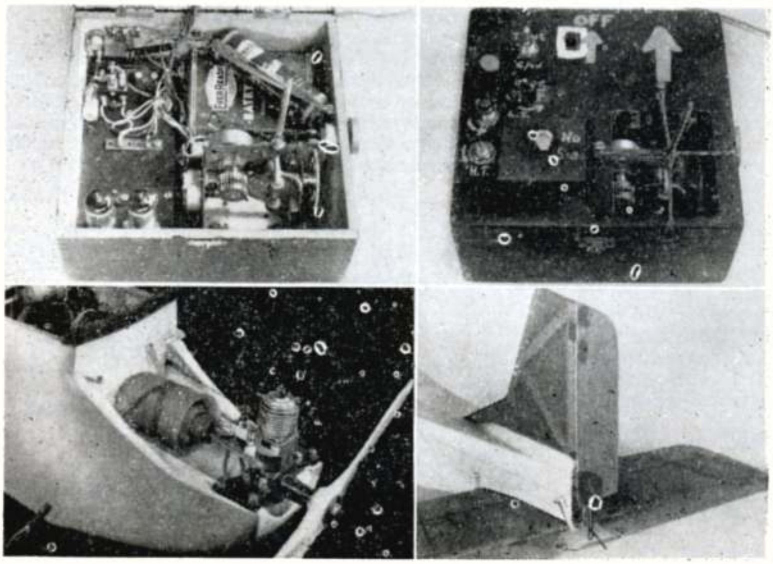
FLYING

The model has C.G. position at about 35 per cent. and longitudinal dihedral about 3½ deg. Rudder movement is about 25-30 deg. each way with crank at 90 deg. to B.D.C. Elevator movement is about 10 deg. down and 30 deg. up with Mighty Midget on the stops.

The system appears sensitive to elevator control but this may be partly due to the fact that change in pitch is harder to judge than change in direction. In any case, a more forward C.G. position is advised for initial flights.

Start with very little down elevator available either by suitable bending of the crank or elevator loop position. R/C glide tests are advised at first, but do not use too much elevator to try and keep the model airborne. On powered flights, if it is found that a lot of UP elevator is required to get the model airborne, *do not take off* or, if after a hand launch, *end the flight as quickly as possible*. When in this trim condition the model may appear to be

Continued on page 260

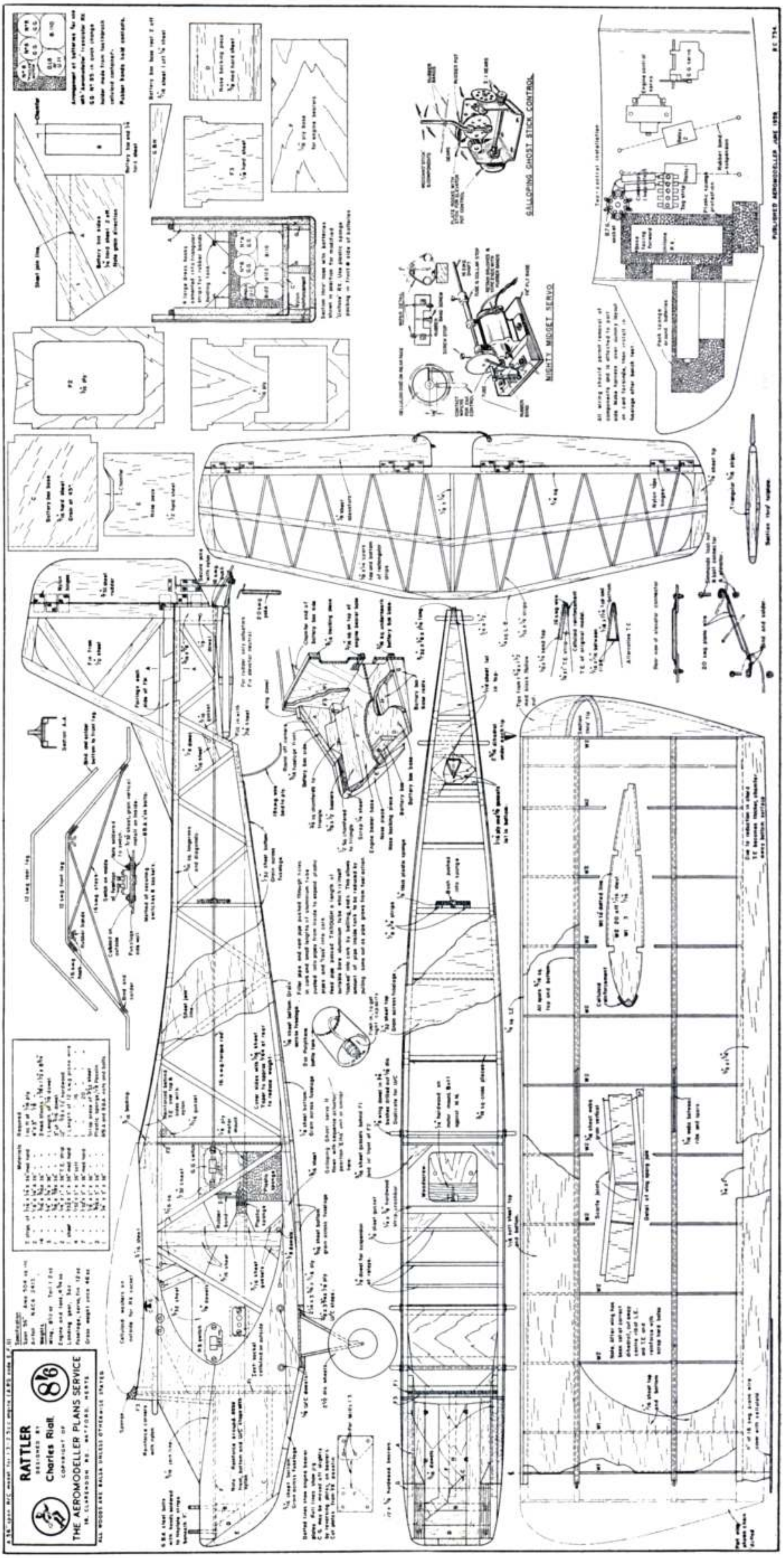


Inside and outside of Charles Riall's control box shows general layout and his various switches, etc., which have been adapted to suit his two systems of engine speed control described in the article. The D.18 battery is used for bench test only. Flying demands a larger L.T. battery. Below left: Mills 1.3 installed with polythene tank doubled back to adjust capacity. At lower right is the tail control system at neutral rudder with down elevator

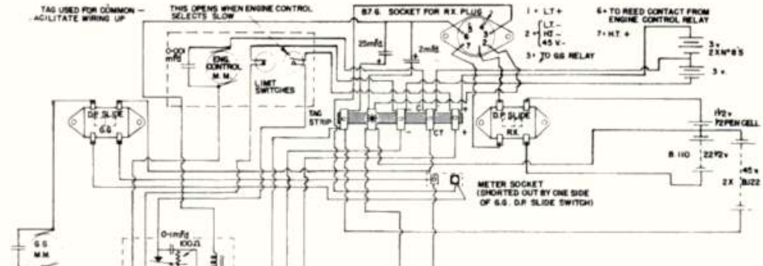
We believe the "RATTLER" to be the most advanced radio control model for "Galloping Ghost" proportional system yet seen in this country.

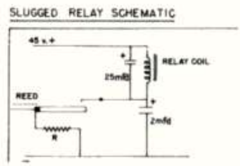
Most stunt manoeuvres are possible—plus a few exciting extras!

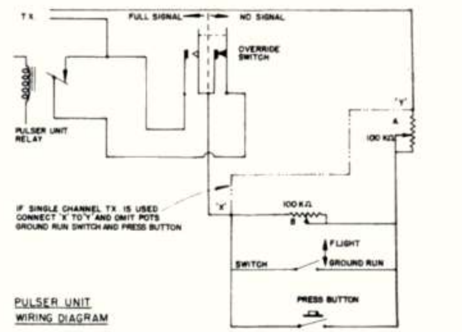
Recommended engine size for first efforts is 1.3 to 1.5 c.c. but it will take up to 2.5 c.c. engines



FULL SIZE COPIES OF THIS 1/16th SCALE REPRODUCTION ARE AVAILABLE AS PLAN RC734, PRICE 8/6d. PLUS 6d. POST FROM AEROMODELLER PLANS SERVICE.







Though complicated at first sight, above harness for model wiring is actually very simple to follow. Use of separate switches, tag strips and socket actually simplify installation. At right is the additional circuitry in the pulser unit control box

controlling reasonably well, but will then suddenly dive and fail to pull out since available UP elevator has already been used up. Correct by packing at front of tailplane to reduce the tailplane incidence.

The G.G. model won't fly itself. Plenty of piloting experience is essential before advanced manoeuvres are attempted. Be content with accurately controlled flight at first and then loops, stall turns and spins—inverted flight *may* come later; and don't take your eyes off the model! The degree of control in normal flight compared with escapement models more than compensates for the additional complication and the model is really *flown* all the time. Operation of the FULL SIGNAL/NO SIGNAL switch can produce a barrel roll in certain conditions. Failure of any part of the system is, of course, almost certain to lead to a crash but the author is of the opinion that a model in pieces in the vicinity is no worse than a model in one piece (perhaps) in the next county! Vibration affecting the relay may give a dive tendency and this happened several times before the cause was realised and the relay rubber-mounted. Also it is very easy to become over-confident, and, pitch attitude being hard to judge, a stall at low altitude can cause the model to fall out of the sky, particularly with such a low-powered model.

1959 EXPERIMENTS

The engine control described above tended to be unreliable in operation and could not be used close to the ground because of the dive tendency. A system was required to give engine control *completely* independent of the flying controls and this has now been achieved by using a UNITONE receiver specially modified by Radio and Electronic Products to drive a reed unit as well as the normal relay. The reed unit is inside the set and the G.G. relay and engine control relay are mounted separately in the model.

The reed unit operates a slugged relay which switches an actuator for engine control. After various experiments, the author decided that the best way to arrange the engine control was as follows:

Pulser unit has a press-button switch which is held ON by the left hand forefinger (left hand must hold pulser box easily without use of forefinger!) to give suitable pulsed HIGH note to excite highest reed. Only highest reed is used.

Pulsed operation of reed unit energises a slugged relay by a separate 45 v. supply. Two B.122 to give a separate 45 v. supply are considered preferable to adding any load to the H.T.

On a steady tone the reed will switch about 7 m/A through the slugged relay, but when pulsing on a large "space" to "mark" very little gets through and the relay should be set as low as possible—about IN at 1·2 m/A and OUT at 0·7 m/A. Using 45 v. is rather "brute force", but it seems that this voltage will be able to fall a long way before relay fails to hold in. Relay held IN retains a motor-driven two-position actuator to give FAST engine speed.

Whenever the press switch is released, the Tx transmits a pulsed *lower* note and reed unit pulsed excitation ceases (this also happens if Tx should fail or if NO SIGNAL switch is operated). The relay falls OUT after about half-second delay and the engine control goes to SLOW.

When engine is at SLOW a quick press on the button will give a burst of power without the delay or holding the button produces FAST again.

A slide switch on Pulser Unit parallels the button for starting and ground running which must, of course, be carried out with the radio link in operation. *Switch must be returned to* FLIGHT *before take-off* and button held in.

A characteristic of the Rx and this arrangement is that the pulsed tone on rudder selection by mark/space towards "space" (in the author's case RIGHT RUDDER) will fail to hold the engine control at FAST at long range *before* the G.G. flying controls fail.

A large change in tone between FAST and SLOW should be avoided since tone change affects G.G. pulsing Also, *always go to a lower tone for* SLOW since the pulsing of the Rx causes unwanted "twitching" of the reed unit when away from the chosen note and this is much worse when above the chosen note.

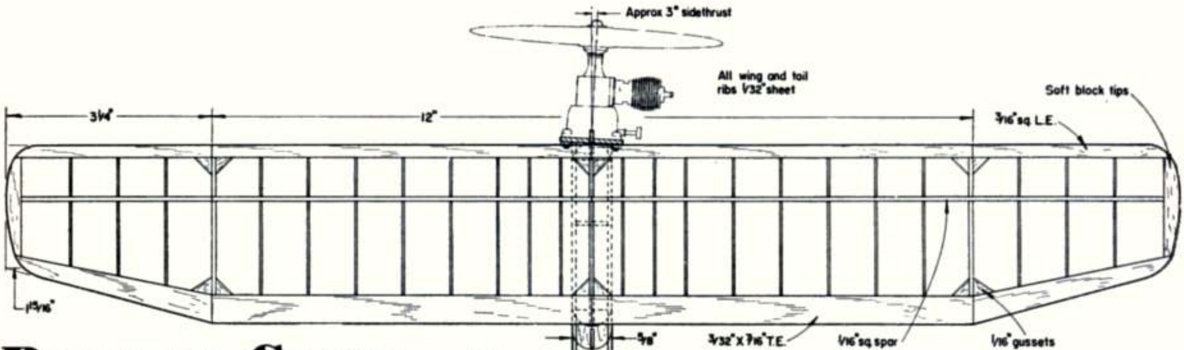
The motor-driven rotary actuator with limit switches for engine control is fed by the G.G. batteries and 3 v. feeding G.G. M.M. on "no signal" should drive engine control to FAST so that 3 v. supply driving engine control to SLOW under "no signal" conditions will only be feeding one M.M.

A twin battery feed to an engine control *rotary* actuator is recommended so that the ineffective crank angle simplifies adjustment and any unwanted effect from the reed unit just causes hunting on the limit switches rather than complete rotation of a step-selector type of actuator.

Many flight trials have shown this to be a most satisfactory method, it being "fail-safe" for both radio and human failings, since when disaster is imminent the human mind (the author's at any rate!) appears to be much more capable of releasing a push button than of pushing one. As far as the author is concerned, this is known as the "PRESS ON" system.

The additional FULL signal/NO signal control has now been mounted at the top of the control stick itself. This gives much easier operation. A second similar model has been built with an E.D. 2·46 c.c. Racer and the G.G. system controls it well, but it is thought advisable to gain first experience of the system on a slower model.

In the Mills 1·3-powered model a P.100 relay is used for the G.G. system, but trouble has been experienced in the "Racer"-powered model which was thought to be due to vibration on the P.100. A Siemens high speed relay (3,400 ohms) type 96 is now being used and appears to be more satisfactory.



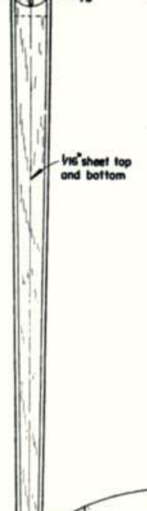
Pee-wee Creep

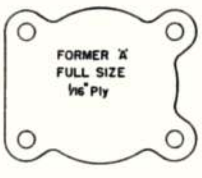
by Pete Muller

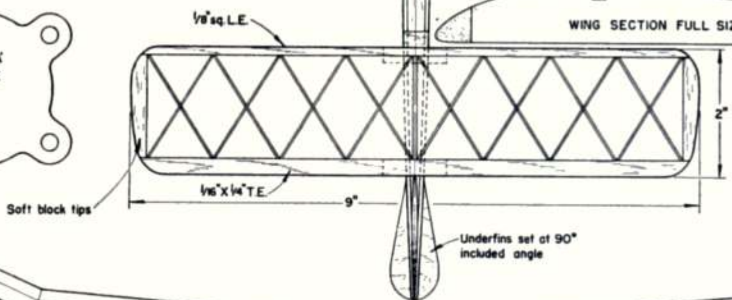
Despite its size, this tiddler is quite uncritical to trim; the original having a climb pattern which many bigger models might envy. Wash-in on the left wingtip (1/8 in.) together with right sidethrust, result in a vertical, right-rolling climb, and slight glide turn. Only a small amount of rudder should be necessary if the warps and sidethrust are correct. Balance just in front of the T.E.

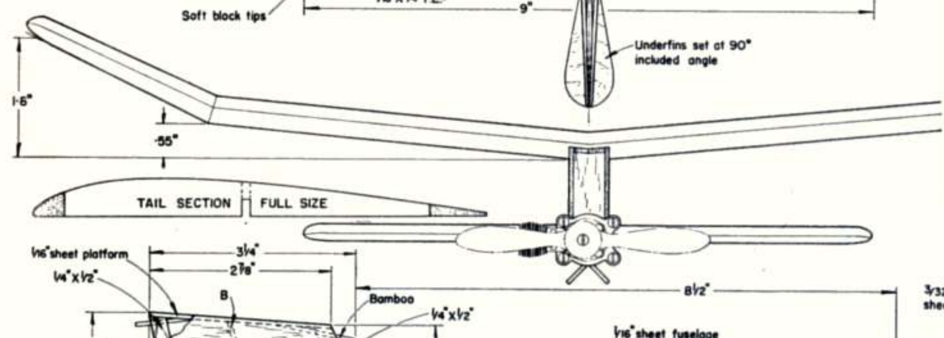
Construction is straightforward, but weight should be kept to the minimum as the glide on models of this size is very sensitive to wing loading. 1 3/4 to 2 ounces all-up weight is easily achieved by using light wood and only sufficient dope to tighten the covering; the necessary fuel-proofing also serves to weatherproof the model. Watch where it settles or you'll never find it! Here's what you need:—

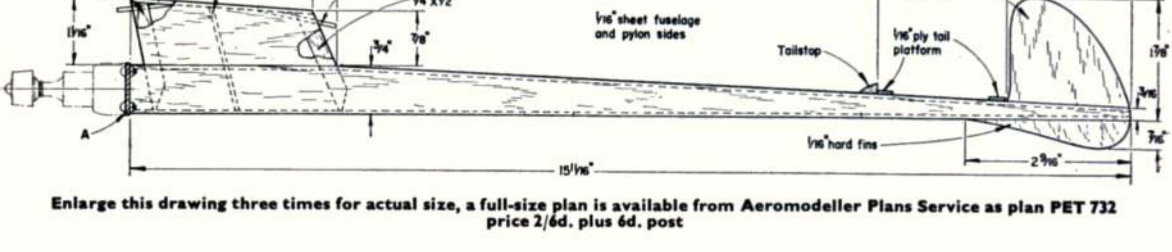
Sheet: 1/32 in. x 12 in. x 3 in. Medium/Soft. 1/16 in. x 18 in. x 3 in. Medium/Hard. 3/32 in. x 2 in. x 3 in. Soft.
Strip: 1/16 in. x 1/16 in. x 20 in. Hard. 1/8 in. x 1/8 in. x 10 in. Medium/Hard. 3/16 in. x 3/16 in. x 20 in. Medium/Hard. 1/4 in. x 1/4 in. x 12 in. Soft. 1/8 in. x 3/32 in. T.E. x 30 in. Medium/Hard.
Miscellaneous: 1 in. x 1 1/2 in. x 1/16 in. Ply. 3 in. x 3/32 in. dia. Bamboo. 3/4 in. x 20 S.W.G. Dural Tube. 2 1/2 in. x 20 S.W.G. Piano Wire.



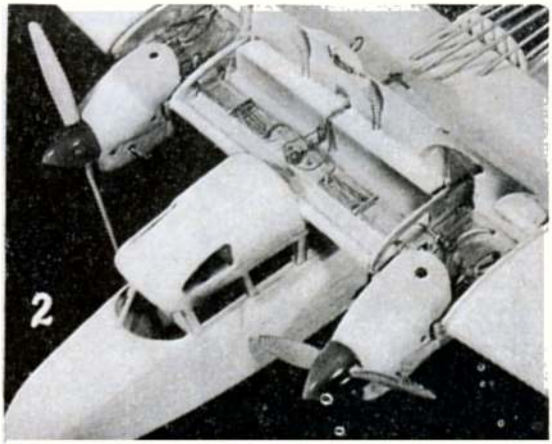


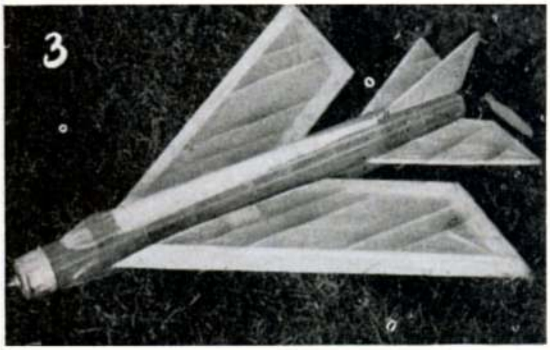






Enlarge this drawing three times for actual size, a full-size plan is available from Aeromodeller Plans Service as plan PET 732 price 2/6d. plus 6d. post





Model News

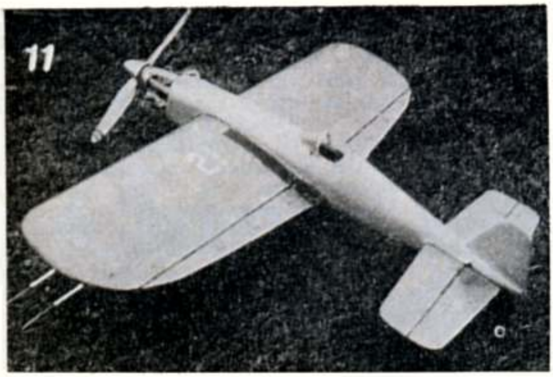
The Aero Commander on page 272 is by no means Doug McHard's first free-flight twin engine experiment. The picture above shows his first effort which was most successful apart from the fact that it always had to be flown on maximum power. In the close-up (**2**) we see the engine cross-bar mounting system which was connected via push rods to the rudder.

Two D-C Merlin diesels were fitted with sliding cradles, spring loaded, each affecting the rudder according to power. If one engine failed the cradle automatically cut out the opposite engine. Close-set engine nacelles were, of course, a great advantage in helping to correct minor power differences.

The charm of an airborne twin, desirable though it may be, still escapes even the most inventive modellers and we have yet to see one which is both practical and simple. Although we currently hear of a tail-engined twin in the Letchworth club and we know of several push-pull projects, the first to really succeed in producing a model for anyone to build will be given due publicity through Aeromodeller Plans Service. We might consider the flight lay-out of the Piaggio as in the "Hangar Door" heading, page 254. This full-size aeroplane flies single-engined with virtually no requirement for a change in trim.

Picture (**3**) shows a novel experiment by R. Newton of Yarm-on-Tees in the form of a semi-scale engine English Electric Lightning with a Merlin engine mounted at the tail-end driving a 7 x 4 pusher propeller. This gives one virtually a Delta lay-out already known to be very successful in A.P.S. designs and opens the field for semi-scale to a large number of contemporary jet fighters.

Many readers will recognise the handiwork of Captain Cesare Milani of South Kensington in the next set of pictures: (**4**) is a close-up of his Fiat CR 32, also shown in picture (**7**). This model, powered by specially-made Miles 10 c.c. petrol engine, is coloured in the scheme for the Spanish Civil War Cucaracha Squadron. Next is a S.E. 5a (**5**) to 1/8th scale for an Anderson Spitfire, which is fully aerobatic and will be seen at the Nationals;



and in photo (6) is his RO.41 for a Fox 59. All of the models have fully-equipped cockpits and are about 50-in. wingspan and in the case of the Italian designs are made from details in manufacturers' handbooks, so authenticity is guaranteed.

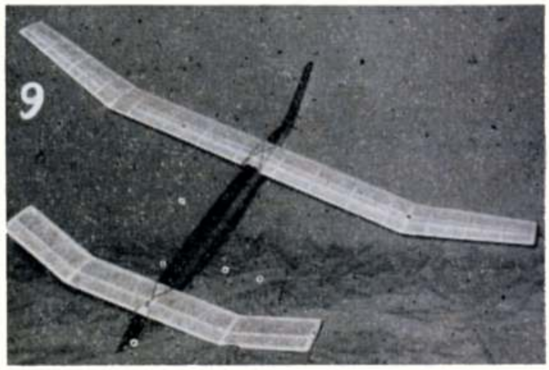
Another feature of Captain Milani's aircraft is the use of spring-fitted undercarriages to absorb landing shocks in true scale manner with collapsible struts. The Fiat CR 32 in particular has a beautifully-constructed all-metal undercarriage as can be seen in the close-up in picture (4).

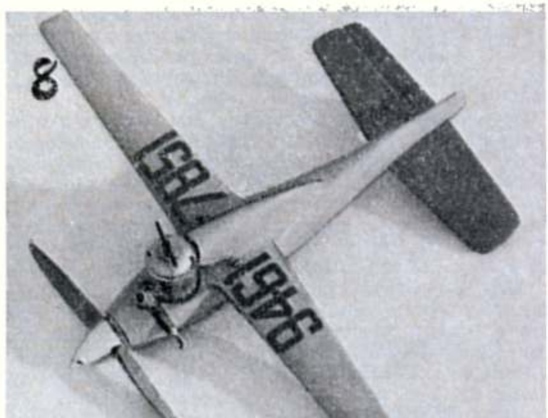
Speed models are not so common nowadays, but picture (8) shows one of a new model from Malcolm Wood and Martin Dilly of Croydon. It is 11-in. span in the Frog 150 R and is finished in Ford coral, an unusual choice of colour which will make a change on the flying field.

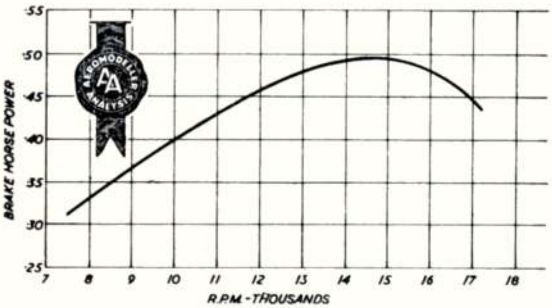
Another change in appearances is seen in picture (9) with Anthony Ericson's Canard A/1 glider, 42-in. span, and designed with the aid of our publication "Design for Aeromodellers". The foreplane has a vernier screw for incidence variation and wing construction employs a novel rib boom system much after the style of full-size practice.

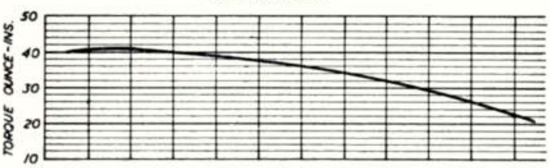
Yet another engine model appears in (10) where Stan Perry of Gloucester is showing off his Hannoveraner CL III free-flight for an E.D. Bee with independently-operated ailerons and rudder via pendulum control. The model has many interesting constructional features, not the least being that Biplane tail assembly!

Finally, in (11) an experiment from Flt.-Lieut. Kelly stationed in Gloucester. He wanted a small stunt model that would do the S.M.A.E. schedule in all weather conditions and so reverted to the old theme of high wing loading. The result was a 27-in., 170-sq. in. wing for the P.A.W. 249 special which rotates at 70 m.p.h. and will fly through most manoeuvres, but mushes when any attempt is made to go "square". Naturally the model is very tough but the heavy loading does restrict performance if one wants the ultimate in aerobatics.









Engine Analysis No. 60 BY R. H. WARRING

APART FROM DETAIL differences, most 5 c.c. plain bearing glow motors seem to look very much alike and follow the standard layout and design practice established in the United States. The Australian "*Glo Chief*" is no exception. Externally, and internally, it looks just as one would expect a motor of this size and type to look. Perhaps a little on the rugged side—which is certainly no fault—and weighing a matter of $7\frac{5}{8}$ ounces. Its outstanding feature is its performance—right at the top of its class for 5 c.c. plain bearing engines with a maximum B.H.P. of almost exactly 0.5 developed between 14,000 and 15,000 r.p.m. Even with this top performance it remains an easy enough engine to handle.

Running tests were conducted with a standard castor-methanol mixture with 20 per cent. added nitromethane. Performance is almost equally as good on a moderately doped fuel, in fact the compression ratio was a little on the high side for the "racing" fuel employed, giving a marked tendency to kick back. Hand starting was easy, however, right down to 7 in. diameter propeller sizes tried, provided the correct technique was established.

The "*Glo Chief*" appears to need a fairly generous prime for starting, in the right place. Priming through the exhaust, it was necessary to open the needle valve right up as well and start very rich. Otherwise the engine quickly cuts after running off the prime. Finger choking alone did not produce good starting response, but priming through the intake tube (with the fuel line already full) produced almost instantaneous starting with the needle valve at or near (slightly rich) running settings. Once having established this technique, the engine was run through a whole series of tests without any starting bother at all.

The "*Glo Chief*" ran consistently and well at all speeds tested ranging from 8,000 r.p.m. to well over 19,000 rp.m. It appeared happiest running at the higher speeds but still developed good torque down as low as 8,000 r.p.m. and was quite steady at that speed. At high speeds the exact setting of the needle valve for optimum lean mixture was a little critical. On several occasions, when apparently running smoothly and two-stroking, further adjustment of the needle by only a matter of two or three notches produced an increase in r.p.m. of as much as 1,000 on a given propeller load.

One could add the comment too, that in the case of the "*Glo Chief*" a substantial length of flame is sometimes blown out of the exhaust when starting very rich. Another peculiar habit (which appears to have evolved with modern glow motors) of spitting back raw fuel through the intake when flicking over, indicates the generous shaft porting. (With a forward facing intake the trajectory of this fuel usually coincides with the position of the operator's face.)

The torque curve shows that the high initial torque is well maintained, resulting in a substantially flat power peak. Anywhere between 12,000 and 17,000 r.p.m., in fact, the "*Glo Chief*" output is maintained at over .09 B.H.P. per c.c., which is a pretty good figure on its own for a glow motor to achieve as a peak. Overspeeding in the air would not result in an appreciable power loss, having selected a slightly undersize propeller in the first instance. Thus a 9 x 4 would probably make an excellent free flight propeller, although a 10 x 4 or 11 x 3 would be a more logical choice, slightly trimmed, if necessary. A 10 x 6 Frog nylon (or possibly even a 9 x 6), or an 11 x 4 wood propeller would probably be a good choice for radio control.

One of the main applications of the "*Glo Chief*", however, is undoubtedly for control line work where its excellent power characteristics should make it outstanding for stunt. We suspect, however, that it may be a little critical as regards tank location, particularly as the vibration level is rather high, especially around the 12-13,000 r.p.m. figure. Rather bad vibration is, in fact, about the only criticism we have to offer on performance.

Constructionally the "*Glo Chief*" features a substantial leaded steel cylinder (unhardened) which is a nice sliding fit in the crankcase unit casting. The cylinder is held by two bolts through the head (fore and aft positions) engaging in the crankcase, the remaining four head bolts merely screwing into the top cylinder fin to hold the head down without distortion. The cylinder seats on its lowest fin, sealing with a fibre gasket. The crankcase face is as cast. Large area diametrically opposed exhaust and transfer ports are cut in the cylinder walls. The transfer passage provided in the crankcase casting is of generous proportions and covers some 100 degrees (radially). The exhaust opening covers approximately 150 degrees (radial).

The piston is substantial in depth, but of extremely light Meehanite construction with the lower walls machined away very thin. The top is flat with a vertical plate deflector, machined as an integral part. The gudgeon pin of $\frac{5}{32}$ in. diameter is fully floating, whilst the connecting rod is machined (milled) from solid dural. Big end bearing is $\frac{7}{32}$ in. diameter, leaving a relatively small wall thickness at the bottom of the connecting rod. The piston, consistent with the soft bore, is of hardened steel.

The crankshaft is $\frac{7}{16}$ in. diameter over the $1\frac{1}{8}$ in. bearing length, stepping down to a $\frac{1}{4}$ in. diameter threaded length for the propeller shaft. The intake port is cut square with the hole down the centre of the shaft $\frac{5}{16}$ in. diameter. A crank web is machined away for counterbalance and bearing length and crankpin finished by grinding, the bearing itself being formed by a cast iron (or similar metal) sleeve press fitted into the crankcase unit, this bearing being finished by honing.

Gordon Burford's Glo Chief

Australian 29 with fiery performance

SPECIFICATION

Displacement: 4·92 c.c. (·30 cu. in.)
Bore: ·739 in.
Stroke: ·700 in.
Compression: 8 : 1
Bore/Stroke ratio: 1·04
Max. torque: 41 ounch-inches at 8,500 r.p.m.
Max. B.H.P.: ·495 at 14,600 r.p.m.
Power output: ·1 B.H.P. per c.c.
Power/weight ratio: ·065 B.H.P. per ounce
Bare weight: 7⅜ ounces.
Material specification:
Cylinder: leaded mild steel
Piston: Meehanite
Crankshaft: hardened steel
Crankcase unit: Light alloy gravity die casting.
Cylinder head: Machined alloy; Gold anodised
Back cover: Die cast light alloy
Propeller driver: Dural
Bearing: Cast iron sleeve (plain)
Spraybar: Brass
Glo plug: not specified, KLG plug used on test.
Manufacturers:
GORDON BURFORD AND CO. LTD., Grange, South Australia
Price: **£5 19s. 6d.** (Australia)
British Agent: PERFORMANCE KITS, Coventry

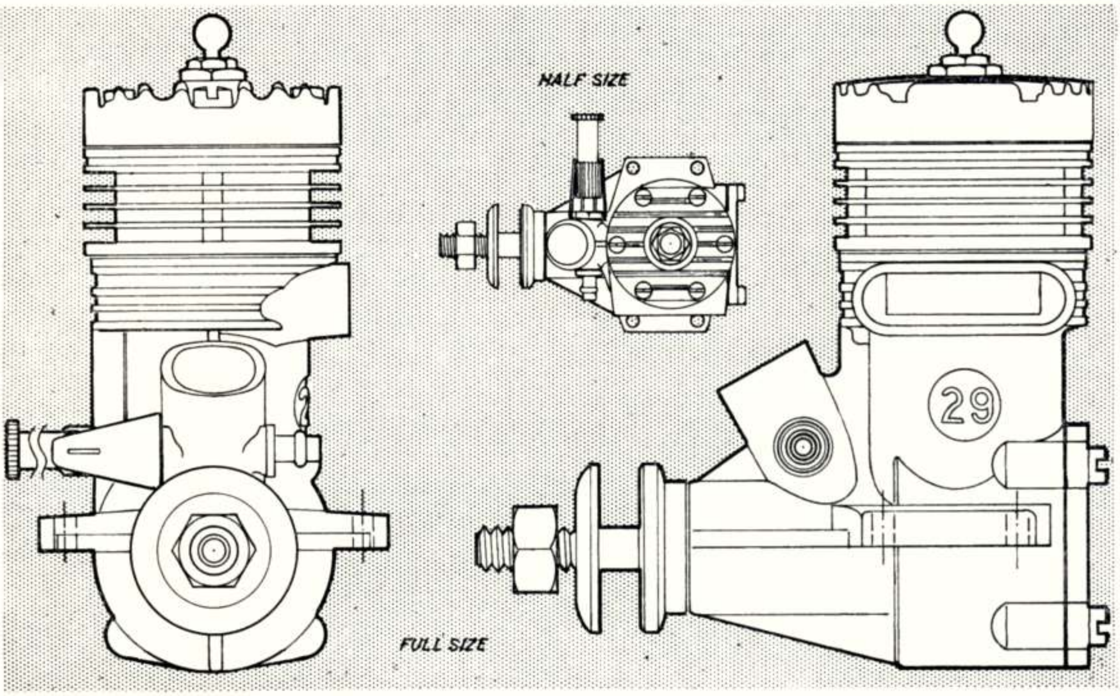
The crankcase unit is a substantial casting weighing approximately two ounces, with a minimum of machining, and the head is gold-anodised, machined alloy.

Summarising: an orthodox glow motor of sound construction and also well made. Both the design and construction show obvious familiarity with model engine requirements and a certain amount of additional "know how" as well—as evidenced by the extremely good performance figures realised. And it looks strong enough to take a lot of abuse.

PROPELLER—R.P.M. FIGURES

Propeller dia. x pitch		*r.p.m.*	*Propeller dia. x pitch*		*r.p.m.*
12 x 4	(Trucut)	8,500	9 x 3	(Tiger)	14,900
11 x 4	(Trucut)	9,900	8 x 3½	(Tiger)	18,000
10 x 6	(Trucut)	9,600	10 x 4	(Stant)	12,800
10 x 4	(Trucut)	10,100	9 x 9	(Stant TR)	10,000
9 x 6	(Trucut)	11,400	9 x 5	(Stant)	13,000
8 x 6	(Trucut)	13,000	9 x 4	(Stant)	13,800
8 x 5	(Trucut)	16,500	8 x 4	(Stant)	17,000
8 x 4	(Trucut)	17,000	8 x 6	(Stant)	13,900
7 x 6	(Trucut)	15,000	7 x 6	(Stant)	17,300
7 x 4	(Trucut)	19,000 plus	7 x 4	(Stant)	18,000
			10 x 6	(Frog nylon)	10,800
			9 x 6	(Frog nylon)	12,800

Fuel used: 25 *per cent. castor*; 55 *per cent. methanol*; 20 *per cent. nitromethane*



FAMOUS BIPLANES

Number 21
described & drawn by G. A. G. COX

VICKERS VIMY

Dramatic view of the Vimy after take-off on June 14, 1919, shows how the nosewheel assembly was left off, although fitted prior to shipment as seen in front view opposite.

WITH THROTTLE LEVERS thrust forward and engines roaring, the great machine rolled across the uneven ground of Lester's Field. In a wide climbing turn it passed over St. John's, heading for a great circle course to Ireland. Far below in the harbour, ships mimed in steam the good wishes of every earthbound soul for the success of two brave men: two specks of humanity bound for an infinity of space.

Alcock flew at 1,200 feet as the coast of Newfoundland passed slowly under the leading edge of the wing and Brown, winding out the trailing aerial, transmitted to Mount Pearl wireless station, "Vimy crosses coast of Newfoundland 4.28 G.M.T.". Behind them lay nearly three weeks of suspense and frustration. There had been the disheartening difficulty in finding an adequate take-off ground in a country unsuited and unprepared for aviation.

Hawker and Mackenzie-Grieve had already made their attempt, but their Sopwith "Atlantic" was forced down with engine trouble in mid-ocean. The Martinsyde "Raymor" with Raynham and Morgan aboard came to grief near the end of its take-off run, and the massive Handley-Page V 1500 which had suffered radiator trouble during test flights was awaiting spares from England. There had been three failures so far (the U.S. Navy blimp which was to have tried the non-stop crossing broke away from its moorings at Quidi Vidi field in Newfoundland and was never seen again) and the Vickers venture could easily be the fourth. In the knowledge that the odds were so high against Alcock and Brown, Boulton and Paul pressed on with work on a version of the "Bourges" bomber, and Raynham and Morgan worked feverishly to repair the "Raymor". Lord Northcliffe's prize of £10,000 offered a very generous incentive but the real motives, those which transcended all others, were those of national prestige and the proof to a cautious world of the commercial value of the aeroplane.

For half-an-hour the Vimy flew on in the tranquility of a clear, still sky, but at five o'clock there rose above the horizon a massive bank of fog stretching interminably to the north and south. There was no alternative but to fly straight into it and to attempt navigation by dead reckoning. Brown began to transmit their estimated position when he noticed the aerial current ammeter. Instead of flicking with every tap of the key it was stubbornly still. He glanced round at the generator on the centre section strut; the propeller blades had sheared right off. They were without vision, without voice. By six o'clock there was no sign of a break in the fog, so Alcock decided to climb above it if possible, so that his navigator could sight the sun. Slowly he eased the stick back, coaxing the bomber to a higher altitude, but as he did so a frightening noise on his right made him look round in horror. The inner exhaust of the starboard engine had split and was vibrating madly in the flames from the six cylinders. The crew watched helplessly as the metal reached red heat then melted completely away, spitting white-hot fragments towards the tail of the aircraft.

Miserably cramped and cold, their electrically-heated suits useless now that the batteries were flat, Alcock and Brown fought cramp and physical strain in their restricted cockpit. The sky was assuming that luminous quality which heralds the dawn when the bomber, now past the half-way mark, flew into clear sky, only to be confronted by a towering mass of cumulus too near for any form of avoiding action. The machine plunged into a storm of incredible violence and was hurled with supernatural force into the dark arena of the clouds. With lateral clinometer rendered useless and air speed indicator jammed, the crew were at the mercy of the tempest.

There is one physical sensation which every pilot recognises—the sickening feeling in the stomach as an aircraft stalls—when it hangs briefly motionless before a plunge. Instinctively Alcock looked towards the altimeter as the aeroplane stalled. Almost blinded by lightning and the driving hail, he could just see the needle at the four thousand mark. The seat pressure against his back and the altimeter told him the rest. 3,500 feet, 3,000, 2,000 1,000, the huge machine hurtled in a spiral dive while its pilot, aware at last of the direction in which he was going, fought frantically to correct its suicidal course. The screaming engines quietened as he throttled back. 500 feet, 250, 200, and still the tormented plane plunged from the passion above. 150 feet, 100 feet—surely this must be the end of their hopes! At sixty feet above the water the Vimy emerged into clear air, and in the same instant Alcock centralised the controls and pushed open the throttles. The mighty Eagles roared their response as the craft levelled out with her wings actually bathed in the ocean spray. A full 180 degrees turn back on course, a faltering laugh of relief from the crew, a climb to 6,500 feet, and on with the routine of horizontal flight.

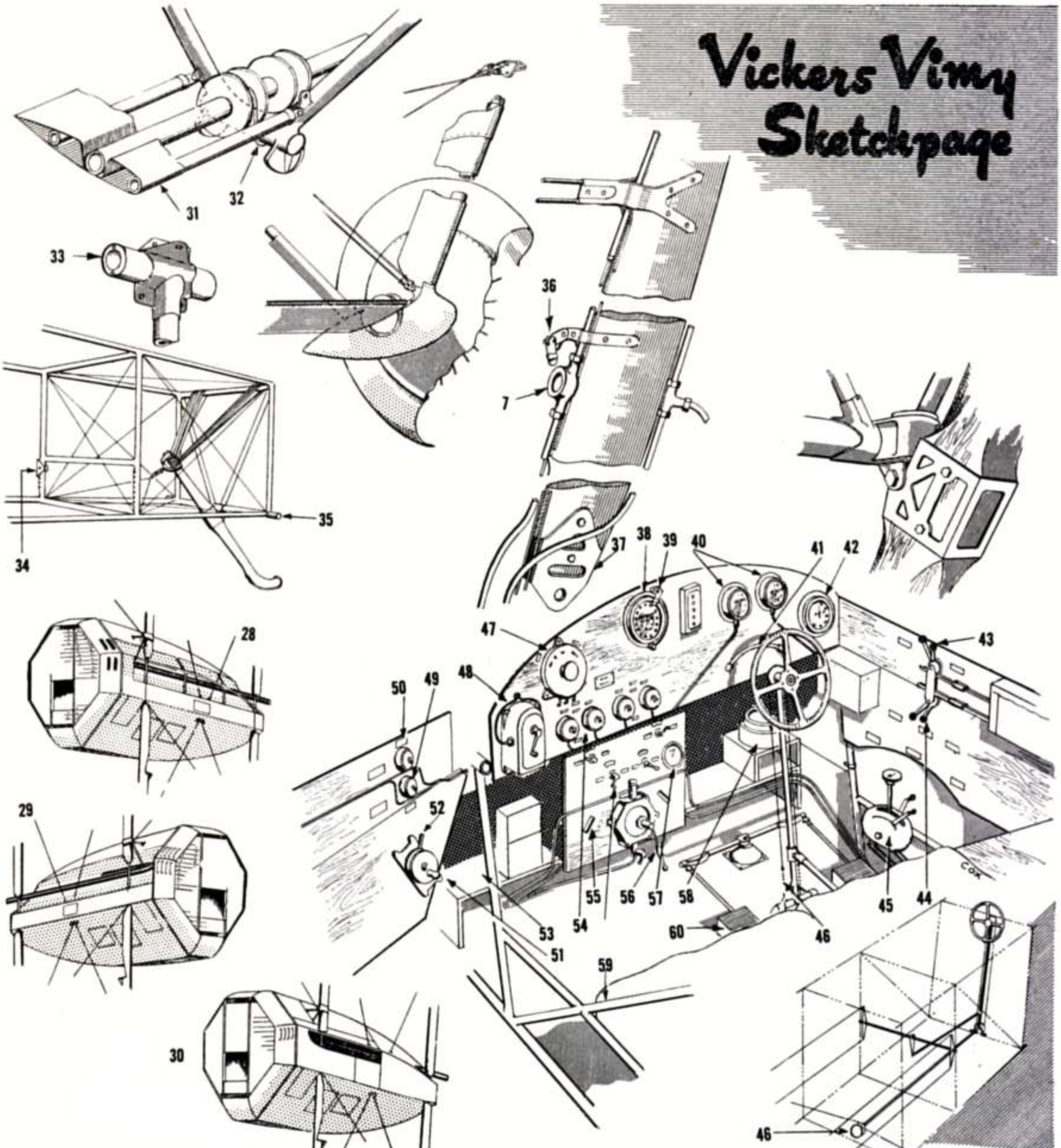
The respite was short-lived. In a matter of minutes heavy rain began to beat against the aircraft, giving way to hail, and then to snow, gathering on the wings and

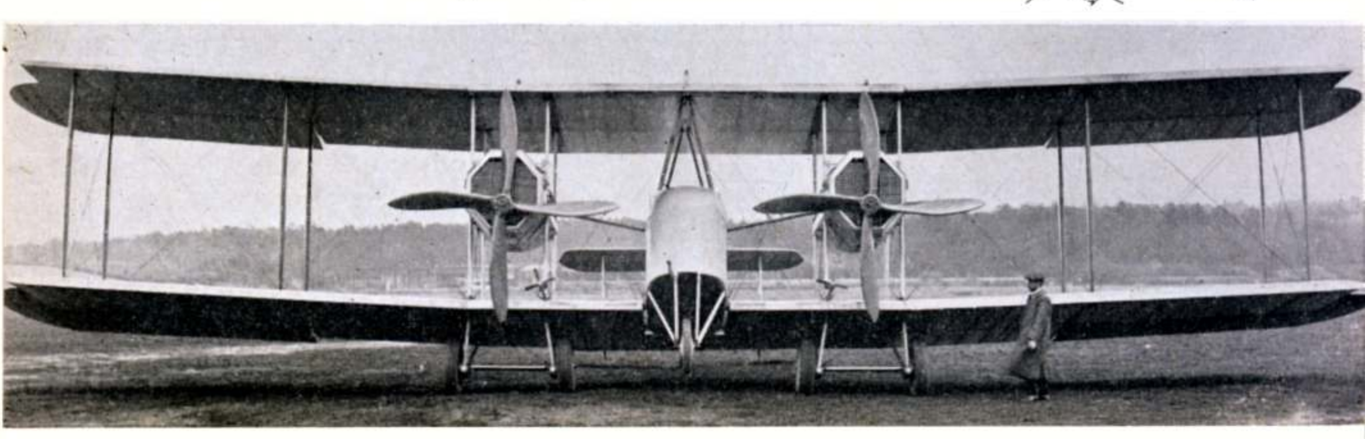
Key to Vimy Sketchpage (opposite)

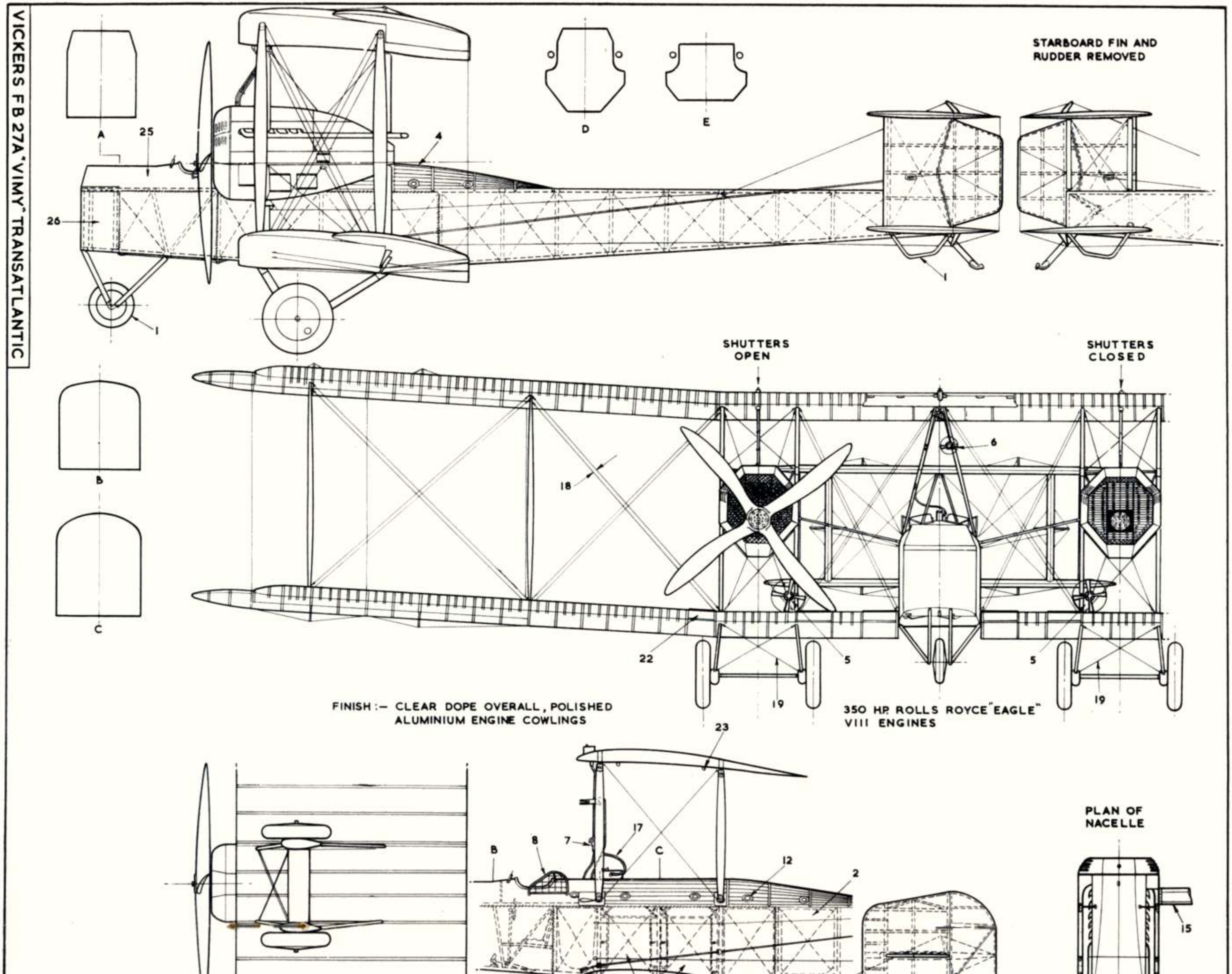
28. Nacelle as fitted at Brooklands. **29.** As assembled in Newfoundland and flown across the Atlantic. **30.** As reconstructed after the crash. **31.** Aluminium undercarriage fairing. **32.** One strand only of elastic cord shown. **33.** Rear fuselage constructed of hollow wooden tubes. **34.** Front spar fitting could be located on any hole for tail trim. **35.** Rear spar fitted over this tube. **36.** Lamp. **37.** Typical steel strut end fitting. **38.** Altimeter. **39.** Lamp. **40.** Oil temperature. **41.** Clinometer. **42.** Air speed indicator. **43.** Ignition timing. **44.** Radiator shutter control. **45.** Mixture and throttle. **46.** Chain and sprocket drive. **47,** Magneto switch. **48.** Hand starter magneto. **49.** Petrol flow indicator light. **50.** Engine nacelle light. **51.** Aerial winch. **52.** Clutch. **53.** Bench supporting front gunner's seat or L.R. tank. **54.** Engine switches. **55.** Glass petrol flow indicators. **56.** Hand petrol pump. **57.** Petrol compass. **59.** Steel tube construction forward of rear wing spar. **60.** Corrugated aluminium.

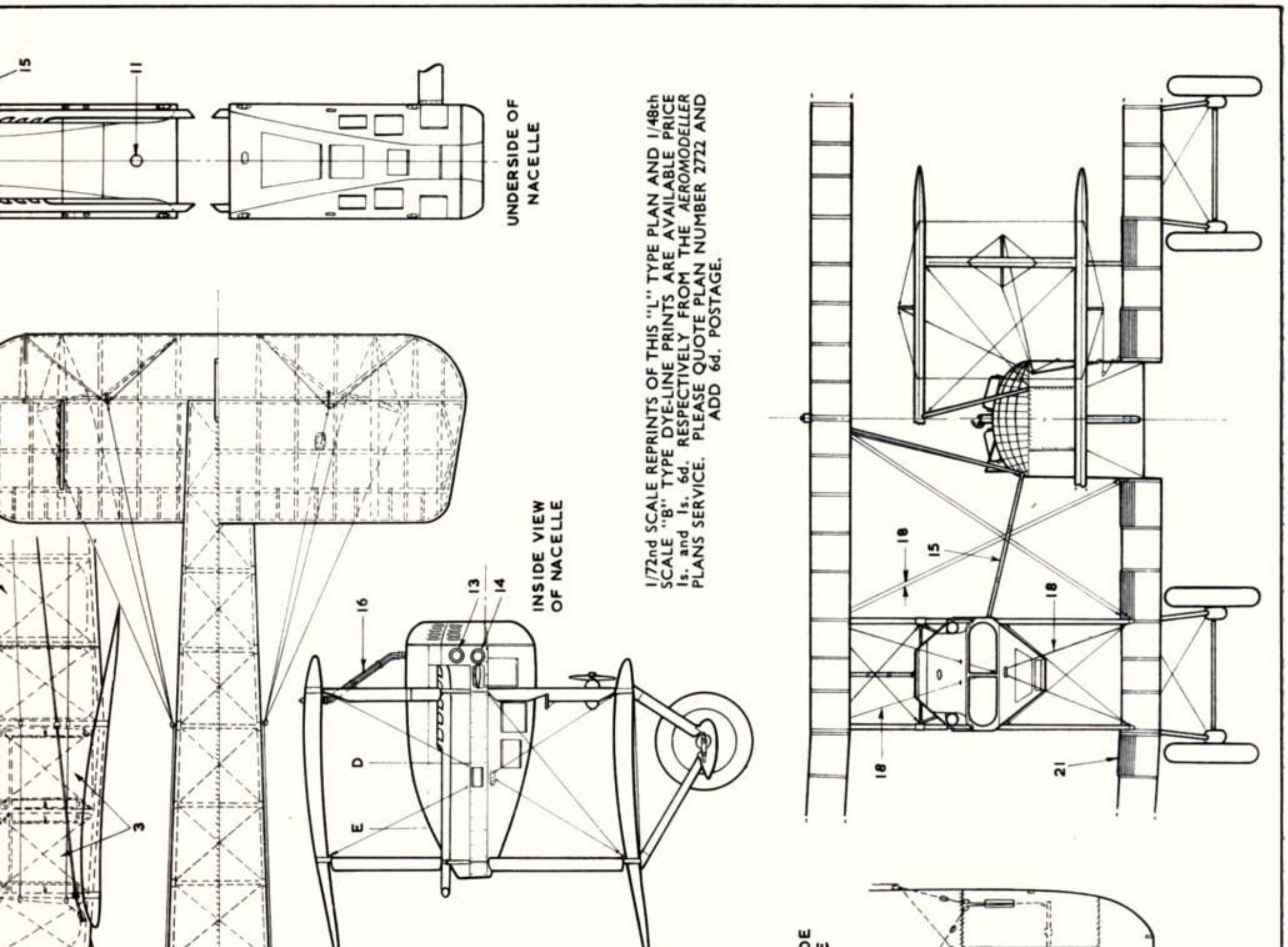
The writer wishes to acknowledge the generous help given by Mr. C. F. Andrews and the Vickers Armstrong Aircraft Company who, with commendable foresight and sense of public service, have preserved to this day the technical data on the Vimy aircraft.

Vickers Vimy Sketchpage





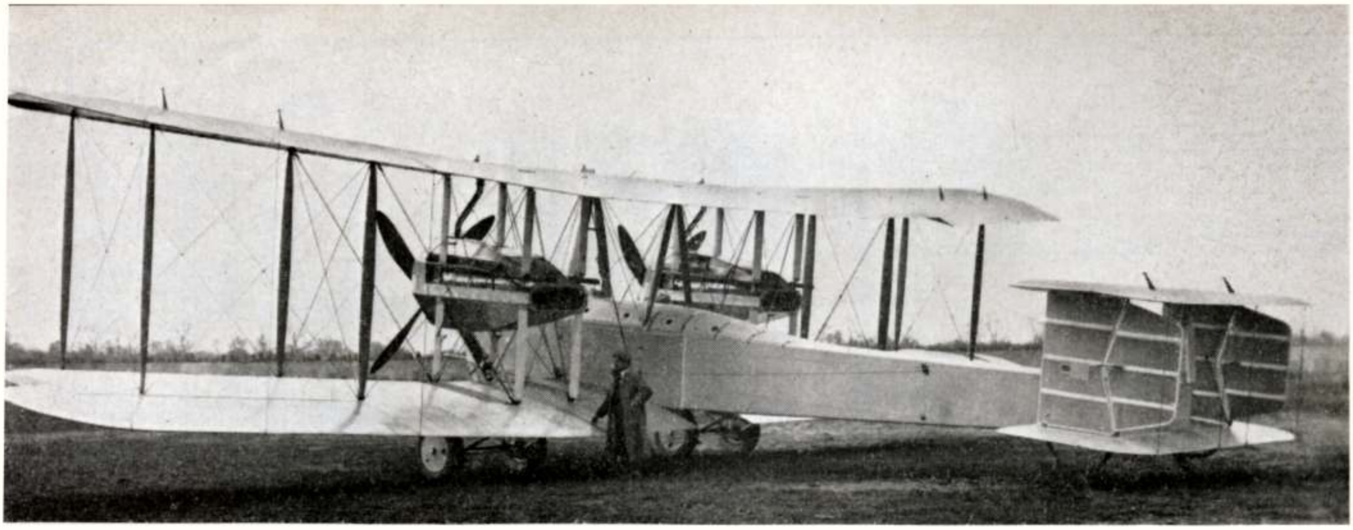

VICKERS FB 27A "VIMY" TRANSATLANTIC
STARBOARD FIN AND RUDDER REMOVED
SHUTTERS OPEN
SHUTTERS CLOSED
FINISH :— CLEAR DOPE OVERALL, POLISHED ALUMINIUM ENGINE COWLINGS
350 HP. ROLLS ROYCE "EAGLE" VIII ENGINES
PLAN OF NACELLE
A
B
C
D
E
1
2
4
5
6
7
8
12
15
17
18
19
22
23
25
26



KEY TO DRAWING

1. Nosewheel assembly and tail tip skids omitted for transatlantic flight. **2.** Extra fuel tanks in place of front and rear gunners. **3.** Buoyancy equipment in bomb bay. **4.** Decking extended to house extra tanks above upper longerons. **5.** Wind driven fuel pumps. **6.** Wind driven generator. **7.** Fuel flow indicator. **8.** Guards painted black. **9.** Gravity tank in L.E. **10.** Water tanks. **11.** Oil filler cap. **12.** Fuel filler caps. **13.** Oil pressure gauge. **14.** R.P.M. **15.** Engine controls and fuel pipes in fairing. **16.** Water pipes. **17.** Fuel expansion pipe. **18.** These lift wires double. **19.** Double wires. **20.** Gun ring removed, opening covered with fabric. **21.** Wooden slats for wing walk between main spars. **22.** Aluminium inspection doors. **23.** Eye bolts on wing C.L. **24.** Inspection windows in underside. **25.** Ply covered as far as front spar. **26.** Ply covered as far as section "A". **27.** Filler for front auxiliary tank.

FT.



Fuselage alterations and nacelle detail are clear in this view of the trans-Atlantic Vimy before shipment to Newfoundland

struts with alarming rapidity. Ice choked the engines, in a very few minutes they would stop altogether unless drastic action were taken. Brown did not hesitate. Unfastening his belt, he painfully edged his way back along the fuselage. With numbed fingers he clung to the engine control fairing which spanned the gap between fuselage and nacelle as the slipstream tore at him as he edged, inches from the propeller, along the ice-covered wing to hack with a knife at the shroud of snow covering the engine instruments and air intake on each nacelle. *Six times* Arthur Whitten-Brown, the cripple, risked his life to keep the aeroplane flying. (In our cover painting Ken McDonough portrays the scene as he frees the pitot tube.)

At 7.20 a.m. the Vimy found clear sky again at 11,000 feet above an endless carpet of cloud. They were now only eighty miles from the coast of Ireland but the aircraft was still badly iced-up and a descent to warmer air was imperative. An engine faltered, then backfired. Alcock tried desperately to coax it into submission but the radiator shutters were completely blocked, so again were the air intakes. There was only one possible course of action; he throttled the engines right back to idling speed and glided down through the cloud mass to seek a layer of warm air. Lower and lower went the plane—right down to 500 feet and then suddenly, clear air and the beckoning white horses of the Atlantic breakers saved the awkward situation.

The ordeal was nearly over. Two specks appeared on the horizon, then the rolling hills of Connemara and the green expanse of land around the Clifden radio station. The ground looked so smooth and inviting—how were they to know that it was a treacherous bog? By the time Alcock could identify the clumps of marsh grass and pools of water he was too late to change his mind. The great bomber travelled a few yards leaving a wake of mud, and then nosed over. One violent lurch, then all was still.

Their welcome was tumultuous. This country had never witnessed such scenes of hysterical adoration. The courage, perseverance and skill of John Alcock and Arthur Whitten-Brown had bestowed success upon one of the greatest aerial adventures of our time. At a special investiture at Windsor Castle the two men were knighted in recognition of their services to their country, and no honour has ever been more richly deserved.

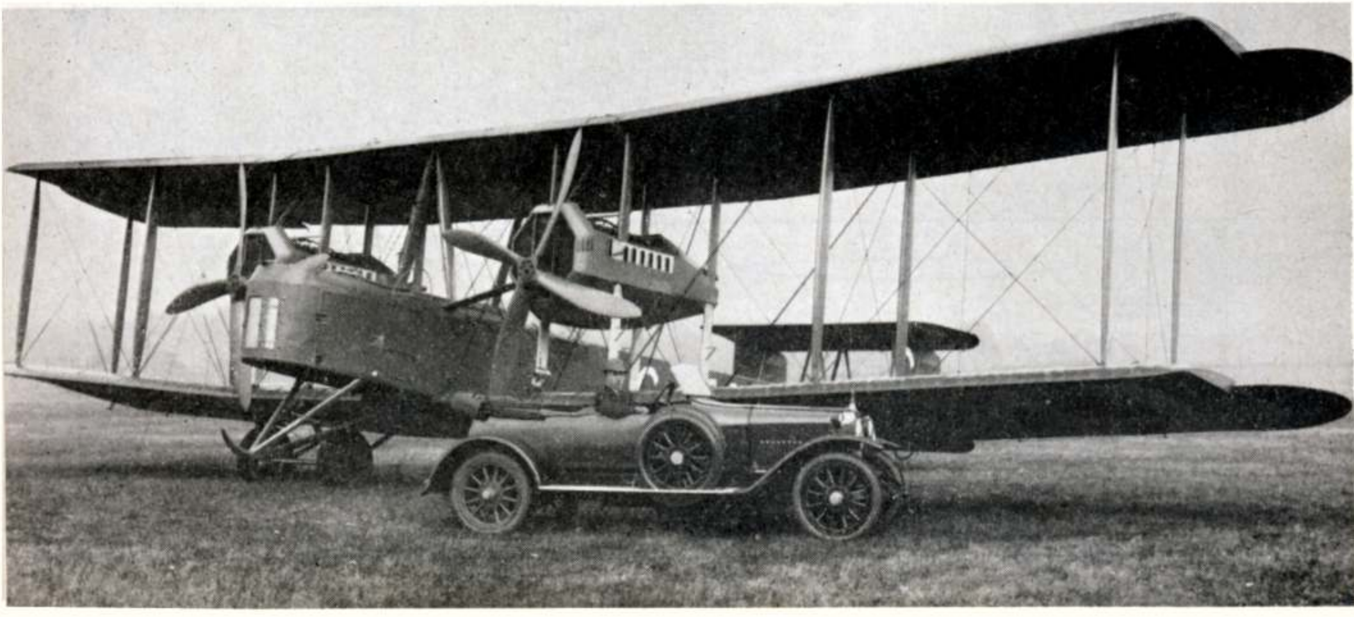
The Australia flight *(described T. W. Norman)*

ON APRIL 26TH, 1958, at Adelaide Airport, 40,000 people attended the opening of a memorial to the men who made the first flight to Australia. The £30,000 memorial consists of a hangar housing the Vickers' Vimy G-EAOU and a statuary group of the four pioneers.

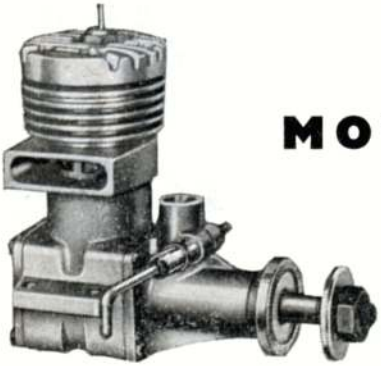
It had all started in March, 1919, when the Australian government offered £10,000 to the first Australian demobee to do the flight home in 30 days or less. The winning flight was made by Capt. Ross Smith, pilot;

continued on page 274

Sir John Alcock poses in vintage transport before the Australia flight, Vimy G-EAOU- literally transcribed as "God 'elp all of us"

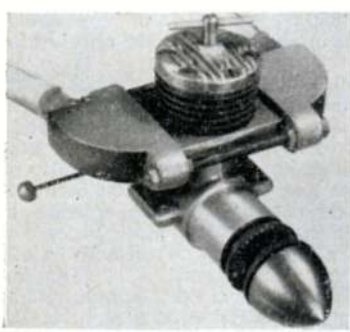


MOTOR MART



Above: Micron 5 c.c. Super Sport has surface type needle jet.

Ho Fang-Chiun owns this novel hybrid of a Taifun Blizzard cylinder in a Tornado crankcase, made when he was working at the German factory last summer.



E.D.'s new exhaust collector/silencer fittings are functional if not streamlined. Ideal for boat work or aircraft where cleanliness and silence are desirable virtues.

Fox .09 below with tank cover detached has screw-in cylinder, piston controlled intake, has ideal layout for a pusher.

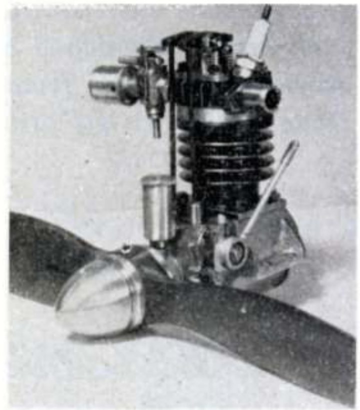
A. E. Rivers (Sales Ltd.) are offering a tuned version of their new 2.5 c.c. diesel at a price of £8 17s. 2d.

Work on the tuned version involves a new crankshaft and cylinder liner-piston assembly, all individually reworked. Modifications include shaping and polishing the intake venturi; honing the modified shaft induction port to a mirror finish, overbalancing the crank web for dynamic balance at high load-speeds; and additional small transfer passages are worked in the crankcase to improve transfer area. Same system of main bearing is employed except that rows of balls are used instead of solid spacers between the rollers on the rear bearing.

New Rivers 3.5 c.c. diesel follows the same design layout as the 2.5 c.c. but generally increased in size all over. It will not be a bored out version of the 2.5. Prototypes should be flying at the Nationals.

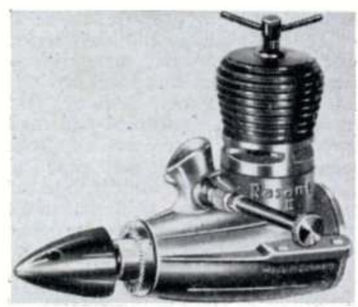
An Aero-engine version of the water-cooled **"Gannet"** 15 c.c. *four-stroke* spark-ignition marine engine has been produced by Norden and Muirhead. Basically an identical design, the water jacket is replaced by a finned cylinder. A similar carburettor is retained, giving full throttle control down to idling revs. and immediate response to throttle movement. In fact, the aero-engine "Gannet" is extremely flexible and easy to handle on a "Truflex" plastic 14 x 8 which offers 6,000 r.p.m. Low speed torque of this engine is remarkably high, permitting a much larger diameter propeller—probably 18 x 4 to operate at 4-5,000 r.p.m. Whilst the size and weight of the aero-engine "Gannet" obviously limits its application to anything but a very specialised demand for a large, flexible power unit, it is an extremely well made "model engineering" job and very interesting to handle.

Tear drop cross section front rotary intakes are the fashion for 1959 models of **Taifun** engines. The Hobby 1 c.c., Rasant 11, 2.47 c.c. take on the new look and a very smart cast bullet shape (with single or twin outlets) exhaust silencer assembly is added to the range in sizes to fit all Taifun engines. In France, **Micron** have introduced the 5 c.c. "Super Sport" glow motor with a claim of .55 b.h.p. at 15,000 r.p.m. Surface needle jet and a special Micron hot plug are distinguishing features of an engine



15 c.c. Gannet is four stroke, peaks at low speed on large props.

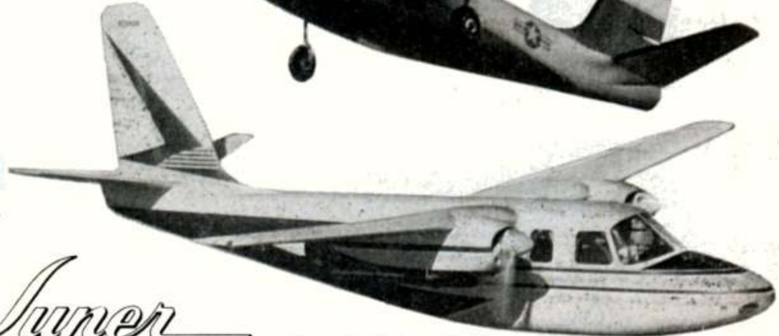
which should do well for a variety of purposes. Already it has several speed wins to its credit. Speaking of credit, yet once more we doff our cap to Duke Fox for striking originality in engine design. The **Fox .09** is sideport: but the timing is such that it yields nothing in performance to rotary intakes. Suction is high, the .09 runs either way. Straight out of the box it held 17,000 r.p.m. on a Frog 6 x 4.



New look in Taifun engine intakes is evident on the Rasant 2.47 Mk. II. Flexible needle and bullet shape crankcase are attractive features.

Smart packing of Cox Babe Bee .8 c.c. engine now well established on the British market, eliminates need for boxes and keeps costs commendably low.

A superb 54 inch control-line scale model developed by Aeromodeller staff from Doug McHard's f/f prototype



AERO Commander Six-Eighty Super

for 1·5 to 2·5cc engines

THE FIRST Aero Commander was produced by a group of engineers on a very limited purse. The design was originated by ex-Douglas Aircraft employee Ted Smith who, together with his small team, after three-and-a-half years in design and construction, saw their prototype take the air on April 28th, 1948.

The aircraft was a success from the start and much of this must be attributed to the determined way in which the designers set about keeping the airframe as light, yet robust, as possible. Other designers with the same aim in view have neglected the eye appeal of their brainchild, but not Smith, whose product must surely rank among the most elegant small aircraft flying today. The light airframe weight brought about by such features as one-piece wing and unit constructed tailplane allowed for the incorporation of a sturdy retractable undercarriage thus further increasing the performance and enhancing the appearance in the air.

The Aero Design and Engineering Company who now produce the Aero Commander, took over Smith's design in 1951 and, starting from scratch in an empty hangar at Tulakes Airport, Bethany, Oklahoma, commenced installation of equipment and machinery necessary for production. Finance was no problem, and work proceeded rapidly, the first production machine rolling from the assembly lines in late autumn.

On January 30th, 1952, the Aero Commander received the C.A.A. approved flight certificate, just after one year after tooling-up started in the deserted hangar! Such was the impact of the design that even before the plane was passed by the C.A.A. more than 50 firm orders had been placed.

This first version was known as the "520". Since then several variants have appeared, the two principal ones being the "560" and the "680 Super". These differ from the first type in many ways, but from a recognition point of view, the most noticeable difference is in the large fin and rudder which is now swept back. The latest version has a top speed of 260 m.p.h. and cruises at around 230 m.p.h., much of the power increase is the result of engine superchargers being fitted. The increased safety factor of a twin-engined aircraft over a single is much appreciated by business executives making lengthy flights, often over difficult terrain. Single engine performance of the machine is excellent, and has been demonstrated on several occasions. A model 560 has flown non-stop from Oklahoma City to Washington on one engine!

The internal arrangements of the Aero Commander are extremely flexible. Standard seating is for five persons, but seven can be carried without undue discomfort. Seats are of the reclining type and can be removed in a matter of minutes and the machine may then be used as a light freighter, carrying a payload in the neighbourhood of 2,500 lb.

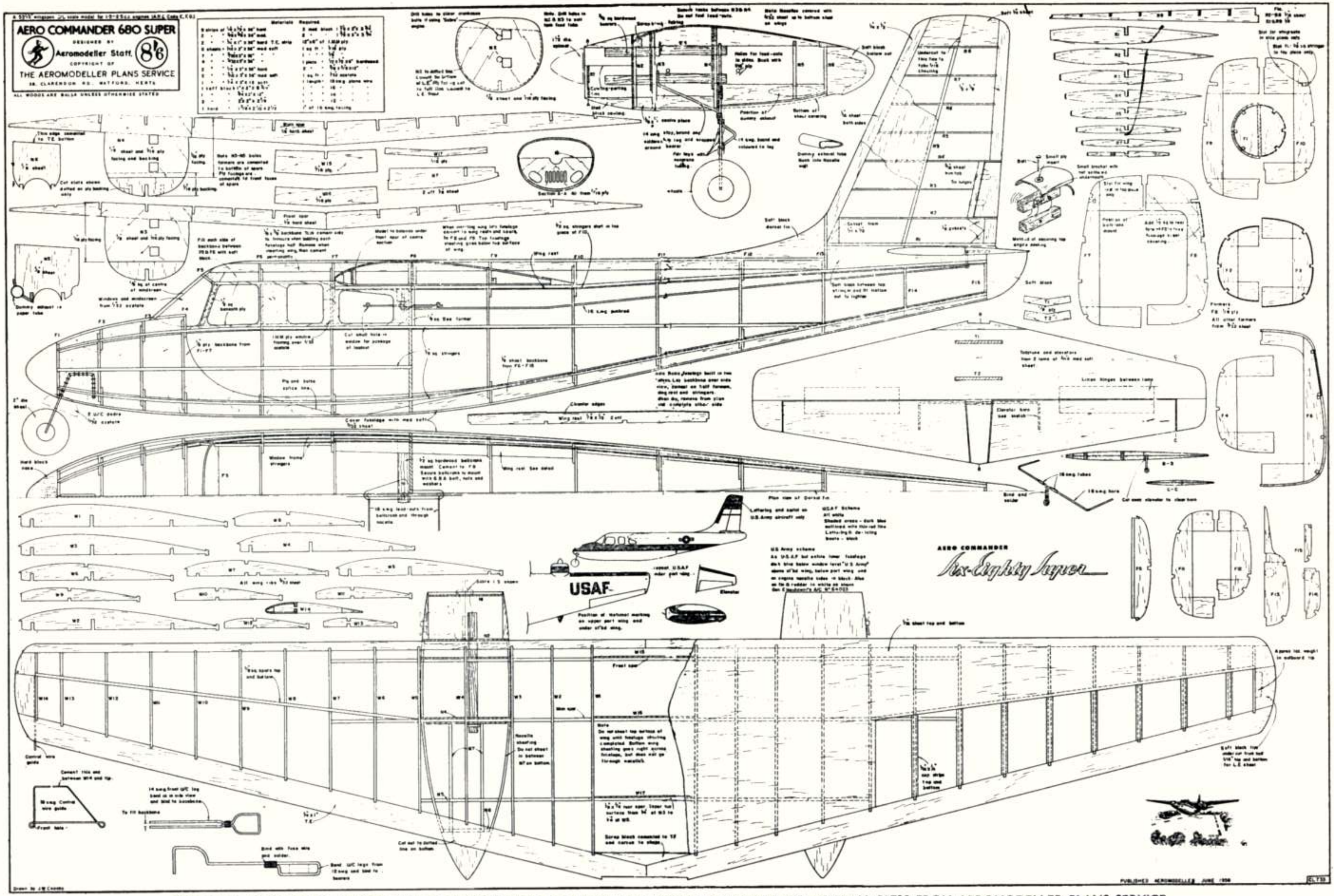
The potentialities of the design have not escaped the American service chiefs and Aero Commanders are in service with both the U.S. Army and the U.S.A.F. The Army uses a version of the 680, the designation being L-26-C, and one of these is in use as a personal transport for President Eisenhower. The U.S.A.F. Aero Commanders are of the earlier 560-A type and known in the service as the L-26B.

Aero Commanders are in service all around the world, already the success of its configuration has been recognised by other companies, who have not been slow in adopting many of its original features. The price, by the way, is $84,500.

The original model, reduced size plans of which appear opposite, was first made as a free-flight experiment. The motors were Frog 80s and were fed from individual fuel tanks. A piece of Neoprene tubing was run from a point on the fuel feed just before the needle valve on the starboard engine and the other end connected to a similar point on the port engine. When starting the engines, a valve half-way along this tube was closed in order to preserve the fuel suction. When both motors were running this valve was opened. The air in this connecting tube remained static as long as both motors were running and producing the same suction at each end of the tube. When either motor stopped, the suction

continued on page 274

Realism of Doug's free flight experiment in action compares most favourably with full-size aircraft in heading photographs. At right, free-flight airframe which has been modified for c/l operation

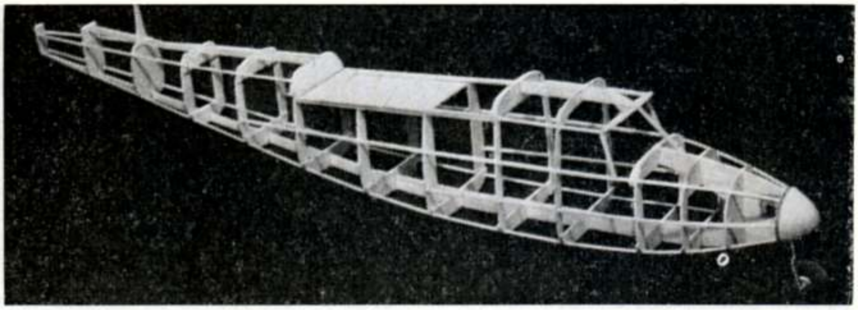


FULL SIZE COPIES OF THIS 1/6TH SCALE REPRODUCTION ARE AVAILABLE PRICE 8/6 PLUS 6d POST AS PLAN CL733 FROM AEROMODELLER PLANS SERVICE

Continued from page 272

from the remaining one drew the air out of the connecting pipe into the fuel line and was thus itself stopped. The success of the system depends upon the fuel tanks being lower than the needle valve in order that the static air will prevent fuel being drawn in the event of the opposite engine failing. Also the air line must be kept free of fuel before starting. This system was moderately successful but messy.

Fitted beneath the centre section of the wing was a horizontal piece of wire, pivoted about its centre, and extending through the cabin windows. On each end of this wire was a clear acetate "plate" fitted vertically, flat face forward. When one motor only was running, the plate on this side was blown back by the increased slipstream and thus caused the wire to pivot. This movement was in turn transmitted to the large rudder which was then automatically thrown hard over to counter the single engine's asymmetric thrust. This device, which was a safeguard against the fuel system failing, worked well in the air, but the abandonment of the free flight project was brought about by the unforeseen problem of asymmetric lift, generated by the slipstream of the remaining live motor over the wing, thus causing a spectacular roll ! ! Ailerons were considered, but owing to the very large inboard area of mainplane swept by the slipstream and the viciousness of the single engine manoeuvres it was decided to convert this particular prototype into a control liner, where it performs most beautifully. People who fly it say it almost flies itself! Which, of course, it should do! Free-flight twin engine experiments are not completely abandoned and an entirely new system promises complete success, but then, of course, it hasn't been built yet!



Above, the control-line version with J. M. Bodey who built the revised centre section, etc. Basic frame at left gives an idea of the keel construction. Wing is now integral with fuselage whereas original free-flight version was removable as seen here.

FAMOUS BIPLANES *continued from p. 270*

Lieut. Keith Smith, navigator; Sergts. J. M. Bennett and W. H. Shiers, mechanics.

The morning dawned clear and frosty over Hounslow on Nov. 12th and at 8.30 a.m. the khaki Vimy took off on the first stage of its 11,000 mile journey. Almost immediately they were forced to climb above thick snow clouds, where they spent an uncomfortable few hours at a temperature low enough to freeze their sandwiches solid.

The first of many hectic moments occurred over Pisa, when Shiers had to climb out and fix a piece of loose cowling that was pounding the exhaust to bits. Nor did they have to wait long for the second.

The field at Pisa was so boggy that when it came to leaving on the 15th Bennett had to sit near the tailplane to prevent nose-over. As the plane gathered speed Shiers dragged "Benny" in on the end of a rope.

At Ramadie on the 20th a great sandstorm threatened to blow the machine away. The crew had to hang on to it bodily all through that wild night. In the morning six precious hours were spent clearing away the sand.

On the 23rd the Vimy made an eight hour flight to the Persian Gulf, and two days later reached Delhi. They had now passed the half-way mark in 13 days and everything had gone remarkably well. But could men and machine stand up to the next 5,000 miles, each one of them adding to the toll of fatigue that could prove decisive?

Wisely, Smith ordered a rest at Delhi, and it was the 27th before they resumed their journey.

At Singora, Malaya, on December 2nd, Smith's skill alone saved them from disaster. He made a miraculous landing in a jungle clearing, missing tree stumps by inches.

Leaving Singapore on Dec. 4th. they headed for the East Indies, and by the 6th reached Surabaya, Java. Here another crisis nearly ruined their chances. The Vimy got deeply bogged and, with time running out, the flyers' anxiety was acute. Ross had a runway of bamboo built by the natives, and made an alarming take off with bamboo mats flying everywhere.

On December 9th the Vimy reached Timor. But, with a dreadfully tired crew and engines nearly worn out, Smith could hardly have relished the prospect of a six-hour flight across the sea. However, it was with great excitement that at 8.35 a.m. in a light breeze he took off and headed for Darwin. Shortly after 3 o'clock they sighted Australia, and in a few minutes were circling Darwin.

Overall the flight had taken 28 days and a flying time of 135 hours. The total distance was 11,294 miles. The bothers Ross and Keith were knighted by George V.

READERS WRITE...

Dope on Fuels

DEAR SIR,

I thought that perhaps you and your readers may be interested in the table of statistics on fuels which I have prepared for you.

Fuel	Calorific Value (cals/gm)	Percentage Power	Consumption of Pentane
Pentane ...	11,700	100	100
Decane ...	11,200	97	118
Paraffin ...	11,000	93	120
D.E.R.V. ...	10,900	91	122+
Ethanol ...	7,200	109	80
Methanol ...	5,300	118	60
Benzene ...	10,000	96	124
Ether ...	8,800	105	90
Nitrobenzene	6,000	95	105

Notice that not many improvements can be made on normal fuels, even theoretically. For instance, if you can try to run a diesel with a methanol fuel, you have a great deal of difficulty in keeping it running though there sounds to be plenty of power. My special A.M.35 was ticking over at around 10,000-11,000 on a 9 x 6 on 30 ether, 30 oil, 40 methanol brew, but was so inflexible and would run no more than a fast tick-over.

So don't look at the list for a complete solution for the ideal T/R fuel.

I may use Decane for T/R, as it is really only a very pure form of paraffin, so should run an engine well.

J. R. HOWARTH.

Blackburn.

½ A Team Racing

DEAR SIR,

I read with particular interest the first paragraph of "Hangar Doors" in your April issue. As one of the main instigators of the London Area proposal I feel that I must put forward a defence of the change, backed with some experience of building and flying this type of model.

I first built a ½A Team Racer when the High Wycombe formula was published—we in the Sidcup Club felt that this was the more practical of the two specifications put forward at the time. The reasons for the present changes are based on the following:

(1) By increasing the size of the model the range, speed and handling qualities are considerably improved, particularly the latter. Surely this theory has been adequately proved by nearly all the successful Class A racers of recent years each of which has boasted at least 100 square inches of wing area when only 70 square inches was required by the rules.

(2) Increase in line length. The speed of the models at present is far too high for the existing line length. This does not apply only to models with expensive ball-race motors, but also to such motors as the Frog 150R which take a model far too fast for safety with other models in the same circle.

(3) By increasing the wing area and reducing wing loading and landing speed ½A models will now be able to land with reasonable safety on a grass surface instead of cartwheeling as in the past. As at least 50 per cent. of competitions are held over grass this should mean that there will be more ½A competitions and it will be more worthwhile for a "competition modeller" to build this type of model.

May I add that this proposition created one of the most animated discussions that the London Area Meetings have seen for some time past and was not as you suggest put forward without due thought, consideration and wide consultation.

In conclusion I would say that I think the new rules are a progressive step forward. The theory that there ought to be a class restricted to a cheaper type of motor in order to encourage juniors is, to my mind, entirely wrong. In my experience juniors are seldom short of money and if sufficiently keen and able will shine against senior competition.

A system of "wet-nursing" idle juniors is both energy wasting and entirely unproductive as regards the movement as a whole.

M. BASSETT.

Eltham, S.E.9.

Letters to the Editor should always be accompanied by a stamped and self-addressed envelope for the convenience of our reply. We regret that without this gesture we cannot undertake either to acknowledge correspondence or provide answers to readers' queries.

Plastic Reply

DEAR SIR,

I feel I must reply to Mr. Moroney's letter (THOSE PLASTICS) in your March issue. After reading this rather pointless letter, may I suggest that Mr. Moroney removes the last two letters from his name?

So little craftsmanship is required with plastics? I have a plastic FW.190D in 1/72nd. scale which has a sliding canopy, flaps, rudder, and bomb release, operated from the cockpit, plus a fully-detailed and detachable engine. That is only one of 15 W.W.II models I have built.

I build plastics because I want every little detail in my authentic collection of fighting aircraft. I am sure that if this gentleman has to examine my collection, it would give him a nasty jolt to see just how much detail can be crammed into a plastic model, of 1/72 scale.

I suggest that Mr. Moroney obviously considers himself a "superior" type. Or could it be a simple case of "sour grapes". After all, we plastic-builders do *him* no harm that I can think of. Come, sir, why not live and let live?

I am enclosing several photos of plastics built by my young lady to show our average standard.

DAVE WISEMAN,
HILDA (RUSTY) WOOD

Acton, W.3.

See below

Thermal Rotation

DEAR SIR,

Re the "What's the answer" column in the February issue. Here in Australia, the thermals definitely do circle to the left.

My A/1 gliders both have a left glide trim, and the other day one tightened the turn to the left in a thermal till it was banking vertically.

Left trim always seems to catch and hold the thermals better here. (Last free-flight day four models went O.O.S., one Y-bar being lost in a cloud after 10 minutes. Still, we are 3,000 feet above sea-level.)

I suppose the reason for the thermals turning left here and right in England is the same as that for the circling bath water over the plug-hole turning in different ways too.

Anyway, if a plane hooks a thermal here, or anywhere, without a D/T, its a long chase!

R. CONNAUGHTON

Orange, N.S.W.,
Australia

Request Dept.

DEAR SIR,

I am writing this letter to you to thank you for yet another wonderful issue of the AEROMODELLER. My only complaint is that you offer no facilities whereby we modellers may tell the manufacturers WHAT WE WANT!

For instance, where can we obtain the following:

Modelspan, in sheets larger than 20in. x 30 in.?
Piano wire, in sizes greater than 10 s.w.g.?
Balsa Cement, extension nozzles for tubes?
Glow Plugs, with idling bar?
Air Wheels, over 4 in. diameter?

These are just a few of the things we modellers would like to see. I therefore suggest that you have a column to enable us to tell manufacturers what we would like, instead of them trying to tell us what we want.

V. C. REDFERN.

Market Harborough,
Leics.

Extension nozzles and 6-in. airwheels have been marketed in the United Kingdom but are, apparently, no longer available. Mr. Redfern's idea for a request column would depend on readers' demands—any other requests?—ED.

Tall Order!

Dear Sir,

Is it possible for you to let me know how many missions the Lancaster G for George of 460 Squadron R.A.A.F. took part in. The serial number of this aircraft is W4783 and I believe that it is now in the Australian War Museum.

P. SCOTT

London, N.W.6

Whew! This is typical of the decor detail requests we get—and with NO S.A.E. for the convenience for our reply. Sorry Mr. Scott, our records do not cover so extensive a field, though we'd like to help. Perhaps one of our readers down under can check up for us.

WORLD NEWS

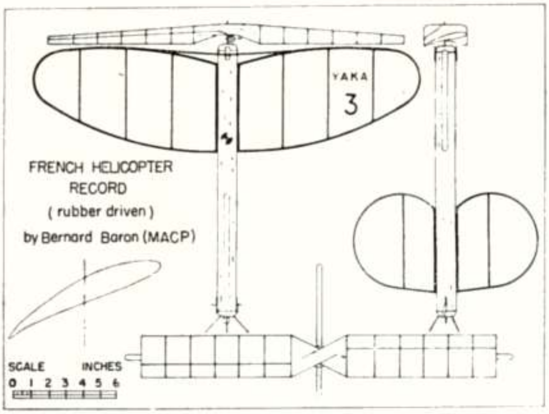
MORE NEWS from the **New Zealand** Nationals tells us that the over-all champion of the meeting was a Junior with the appropriate name of Johnny Winn from Auckland. John placed 2nd in "A" T/R, 1st in "B", 1st in 10 c.c. speed, 2nd in Power and 1st in A/1 Glider—a stout performance which must have given the seniors something to think about. John was Junior Champ last year as well. These N.Z. Nats run through from Sunday (6 a.m. start!) to 1 a.m. (prizegiving conclusion) on Thursday and the longer spread-over of events in a holiday atmosphere encourages the all-rounder to enter everything.

The same situation applies in Australia and **South Africa** where the Nats were held over Easter at Johannesburg. To put one in the picture, imagine the clubs of Madrid, Rome and London travelling to Munich for their annual event and you have an idea of the distances involved when Cape Towners and Durbanites go to the Rand. Everyone arrives with a carload of models (Pete Visser had eleven) and enters as much as possible. There's great competition to get the Championship honours and this year Brian Partridge was all set for taking the trophy for the third time when his leading "B" Team Racer (Moir-Fox) was dunked and broke its bearers. C. Cannon from Bloemfontein was the deserving high-point winner and he'll have his chance of defending the trophy on home ground next Easter when the "Centre-City" plays host. Far-travelled Western Province from the Cape were Champion Club and highlights from the many events were: King-size thermals and the d/t failures in free-flight, many models lost. *Lucifers*, *Inch Worms*, *Ramrods*, *Dream Weavers*, *Y-Bars*, *Arrows*, and *Thunderbirds* most popular designs, engines which impressed were Enya 29 (f/f), A.M.10 ($\frac{1}{2}$A T/R), apart from the usual run of Olivers and Torpedoes, but the Cape impression is one of altitude effect especially on the larger glow engines. Durban has no free-flight field, so their regular Team Race practice gave the club a clean sweep of all racing. Pit stops were fast and times claimed to rival those from overseas. No news of Multi R/C which was run separately at another airfield.

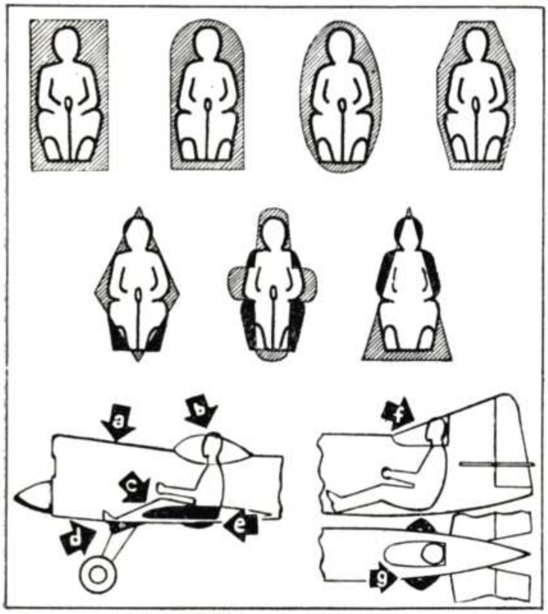
Five eliminators have been held to select the **Israel** A/2 team to go to Belgium. Process of elimination narrowed the field to six modellers at the finals and after an 11-round event, team members Josef Kiflawi, Naftali Kadmon and Rami Feldleit qualified for the long trip in August.

The ice in **Finland** has melted and the lads have lost their spacious flying fields! While we in Britain have our Nationals at Lincoln, the Finns run their annual "Chrysler-Plymouth" sponsored meeting over the same period, for free-flight and control-line events. This attracts a large entry from all over the country and includes a class yet to achieve popularity outside of the Nordic countries, known as C-1, for small rubber-driven models.

The site for the Wakefield finals in **France** is said to be an airfield under U.S.A.F. jurisdiction and may well have an established model club as have most other U.S.A.F. bases. It is not generally realised that the U.S. Army has a great interest in the hobby as a recreation and instructional activity to promote skill and initiative. All Army bases in Europe have been invited



Top, from CANADA, Dick Foster's Sancho A/2 averaged 2 : 43 to win 3 events in Montreal. Next, a novelty from FRANCE in the form of tissue covered Helicopter. Left: Two Veco 19's power Cliff Wagner's Do 215, which has won several contests at Modesto, Calif. U.S.A. Engines have Bramco throttles fitted.



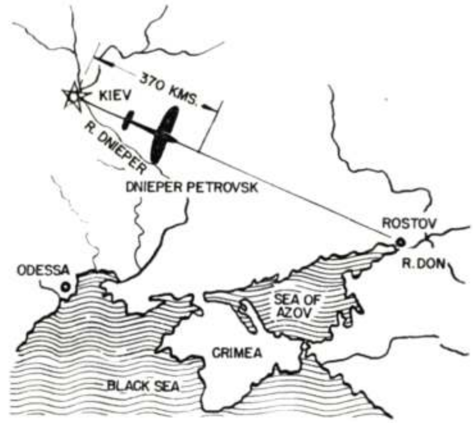
From "Avion" in SPAIN, we reproduce team race design points. First line are acceptable sections, 2nd line the illegals and bottom sketches the bad features of poor pilot installation

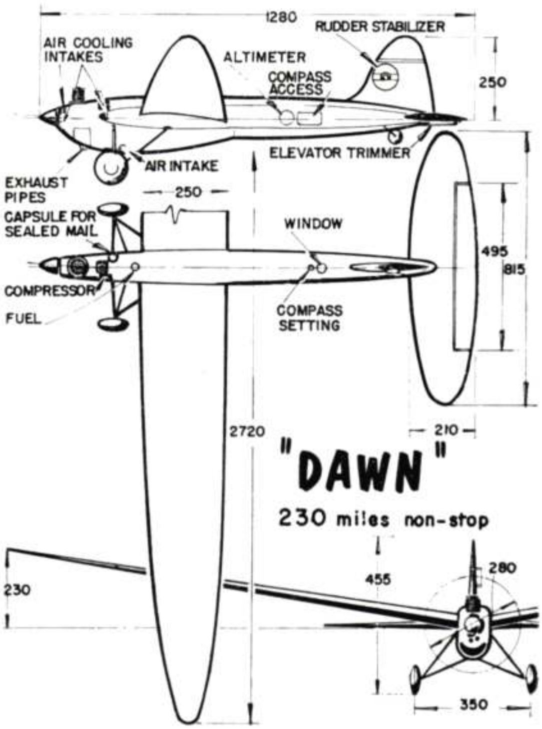
15-oz. Cessna Bird Dog by Capt. R. Willoughby, U.S. Marines was made in JAPAN for rudder only R/C with a .8 c.c. Thermal Hopper and Deltron receiver

to run eliminating events at area command level to select representatives for a final at Karlsruhe, Germany, on August 15th-18th. 108 finalists in f/f and c/l events will compete for an impressive set of prizes and trophies at this 1959 USAREUR Championships.

How fast will Radio Control speed get? Dale Root pushed his well-known "Ascender" to 65.73 m.p.h. over the East Bay Radio Controllers' 328-ft. electronically timed course in California, **U.S.A.,** and speed trials are only just at the beginning stage! The E.B.R.C. distance record stands at 16 miles, with a scale Piper Cub flown by Bob Foncell. This creditable distance is somewhat overshadowed, however, by the Soviet distance of 230 miles flown by E. Kulakovsky of Kiev, **Russia.**

Specifications of his *Dawn* design do not include Radio gear, but instead, mention special automatic stabilisers connected to the rudder and trimming elevators which limited maximum altitude to 650 ft. and kept the model on a straight line course. Apparently, Kulakovsky has developed a compressor to be driven by the 3·5 c.c. KMK-5 diesel and presumably this is used to put pressure on fuel supply as well as to act as a propellant for gyro-stabilisers. Aerodynamically, *Dawn* is very clean in design, and obviously built for the record.





At right, details of the long distance flight in RUSSIA described above. Below, yet a new team racer size, the ½A subminiatures (Cox Pee Wee engines) for 15 ft. lines, flown in NEW ZEALAND by A. E. O'Connor

more Benedek airfoils...

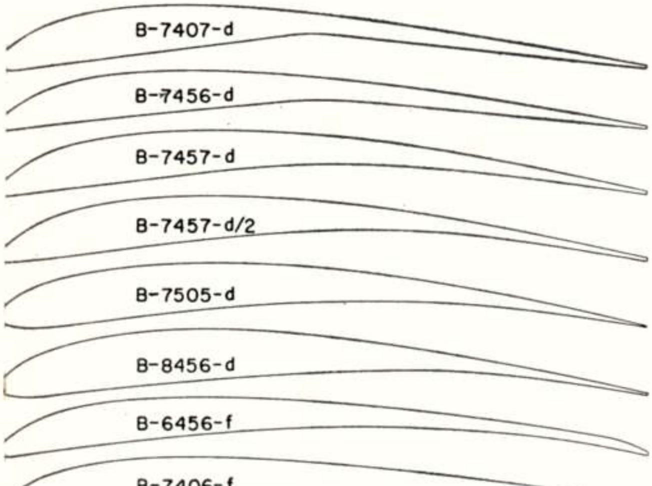
A FURTHER SIXTEEN airfoils to add to the fifteen published in March. These are perhaps of the less conventional type, but each has a specific purpose and if made accurately, can be put to very good use to improve glide performance.

Those with the suffix "d" at the top of the illustrations are developments of the efforts by E. Jedelsky with suffix "e" at the bottom of the drawings. The latter airfoils were created for A/2 gliders and need thin ply or quarter grain balsa to provide the fine trailing edge "flap". For practical purposes, the "d" series permit thicker ribs and spar supports for the rear half of the wing and Benedek 7457 in its two forms has been extremely popular for A/2 work.

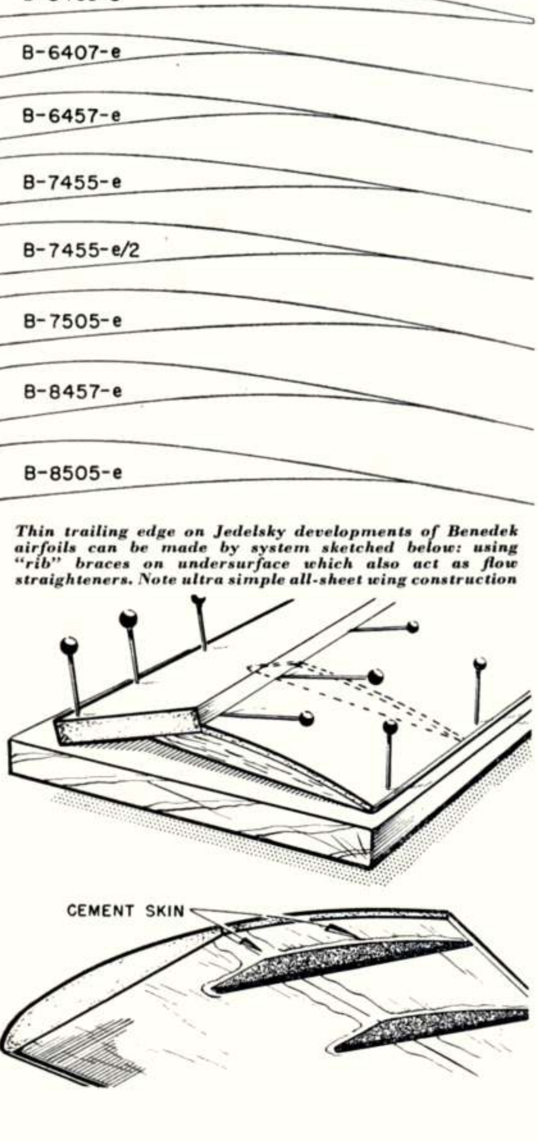
The "f" pair are different in their trailing edge section, which permits sturdy construction at this point and the sharp break in flow apparently helps performance. With B-7406-f, Benedek became first Hungarian to make a steady five-minute average under the old Wakefield rules with 80 grammes of rubber and Lazlo Azor also used it to get steady three-minute average under the current rules with 50 grammes rubber weight.

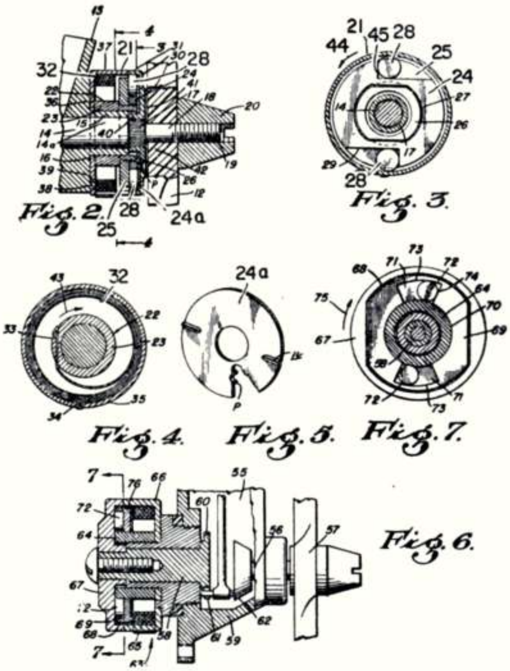
The best Hungarian A/2 models, by Roser, employ B-6456-f and a widely used section for general purpose use, A/1's, etc., where stability is less critical is B-8405-b. With this range of 31 airfoils we have therefore, something to suit all modellers and the sketches presented here will simplify your construction of the selected airfoil.

% CHORD ...	0	1·25	2·5	5	7·5	10	15	20	25	30	40	50	60	70	80	90	95	100
B-7407-d ...	1	3·05	4	5·5	6·6	7·5	8·8	9·55	9·9	10	9·5	8·5	7·2	5·65	4·05	2·4	1·5	0·6
	1	0·15	0·1	0·4	0·7	1	1·6	2·2	2·8	3·45	4·6	5·45	4·6	3·45	2·25	1·1	0·55	0
B-7456-d ...	0·85	2·5	3·45	4·9	5·95	6·7	8	8·7	9	9·05	8·8	8	6·9	5·5	3·95	2·25	1·4	0·5
	0·85	0	0·2	0·45	0·7	0·95	1·45	1·95	2·5	3	4	4·5	4	3	2	1	0·5	0
B-7457-d ...	0·9	2·55	3·55	5·2	6·3	7·2	8·45	9·25	9·8	10	9·85	9·25	8·1	6·55	4·9	2·8	1·7	0·5
	0·9	0	0·1	0·3	0·5	0·9	1·5	2·1	2·75	3·25	4·25	4·9	4·55	3·9	2·8	1·5	0·8	0
B-7457-d/2 ...	0·9	2·55	3·55	5·2	6·3	7·2	8·45	9·25	9·8	10	9·85	9·25	8·1	5·55	4·9	2·8	1·7	0·5
	0·9	0	0·1	0·3	0·6	0·9	1·5	2·1	2·75	3·25	4·25	4·9	4·9	4·3	3·15	1·75	0·95	0
B-7505-d ...	1·7	3·5	4·5	5·75	6·65	7·4	8·4	9·1	9·45	9·75	9·75	9·15	8	6·45	4·6	2·55	1·45	0·2
	1·7	0·55	0·25	0	0·1	0·35	0·9	1·5	2·05	2·55	3·4	3·95	3·95	3·65	2·75	1·55	0·95	0
B-8456-d ...	1·75	3·55	4·5	5·95	6·95	7·6	8·8	9·5	10·05	10·2	10·15	9·2	8	6·4	4·7	2·7	1·5	0·3
	1·75	0·5	0·25	0	0·2	0·45	1·05	1·5	2	2·5	3·2	3·75	4	3·9	3·1	1·8	0·9	0
B-6456-f ...	0·75	2·5	3·6	4·95	6	6·9	8	8·7	8·95	9	8·9	8·3	7·5	6·4	5·05	3·7	2·6	0·5
	0·75	0	0·2	0·5	0·8	1·1	1·6	2·2	2·8	3·25	4	4·5	4·5	4·05	3·3	2	1·1	0
B-7406-f ...	0·9	2·95	3·95	5·6	6·6	7·4	8·55	9·2	9·55	9·65	9·3	8·6	7·7	6·65	5·4	3·95	2·9	0·5
	0·9	0·1	0·1	0·45	0·8	1	1·5	1·95	2·4	2·8	3·4	3·8	3·75	3·4	2·65	1·6	0·9	0
B-8405-b ...	1	2·85	3·9	5·4	8·5	7·45	8·6	9·35	9·75	9·95	9·7	8·95	7·9	6·45	4·65	2·9	1·95	0·7
	1	0	0·1	0·35	0·55	0·75	1·1	1·4	1·8	2·1	2·55	2·9	2·8	2·4	1·85	1	0·5	0
B-6407-e ...	0·8	2·5	3·5	4·9	5·9	6·7	7·95	8·6	8·95	9	8·65	7·7	6·3	4·8	3·2	1·6	0·8	0
	0·8	0	0·2	0·45	0·8	1·1	1·9	2·7	3·45	4·1	5·2	5·9	5·9	4·8	3·2	1·6	0·8	0
B-6457-e ...	0·8	2·5	3·45	4·85	5·9	6·7	7·9	8·6	9	9·15	9	8·25	7·1	5·5	3·75	1·9	0·85	0
	0·8	0·15	0	0·3	0·7	1	1·75	2·5	3·15	3·75	4·8	5·5	6	5·3	3·75	1·9	0·85	0
B-7455-e ...	1·5	3·2	4·1	5·3	6·2	7	7·95	8·5	8·9	9	8·65	7·85	6·55	5·1	3·5	1·75	0·9	0
	1·5	0·5	0·25	0	0·2	0·45	1·1	1·6	2·05	2·5	3·15	3·7	4	3·9	3·2	1·75	0·9	0
B-7455-e/2 ...	1·15	3	3·95	5·2	6·25	7	8	8·55	8·9	9	8·75	7·9	6·45	4·8	3·3	1·65	0·82	0
	1·15	0·15	0	0·1	0·3	0·4	0·85	1·25	1·7	2·1	3	3·6	3·95	4	3·3	1·65	0·82	0
B-7505-e ...	1·5	3·1	4	5·05	6	6·85	7·8	8·4	8·95	9·1	9·1	8·6	7·5	6	4·4	2·3	1·15	0
	1·5	0·5	0·2	0·1	0·1	0·3	0·8	1·2	1·95	2·25	3·1	3·7	4	4·05	3·6	2·3	1·15	0
B-8457-e ...	1·5	3·4	4·4	5·6	6·9	7·75	9·1	10	10·45	10·8	10·4	9·4	8	6·2	4·2	2	1	0
	1·5	0·25	0·1	0	0·15	0·5	1·25	2	2·8	3·4	4·5	5·2	5·5	5	4	2	1	0
B-8505-e ...	1·7	3·6	4·5	5·7	6·7	7·4	8·55	9·2	9·6	9·75	9·35	8·35	6·8	5·15	3·5	1·75	0·9	0
	1·7	0·6	0·25	0	0·1	0·3	0·8	1·2	1·75	2·15	3	3·5	3·9	3·95	3·3	1·75	0·9	0



Thin trailing edge on Jedelsky developments of Benedek airfoils can be made by system sketched below: using "rib" braces on undersurface which also act as flow straighteners. Note ultra simple all-sheet wing construction





IMPORTANT PATENTS

U.S.A. No. 2,855,070 J. W. McROSKEY

Application date 24/6/57

THIS INVENTION provides an automatic recoil type starting device, for miniature engines, which operates without recourse to pull strings, etc. In the device shown in the drawings and specimen, the energy required for rotating the engine crankshaft in a forward direction is accumulated and stored in a coil spring by rotation of the shaft, via the propeller or its equivalent, in a rearward direction. When cleared an almost instantaneous and consistent rotation of the crankshaft is obtained to pass the piston through several compression strokes. As can be seen from *Figs*. 2, 3, 4 and 5, 6, 7, the device may be arranged at either end of the crankshaft. The invention appears to be directed toward the starting of glow-plug fired engines, the operator winds the propeller in the reverse direction and on release, the spring rapidly rotates the shaft in an operative direction.

The mechanics of the invention are best understood by reference to *Figs*. 2, 3 and 4. The casing 21 rotates with the crankshaft as shown by the arrow 44 (*Fig*. 3) and the clutch discs 28 when moved in outward direction in the apertures 25 frictionally engage the inside of the case 21 to make a driving connection with the clutch plate 24. When the shaft is rotated reversely, a subsidiary plate 24A shifts the discs 28 out into engagement and during subsequent rotation of the plate 24 the spring 32 is wound. On release the plate 24 moves in an operative sense, the discs 28 are then urged into engagement with, and transmit torque to the casing 21 and the crankshaft, etc. Overrun of the crankshaft displaces the discs against the shoulder 45 and disengages them from the casing wall as the engine starts.

Camouflage patterns

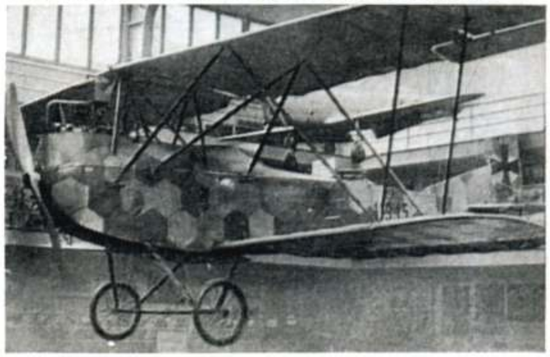
Austro-Hungarian

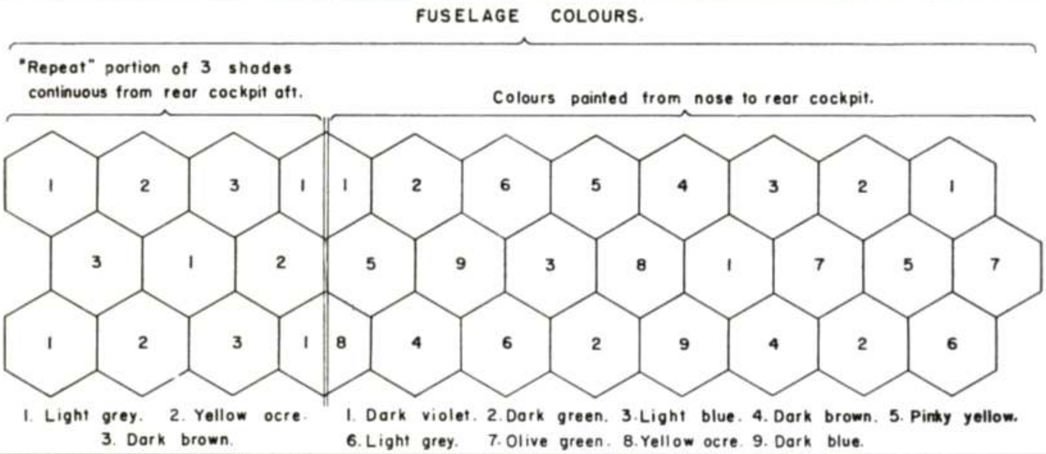
Through the good offices of Mr. Pavel Vancura of Prague, it is now possible to present colour details of the regular hexagon (equilateral) camouflage applied to the Lohner built Knoller C II two-seater, which hangs in Prague Technical Museum. W.W.I. enthusiasts will doubtless already be familiar with this type of camouflage, which was used extensively by the Austro-Hungarian air forces during the latter part of the war. However, until now nothing was known of colour combinations.

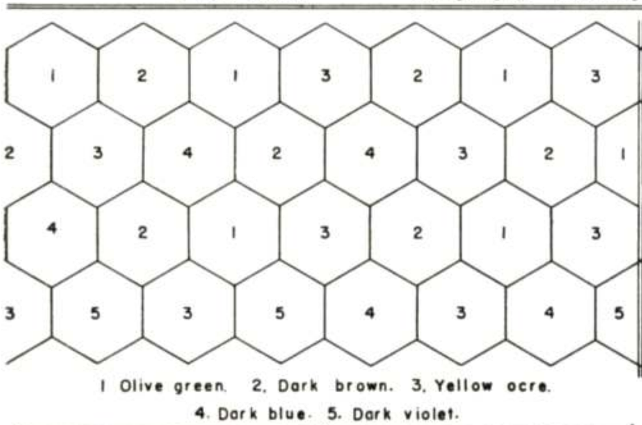
Examples of regular hexagon patterns, below, a Berg DI and at right, the Czech Museum Knoller. Designed by Professor Knoller, the CII was built by Jakob Lohner and Co., Oesterreich-Ungarische Flugzeugfabrik Aviatik, and Wiener Karosserie und Flugzeugfabrik, the two latter firms being known by the abbreviations O-Aviatik and W.K.F. Engine was the Austro-Daimler. Span Upper 10.0 m. Span lower 8.0 m. Length 8.5 m. Height 3.2 m.

The hexagons on the fuselage are painted on, no less than nine shades being used in the pattern from the nose to the rear cockpit, aft of this a "repeat" pattern of only three shades is used. Due to the layers of dust it cannot be certain whether the pattern on the top surfaces of the wings and tailplane is also painted, or pre-printed, on the fabric. It is to be noted that the wing pattern has a five-shade combination of colours whereas the tailplane pattern has only four shades.

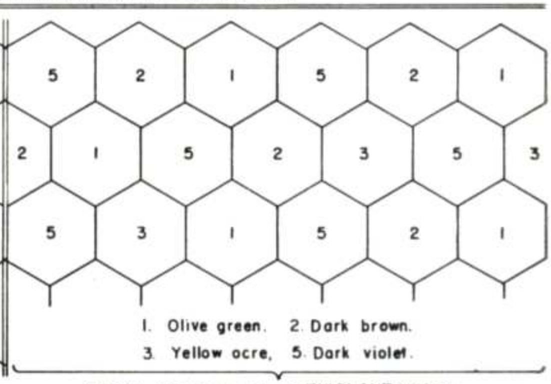
The under-surfaces of the wings and tailplane are clear doped natural linen fabric, *i.e.*, a creamy beige shade and the bottom surface of the fuselage is pale blue. All struts are dark green including undercarriage. The radiator is natural brass and the water pipe to the engine is painted blue. The crosses are of the Patee style and do not have a white outline, or background, as was often the practice with Austro-Hungarian aircraft.





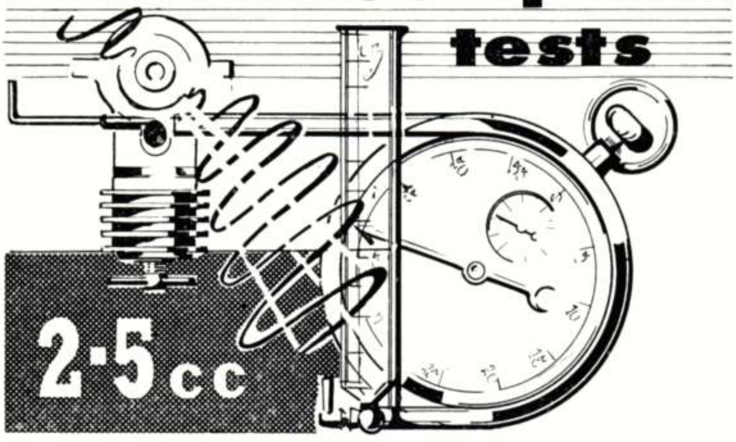


Colour arrangement of WING pattern.



Colour arrangement of TAILPLANE pattern.

Fuel consumption tests



by R. H. Warring

THERE HAVE BEEN numerous demands over the past year or so for fuel consumption data to be included in engine test reports—quite obviously very useful information for team race and, to a lesser extent, radio control applications. The question of measuring fuel consumption on tests is not quite as simple as it appears at first sight. Obviously it is quite easy to *measure* fuel consumption at any particular speed (*i.e.*, with a given propeller size), but to make sure that the measured figure has any practical significance is another matter. There are so many factors which can affect fuel consumption.

First, with regard to actual measurement technique, some tentative designs for a flowmeter were investigated which would give instantaneous flow at any instance, but since these depended on the use of a calibrated jet orifice and readings would be affected by the viscosity of the fuel, it was ultimately decided that the simplest possible technique would be the best—merely using a calibrated length of plastic fuel tubing and timing the duration of engine run "between marks". This has subsequently proved easy to work and consistent.

The main variables found to affect the timed run on a constant metered quantity of fuel are the fuel formula and the needle valve setting, the latter in particular having a marked effect. These two factors were investigated in detail separately.

Dealing first with the question of needle valve setting, minimum fuel consumption is obviously realised with the leanest possible mixture on which the engine will run. The factor then emerges that the needle valve on all engines can be opened appreciably from this "maximum lean" setting—often to a very considerable extent—without any effect on the r.p.m. figure. It is possible, in fact, to establish settings over a "band", all giving the same performance (*i.e.*, the same r.p.m. with a given propeller load), ranging from "maximum lean" to "maximum rich", beyond which latter point further richening of the mixture does result in some loss of r.p.m.

Considering the other main variable, the fuel formula, this does not appear to have as much effect as might be thought. Certainly it is nothing like as significant as needle valve setting.

The principle dope for diesel fuels is, of course, amylnitrate or amylnitrite. A small proportion of dope—*e.g.*, around 2 per cent.—is widely used to improve engine flexibility and a slight higher proportion often improves running characteristics at high speeds. Beyond about 4 per cent. addition however, no useful results are derived.

There are other fuel additives, however, which have a "depressant" effect on fuel consumption without affecting performance A proportion of nitrobenzine added to the fuel will enable the engine to run on a slightly leaner mixture setting with virtually no detectable effect on performance. This is effective up to about 3 per cent. nitrobenzine, when further addition seems to have no more effect and if continued to be added will eventually reduce performance (when the fuel consumption will again tend to fall).

Whilst as a generalisation, nitrobenzine would appear a very useful additive to team race fuel mixture, it does not follow that it will give similar savings on all engines.

Specific fuel consumption is also plotted for each engine, based on c.c. consumption per B.H.P. developed per second, covering a nominal range of operating r.p.m. from 8,000 to 16,000. The particular significance of this curve is that its shows a minimum value for fuel consumption in terms of power delivered at an r.p.m. figure almost invariably lower than the normal operating r.p.m. of the engine and certainly below its peak r.p.m. The form of the curve approaching the higher speed range is also significant. In some cases specific consumption rises very sharply, in others not so rapidly.

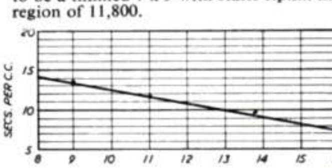
All the consumption figures extracted relate to a nominal "maximum lean" mixture for the needle valve setting for each propeller load used. Propeller sizes were selected to give readings at approximately 1,000 r.p.m. intervals over the range 8,000 to 16,000.

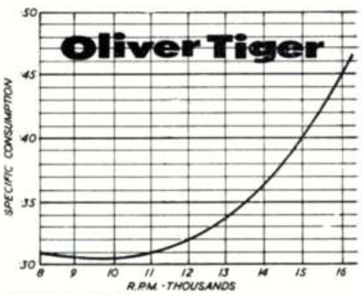
The interesting fact arises, incidentally, that the ratio between actual swept volume and the volume of solid fuel which passes through the engine in the same period, lies in the ratio of something like 4,000 to 5,000 to one!

Notes on individual engines related to graphs and tables.

OLIVER TIGER 2·5

Acknowledged "master" of the team race field, the Oliver proved very consistent in running on a 4 per cent. nitrated fuel and easy to establish needle valve settings. Measured fuel consumption figures for "maximum lean" setting also followed the mean line closely, and slow running was established with a very lean setting, resulting in the fall off in the specific consumption curve instead of the normal "valley" shape' Measured static r.p.m. with a 6 x 9 Tiger propeller was 16,000. The best size of propeller for team race work would appear to be a thinned 7 x 9 with static r.p.m. in the region of 11,800.





ENYA 15 D (2·5 c.c. diesel)

Another smooth running engine with a consistent, high performance, the Enya shows a marked increase in specific consumption with increasing r.p.m. Most economical running is achieved at a comparatively low speed—around 10,000 r.p.m. Fuel consumption figures measured were consistent and the following propeller-r.p.m. figures were achieved:—

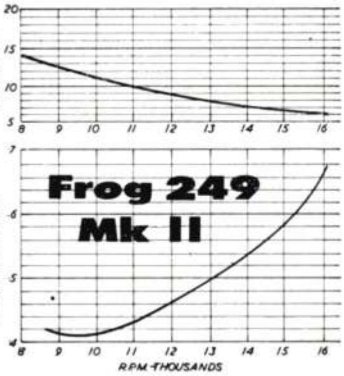
		r.p.m.
9 x 6	(Frog nylon)	10,100
8 x 8	(Trucut)	9,000
7 x 9	(Trucut)	11,400
7 x 8	(Stant)	11,600
6 x 9	(Tiger)	15,000

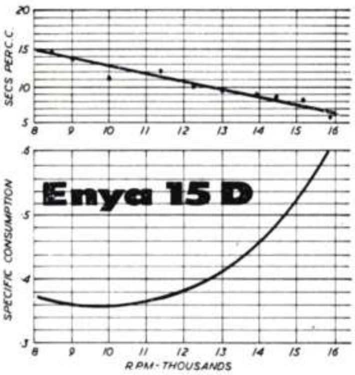
R.P.M.	B.H.P.	Seconds on 1 c.c.	Duration on 10 c.c.	Duration on 15 c.c.	c.c. per B.H.P. per sec.
OLIVER TIGER 2·5 c.c.					
8,000	·225	14·2	2:22	3:33	·31
9,000	·24	13·4	2:14	3:22	·31
10,000	·265	12·5	2:05	3:07	·305
11,000	·28	11·6	1:56	2:54	·31
12,000	·29	10·7	1:47	2:40	·32
13,000	·305	9·8	1:38	2:27	·335
14,000	·31	9	1:30	2:15	·36
15,000	·305	8·2	1:22	2:03	·40
16,000	·28	7·2	1:12	1:48	·50
RIVERS SILVER STREAK 2·5 c.c.					
8,000	·18	12·5	2:05	3:08	·45
9,000	·20	11·3	1:53	2:50	·44
10,000	·215	10·4	1:44	2:36	·45
11,000	·23	9·5	1:35	2:23	·46
12,000	·245	8·6	1:26	2:09	·475
13,000	·255	7·7	1:17	1:55	·51
14,000	·265	6·8	1:08	1:42	·57
15,000	·275	5·8	:58	1:27	·63
16,000	·275	4·9	:49	1:15	·74
O.S. MAX 15					
8,000	·15	9·4	1:34	2:21	·71
9,000	·17	8·9	1:29	2:14	·66
10,000	·19	8·5	1:25	2:08	·62
11,000	·205	8·0	1:20	2:00	·61
12,000	·22	7·6	1:16	1:54	·60
13,000	·23	7·2	1:12	1:48	·61
14,000	·235	6·8	1:08	1:42	·63
15,000	·235	6·4	1:04	1:36	·67
16,000	·225	5·8	0:58	1:27	·77
ENYA 15 GLO					
8,000	·15	8·0	1:20	2:00	·84
9,000	·16	7·5	1:15	1:53	·81
10,000	·185	7·0	1:10	1:45	·77
11,000	·20	6·6	1:06	1:39	·75
12,000	·22	6·2	1:02	1:33	·73
13,000	·225	5·8	0:58	1:27	·75
14,000	·23	5·4	0:54	1:21	·80
15,000	·22	5·0	0:50	1:15	·91
FOX 15					
9,000	·15	11·6	1:56	2:54	·575
10,000	·18	11·0	1:50	2:45	·51
11,000	·20	10·5	1:45	2:37	·48
12,000	·21	9·9	1:39	2:29	·48
13,000	·215	9·3	1:33	2:20	·50
14,000	·215	8·7	1:27	2:10	·54
15,000	·20	8·1	1:21	2:01	·62
16,000	·175	7·6	1:16	1:54	·75
17,000	·14	7·0	1:10	1:45	1·02

FROG 249BB (MODIFIED)

This is an engine which has come well to the fore in recent seasons, having been "hotted up" from the original version without, it seems, sacrificing desirable consumption figures. There is, however, a noticeable rise in specific consumption from the minimum achieved at around 10,000 r.p.m. Typical static r.p.m. figures achieved:

		r.p.m.
7 x 8	(Stant)	11,200
7 x 9	(Trucut)	10,400
6 x 9	(Tiger)	14,500



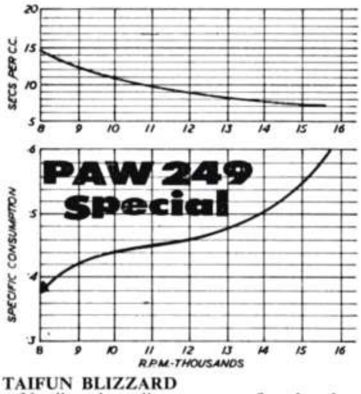


See page 281 for comments

P.A.W. SPECIAL

Ostensibly, we were told, this was a free-flight engine designed for high fuel consumption to give quick "engine cut" characteristics. Actual consumption however, seems very much on the moderate size and this engine has, of course, been used with success for team racing. A very lean setting could be established for slow speed running (8,200 r.p.m. on a 8 x 8 Trucut) which pulls the specific consumption curve down. Specific consumption then rises only moderately up to 13,000 r.p.m. so that the form of this curve is excellent. Test propeller—r.p.m. achieved:—

		r.p.m.
7 x 9	(Trucut)	10,000
7 x 8	(Stant)	11,000
6 x 9	(Tiger)	15,500



TAIFUN BLIZZARD

Needle valve adjustment was found to be very critical for minimum lean setting with the reed valve induction on this engine. There was a very small difference between minimum lean and the cut-off point. Considerable variation in consumption figures was possible at the lower speed and by varying the needle position a single notch only at a time, accounting for a difference of as much as 8 seconds at 7,500 r.p.m.

E.D. 2·46 RACER

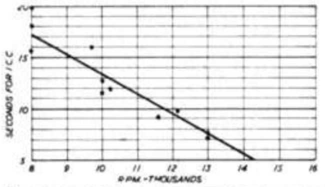
This engine, as tested, was fitted with the new E.D. barrel-type throttle. It was checked that the consumption on normal setting was identical with that with the standard spraybar assembly. The throttle was found very effective in action, giving approximately 50 per cent. speed reduction with various propeller loads tried, *e.g.*, from 10,000 r.p.m. down to 5,000 r.p.m' on a 9 x 6 Frog nylon propeller. A slight flat spot was apparent over the range of throttle movement (leaning out) which could be cured by slight trimming of the barrel (this sort of fine adjustment is likely to be "individual" to particular engines).

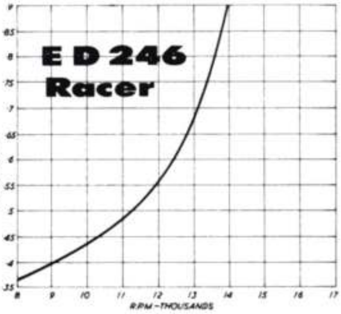
O.S. MAX "15"

Although glow motors are notoriously more greedy than diesels, the O.S. Max "15" on static test does not appear excessively so. The specific consumption curve also shows a fairly shallow form with a minimum value at 12,000 r.p.m. Due probably to the wider needle opening the setting for minimum lean mixture is less critical than with diesels and thus there is more tolerance on setting for absolute minimum consumption. The gradiant of the consumption curve against r.p.m. is also quite shallow.

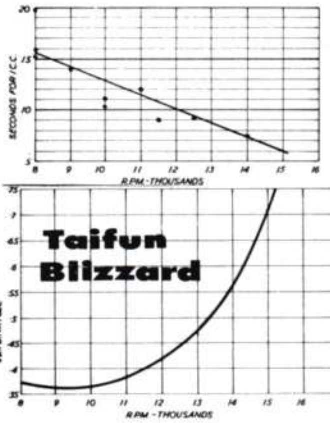
Glow/diesel

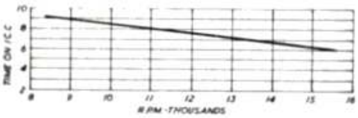
An interesting experiment—and one which could have considerable significance, was tried out with the O.S. Max "15" engine.

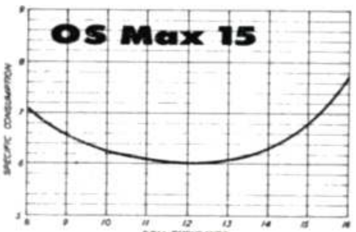




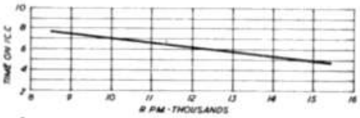
Using an 8 x 4 propeller giving a static r.p.m. figure of 13,500 on standard glow mixture (undoped), the engine was then run on *diesel* fuel. To maintain running it was necessary to keep the battery connected to the plug, but running was quite steady and the r.p.m. figure very slightly up at 13,600. Duration on 1 c.c. of *diesel fuel* for the same load-speed was 16·5 seconds as compared with 7 seconds achieved running on glow fuel—an improvement in the consumption figure of over 200 per cent. The needle had to be closed some three turns over the running setting established for glow fuel, to establish optimum lean setting for the diesel fuel, a sure indication of economy effected.

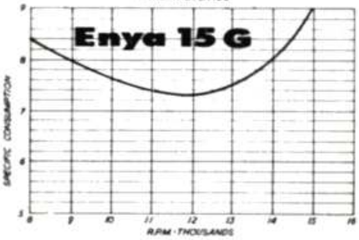






On this basis the engine could be run with glow ignition on diesel fuel to give the same performance with the duration on a limited fuel supply more than doubled, and in fact, reaching a figure which is better than that achieved with diesels. The fact that the glow plug had to be continually connected to the battery was a convenience and any model could easily carry a rechargeable DEAC 225 N.C. cell. Many glow motors will run on diesel fuel in the conventional glow-motor manner and probably this would have been arranged in this case by modifying the diesel fuel proportions to increase the running temperature of the plug element

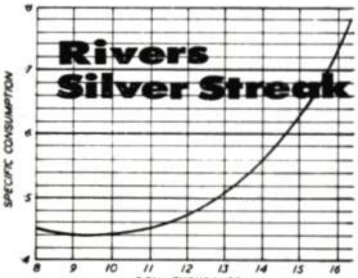




(*e.g.*, reducing the ether content). Alternatively a modification of compression ratio might have achieved the same effect.

ENYA "15" GLOW

This engine showed rather less favourable characteristics—a higher fuel consumption and higher specific consumption, the latter again yielding a minimum value at 12,000 r.p.m. Doped fuel is definitely necessary for high speed running.



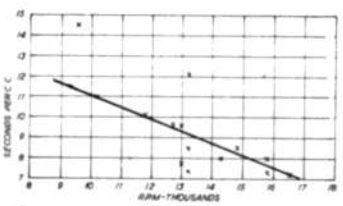
See April Engine Analysis for comments and consumption graph

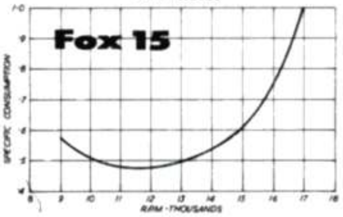
FOX 15

Needle valve setting proved fairly sensitive on 13 per cent. nitromethane fuel (Mercury No. 7) and a consistent run could not always be obtained on minimum lean setting. It was therefore usually necessary to adopt a slightly rich setting at most load-speeds.

A considerable degree of scatter is apparent on the graph, but the mean curve drawn appears to approximate closely to typical average settings which produce consistent running over a reasonable duration. The curve is also substantially of constant gradient, unlike some glow motor curves which tend to show less variation in consumption with speed.

Specification consumption shows a marked

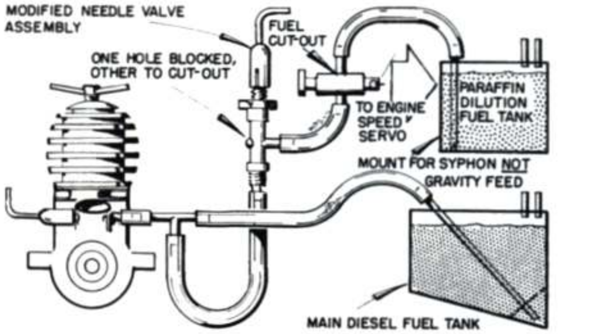




minimum value in the range 11,000-12,000 r.p.m. load-speed and rises sharply with increasing speed.

It was also established that the Fox "15" would start and run on standard *diesel* fuel with a speed loss of approximately 5-10 per cent. for any given propeller load and an improvement in the fuel consumption figure of approximately 50 per cent. Below 13,000 r.p.m. load-speed the Fox "15" would run on diesel fuel with the glow plug disconnected. Above that speed the glow plug had to be left connected continually for consistent running.

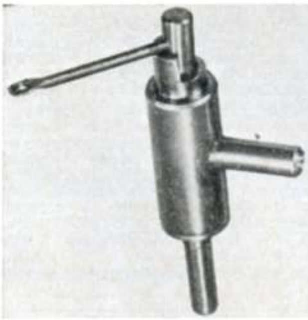
R.P.M.	B.H.P.	Seconds on 1 c.c.	Duration on 15 c.c.	c.c. per B.H.P. per second
E.D. 2·46				
8,000	·15	18	4:30	·37
9,000	·164	15·3	3:50	·40
10,000	·172	13·4	3:20	·44
11,000	·184	11·4	2:50	·48
12,000	·19	9·5	2:21	·56
13,000	·195	7·5	1:52	·68
14,000	·2	5·5	1:22	·91
FROG 2·49 BB (Modified)				
8,000	·18	14	3:30	·39
9,000	·20	12	3:00	·42
10,000	·22	11	2:45	·41
11,000	·23	10	2:30	·43
12,000	·24	9	2:15	·46
13,000	·245	8	2:00	·51
14,000	·25	7·4	1:51	·54
15,000	·255	7	1:45	·57
16,000	·25	6	1:30	·67
PAW SPECIAL				
8,000	·175	15	3:45	·38
9,000	·195	12	3:00	·43
10,000	·212	10·8	2:42	·44
11,000	·228	9·7	2:25	·45
12,000	·240	9·0	2:15	·46
13,000	·248	8·5	2:07	·47
14,000	·250	8·0	2:00	·50
15,000	·240	7·5	1:52	·55
16,000	·212	7·0	1:45	·67
ENYA 15D				
8,000	·18	15	3:45	·37
9,000	·20	14	3:30	·36
10,000	·215	13	3:15	·36
11,000	·225	12	3:00	·37
12,000	·24	11	2:45	·38
13,000	·245	10	2:30	·41
14,000	·25	8·8	2:12	·46
15,000	·25	7·5	1:52	·53
16,000	·29	6·3	1:34	·67
TAIFUN BLIZZARD				
8,000	·175	15·5	3:53	·37
9,000	·195	14	3:30	·365
10,000	·213	13	3:15	·36
11,000	·228	11·5	2:52	·38
12,000	·239	10	2:30	·42
13,000	·242	8·7	2:10	·47
14,000	·238	7·4	1:51	·57
15,000	·234	6	1:30	·71

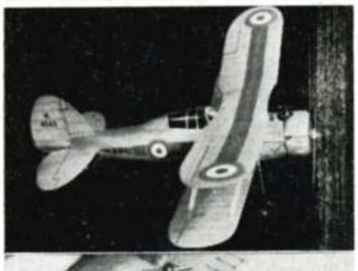


ENGINE SPEED CONTROL by means of fuel dilution is used by H. G. Lauritson of Cardiff with his "Galloping Ghost" *Sparky*. Engine servo introduces a metered supply of paraffin which effectively reduces engine power for a controlled descent. Can be commended for diesels without provision for exhaust or intake choke, and does not appear to affect lubrication.

TRADE NOTES

BUSINESS IS BOOMING WITH MANY NEW KITS & ACCESSORIES



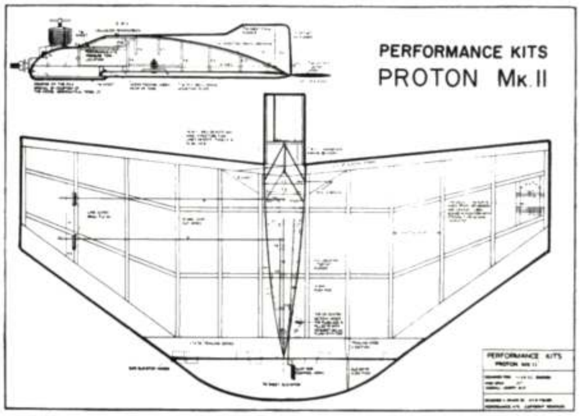


ONE MIGHT WELL ASK what place a locomotive has in AEROMODELLER columns: but we must confess that the new **Rosebud Kitmaster** plastics had us so tempted we simply could not resist making one up. Choosing the American General for its colourful realism, we were more than pleased with the final result, and at only 6s. 6d. it represents fine value which we are sure will appeal to aeromodellers and start a new collector's craze. To date there are six in the range, from the famous "Rocket" to a schools class 4-4-0 "Harrow". **International Model Aircraft** should be very pleased with the Caravelle (1/96th, 12s. 6d.). The novel rear-mounted jets (*see picture, left*) characterise this bold French airliner design, and enhance appearance. Above the tail view is a picture of the Focke-Wulf 190 made from the 2s. 9d. W.W. II series of 1/72nd fighters put out by **Frog** which deserve commendation for accuracy, and can be decorated most authentically with transfers provided. The F.W. 190 forms an ideal companion on our test bench with the **Airfix** Messerschmitt Me.110 (*see above*). This is in the 3s. series, while the latest addition to the 7s. 6d. range is a 107 piece kit for the Bristol Superfreighter. Many modellers will have experienced the pleasure of crossing the Channel by Silver City service, and the Freighter will be very popular as a memento as well as being one of the most detailed plastics on the market.

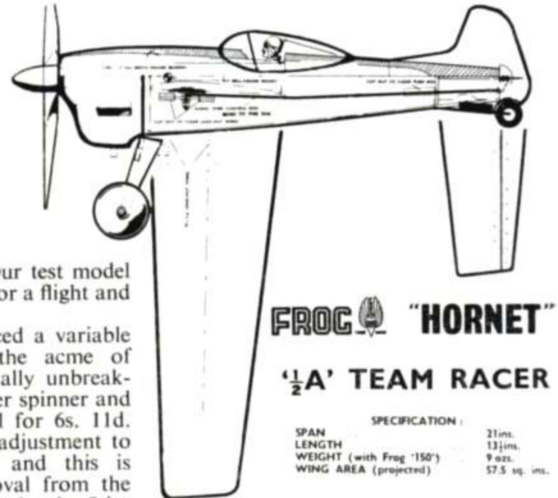
While on the plastic subject, we thought you would like to see (*at left*) one of the latest American kits by **Aurora** for the Avro Arrow. We emphasise that it is not yet available on the British market.

Messrs. A. A. Hales Ltd. have now moved to their spacious new factory at Potters Bar, and will soon be enlarging their well-established **Yeoman** range; but for our money (6s. 11d.) the all-sheet Gloster Gladiator kit gives as much fun as anyone would want. See pictures at bottom left for details of how we mounted a D.C. Bambi diesel to fly this tiny two-ouncer with surprising performance. A new item from the Isle of Man factory of **Davies Charlton** is the Snapstop cut-out valve (*at top*). This is the direct result of consultation with expert modellers, and offers many advantages, not the least of which is its spring-loaded plunger action to positively seal off the fuel flow and give immediate cut-out action on the engine. It will fit any engine, and by making an adaptor collar with brass tube, can be soldered to the needle assembly and thus used to advantage by providing a direct fuel line back to the tank from the cut-out inlet.

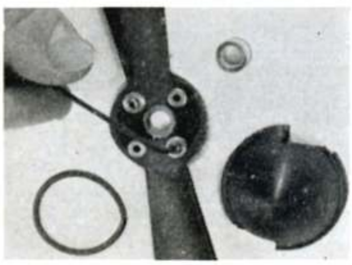
Right: new kit from Coventry features flat wing and unusual "cell" structure. Left: The Bambi-powered Gladiator from an all-sheet Yeoman kit. Above: Plastics parade and the new Snapstop cut-out by D-C



Left: Rosebud Loco has us enthused, and Mercury Star props with detachable nylon blades are great modelling aid. Right: New Frog Racer kit will be popular, has already done well in contests



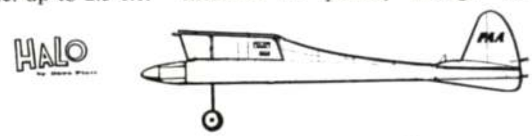
Mercury announced their new range of nylon props last month and now that we have had an opportunity of testing them on a range of engines, we can confirm the claim that the three-blade series definitely damp out vibration. As the picture above shows, the blades are replaceable, each fitting tightly in a cleverly designed hub, and calling for a spot of pressure to engage the boss. A razor blade will remove any excess moulding "flash", but there's no need to trim down the main body

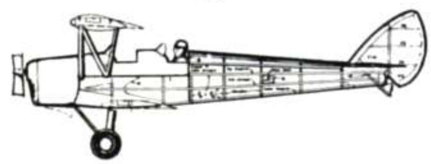


of the blade root as they are designed to be a tough and tight fit. At 7s. 9d. with spare blades at 1s. 9½d. they'll appeal to control-line scale fans, especially those making the latest (and finest yet) Mercury kit for the Lockheed P-38 Lightning. This is beautifully produced, with sectioned solid balsa wings (selected light grade) authentic plans and transfers, clever design features and very robust construction. Our test model will soon be airborne for a flight and building report.

Charon have produced a variable pitch prop that is the acme of simplicity, yet is virtually unbreakable, comes with rubber spinner and Allen key adjuster, all for 6s. 11d. Photo shows how an adjustment to pitch can be made, and this is possible without removal from the engine, too. One can twist the 8-in. diameter blades from 1-in. to 8-in. pitch with ease, and so trim the model for thrust, maximum climb or, in the case of a control-line model, for peak speed tests. It fits any engine from 1 c.c. up to 2.5 c.c.

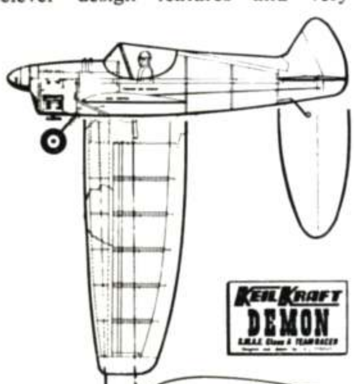
Left: Charon VP prop is simple yet effective for free flight or c/l. Right: New KeilKraft kits under review for Payload or sport, and scale rubber



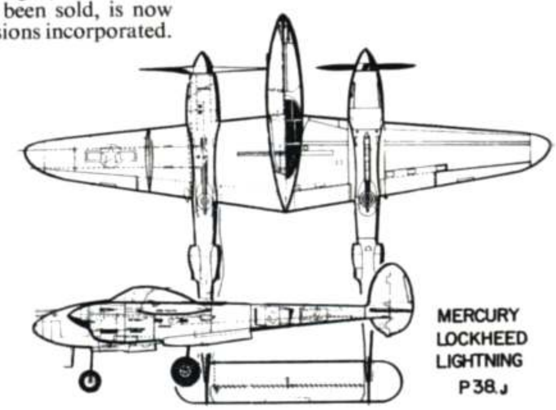


Harleyford Publications Ltd. announce another title for their range, "Air Aces of the 1914-1918 War" and we look forward to reviewing this new publication with its impressive listing of specialist authors. We also understand that the third print of "Aircraft Camouflage and Markings", of which 9,000 copies have been sold, is now available with revisions incorporated.

Sebel Products Ltd., manufacturers of Jetex kits and motors announce their new formula fuel at a popular price of 1s. 11d. for 20 pellets. Our tests prove a slight increase in power, though for shorter duration (7 secs. average) in the 50 size, but the greatest change is in the temperature of combustion. For this reason, new motor cases are to be issued via the model shops, and a new motor, the 50C will appear with augmenter tube. The new fuel is to be sold in all sizes, and is a happy move to cheaper flying.



Left: KeilKraft are hot on the market with the first F.A.I. Team Racer to suit latest rules. Has attractive lines and is very complete, including wheels, tank and bent u/c. Same completeness extends (only twicefold) in de Luxe version of Mercury's P-38 at right



RULE BOOKS are the lifelines about which contest modelling revolves. The S.M.A.E. handbook is free to all full members on proper application through club secretaries and can be purchased by individuals for 2s. 6d. on application to the Society at Londonderry House, Park Lane, London, W.1. Yet surprisingly few people take advantage of obtaining a personal copy of the "Bible"—perhaps it is because the average modeller is unaware that such a valuable reference book is available.

In the R.A.F.M.A.A. a similar situation exists, and in their case it is all the more pity since the R.A.F.M.A.A. Handbook (8th edition just out for 1959) is a 72-page classic of completeness. Copies are issued through Command representatives, and they cover everything from equipment, Insurance, Supplies and Records through to Organisation Procedure and the current year's programme.

Incidentally, I am asked to point out to R.A.F. flyers that Free Flight Scale and Class B team are "out" this year (p. 56 and 61) for the R.A.F. Championships.

Why not get "genned up" and seek your appropriate rule book today—before the contest arguments arise.

Western

Results of the West of England C/L Champs. on March 8th were:

Combat 28 entries.

Bath Abbey Shield
1st Ballington (Exmouth)
2nd John (Weston-super-Mare)

Team Combat
1st Weston-super-Mare
Equal 2nd (Bristol Aces and Bath)

T/R ½A — 1st Steer (Glevum); 2nd Rudd (Dursley)
T/R A — 1st Wyatt (Glevum); 2nd Langley (S.Bristol)

Stunt: Langley (South Bristol)

Regular club meetings of **SWINDON M.A.C.** are held every Thursday at 15 Faringdon Road at 7.30 p.m. Any *KEEN* aeromodellers are welcome and flying takes place every week-end at Wroughton R.A.F. Station. A special new area has been secured for C/L stunt and team-race circles.

WESTON-SUPER-MARE M.A.C. held ½A combat on April 5th, Lance Bell of Bristol winning. The club would like to see this class of combat at some of the larger rallies, as it was very successful. The younger members who find Class A combat rather expensive found that ½A suited them admirably and they were able to join in the fun.

BRISTOL R.C.M.A.C. concluded their Carroll Trophy. This contest was spread over six months and provided some variety, nomination, course steering over 440 yards each way, a "scramble" (get in as many circuits and spot landings as possible in 10 min.), aerobatics, etc. Contest was won by Cyril Needham, flying single-channel; the runner-up was John Mardon flying multi-channel.

EXMOUTH AND D.M.A.C. member Pete Williams did well to take first place in both Power and Rubber at the club "aggregate" contest. Longest flight of the day was an unofficial one by Club Sec. Den Baudet. With d/t fuse fitted but "unlighted" his *Woodford Special* went away for 15 minutes. When he reached the touch-down spot 2½ miles away he was told the model had been returned to the flying area by a passing motorist!

Devon Rally. Entrants for the Combat event at this year's Rally are advised to arrive early. The draw will take place at 12.30 p.m., first heat will be away at 1 o'clock.

London

Five members of **FELTHAM EAGLES M.A.C.** braved the wet and windy conditions of Dagenham's Easter Combat Rally. Of these five, four were left in the last few when the elements made it necessary for the winners to be drawn out of the hat, but the prizes didn't go Feltham way.

MILL HILL M.A.C. ran their annual rubber contest at Copthall Playing Fields in March, M. Barton taking the honours.

SIDCUP held an exhibition on March 21st in aid of the 8th Sidcup (Handicapped) Scouts, which resulted in a profit of about 30s. The models in the exhibition were of a high standard, most of them being plastics. The new Sidcup transfers have arrived. If any collectors want them they can write to: D. Williams, 46 The Avenue, St. Paul's Cray, Orpington, Kent, price 4d. each.

FARNBOROUGH M.A.C. had their second club comp. of the year and both M. Brown's new Oliver-powered *Siskin* and J. Harris's *Hot Pot VI*-powered by a 3·5 c.c. special came through with a perfect score, the latter model winning the fly-off.

FALCON'S (EAST ACTON) M.A.C. are a new club and interests are mainly control line, stunt combat and "B" team race.

Membership of **WANSTEAD M.A.C.** now stands at 19. Some of the more hardy combat enthusiasts entered the Dagenham combat competition, and Len Soanes was lucky to collect the £5 prize when the winner was decided by a draw, due to very bad weather—Lucky Len!

At the **NORTHWOOD M.A.C.** speed comp. on March 1st Pete Perry took first place in both 2.5 and 5 c.c. and he also came second in the 1·5 c.c. event—keen lad!

South Midland

A.R.C.C. tried to hold a meeting at Chalgrove on Easter Sunday. The windy and wet conditions prevented the new rules being used, these set out times for tuning and testing before the contests. Chris Olsen showed that his *Uproar* could perform very well even in a high wind, and four other models took the air for short flights in the rain (including Peter Lovegrove's Aerotone prototype). A most interesting display was the printed circuit German-made equipment put on by Ed. Johnson.

A tip from the **NORTHAMPTON M.A.C.** Newsletter is to use cloakroom tickets for S.M.A.E. registration numbers. A 4d. book covers the needs of a club! Dope them on with thick dope and apply a protective coating.

BISHOPS STORTFORD D.M.A.C. have been given a clubroom in the "Half Moon", and membership has increased. This was evident at the Dagenham Combat Rally where they made five entries.

Incidentally, the landlord of the "Half Moon" is a keen solid modeller and the public bar is decorated with many fine examples of his work, underneath which is a notice saying "There is a drink on the house if you can recognise these". So if anyone else wishes to join the club, meetings are at 8 p.m. on Fridays.

STEVENAGE are changing their clubroom which will be used every Tuesday at the Broadhall Community Centre, Hydean Way, Stevenage. Now that Pete and Mavis Giggle have joined them from Southampton there is an improvement in club contest performance this year. On June 27th they are putting on a demonstration of C/L flying to an expected crowd of 5,000 at the Open Day of I.C.I. Ltd., Welwyn, in conjunction with the Hatfield club.

South Eastern

EAST GRINSTEAD M.F.C. crammed 21 members plus models on the back of a small builder's lorry for April 5th. Surprisingly, on the subsequent journey to Ashdown Forest no one fell overboard.

Richard Vincent's new *Y-Bar* (A-M 15) started going places with 3:46 off 6 secs. engine run, then it did 10 mins. o.o.s. off the same engine run. Another club record went when secretary Les Fuzzard's *Creep* (A-M 35) did 3:15 off 10 secs. run, but the engine was not at its best; this is only a start they tell me.

NORTH KENT NOMADS held a *Concours d'Elegance* which was well supported. The winners were: Senior—Ivor Bittle with his own design single channel four control aeroplane *Canwag*. This model is unique in that its actuator is a cross between a Laurie Ellis Escapement and a Howard Bonner Varicomp. Needless to say it was home-made. First place in the Junior Concours went to young Petty with a well-made combat control line model.

At a recent jumble sale one of the items included six beautiful propellers suitable for large R/C planes, at 3d. each. One member, rather greedily, bought the lot, later to discover that they were all left-hand propellers ! !

East Anglia

April 12th saw the biggest crowd of "modellers" ever on **CAMBRIDGE M.A.C.** flying field, when they were visited by R.A.F. Marham and Kings Lynn M.A.C.s who competed in a "friendly" combat session. The meeting was a success in spite of strong winds, and the first three places were taken by Cambridge members. (Fiddle!) In the second round Impington M.A.C.'s pit crew resorted to flinging their completely U/S model at their opponent's in a last desperate attempt to get at his streamer, and Mike Hobbs was all but scalped when a model passed over his head at 0 feet as he pitted for a Cambridge entrant in the final round.

Northern

A new club has been formed as the **HARROGATE M.F.C.** and was started about six weeks ago as most of the teenage aeromodellers in Harrogate were suffering from the age-old problem of building space. The clubroom (a hired garage) is only small, and the rent is high at £1 per week plus 4s. per week electricity charge and therefore the subscriptions have to cover. Blimey! Wish I could let a garage for that handsome rent !

On Friday, March 13th (ominous date) a *Concours d'Elegance* was held in **HUDDERSFIELD D.M.A.C.** clubroom; free refreshments were provided by the club and the attendance was pleasing. The contest was judged by Flt.-Lieut. Taphouse, C.O. of the local Air Training Corps. The results were: 1st, E. Kelly; 2nd, A. Norcliffe; 3rd, G. Mackrell.

On the following Sunday, March 15th, the club were hosts to Mansfield M.A.C. for a combat competition. Out of nine combats Huddersfield won only one, but much valuable experience was gained.

Third Annual Exhibition of models organised in part by the **SHEFFIELD S.A.M.** is to be held at St. Mary's Community Centre, Bramall Lane, Sheffield 2, on May 20th, 21st, 22nd and 23rd, 1959—entries are currently invited so get cracking.

On March 29th **WHARFEDALE D.A.** visited R.A.F. Linton-on-Ouse. Due to bad weather conditions very little flying was done but the few flights which were made by the team race and combat enthusiasts proved successful in spite of the atmospherics.

East Midland

FORESTERS congratulate Dave Bainbridge on winning the Halfax Trophy. Their membership now stands at 63 which is the highest for some years and among the models they have an "Astro-hog" in the club fitted with home-built dual simultaneous 8-channel equipment.

Midland

SUTTON COLDFIELD M.A.C. is a new club with obvious interests—they hope to be seen at all the contests.

The local Council for **HUCKNALL D.M.A.C.** have shown a keen interest in the club, and have put a field suitable for

C/L flying at their disposal, also in the near future a Nissen hut will be rented to them for use as H/Q/ This is a great incentive to the members, who are keen to get some combat practice for the new season.

Palmer-type stunt jobs are popular in **WEST BROMWICH M.A.C.**, among them being a *Thunderbird*, a couple of *Smoothies*, a *Pow-Wow* and a *Calamity Jane*. The F/F boys are also busy trimming. Notable are the A/2s of Mac Grimmett and Dave Wilkes, which, as well as being good flyers, are finely constructed.

The Annual Glider comp. for the **OUTLAWS (CANNOCK) M.A.C.** Howard Wood Trophy was held recently and three hardy members left their combat jobs at home and partook of the athletic pastime of "chuck and run". The traditional gale blew and winner for the last two years, Roy Lockley, lost his A/2 on its first flight. After a good first round score, Gordon Bentley broke his wings and Gordon Burton, with a little Mercury *Gnome* which was too light to bust and too small to go very far, had an easy win. Just goes to show ! !

A most successful Rally was held by the **GEE DEE M.A.C.** at R.C.A.F. Langar on March 29th. In spite of very poor weather conditions, members from sixteen Midland clubs attended, and a most enjoyable—if somewhat damp—time was had by all. Because of the weather, the Stunt and T/R events had to be cancelled, but an excellent Combat competition was run off, the winner being M. E. Bates of the Nuneaton M.A.C., who received a Fox 15 as prize.

The club is now the proud possessor of a mobile caravan unit which they hope will be seen at many forthcoming rallies.

A recent crisis in **WALSALL M.A.C.** due to the rift between F/F and C/L members is now settled and things are normal again. The result seems to be a slight increase in F/F interest. In the D/C Hamley Trophy, C. Petty looked all set with an impressive score of five maxs, only to learn that everybody else had flown to the three 4-min. max rule while he had five 3s ! Model was a Fox 19 *Spacer*. D. Pym, flying his O/D Webra design, got one max then someone else's model pranged on to the Webra job—and that was that. Altogether a disastrous day!

North Western

A number of **LIVERPOOL M.A.C.** models were entered in the *Model Engineer* Exhibition at Manchester. Ralph Hunt and Dougy Evans bagged 1st and 2nd places respectively with a *Loening Seaplane* and Doug's *S.E.5a*. Well done lads.

They have lost their Australian member for the next three months, as Bernie Shenks has gone awandering on the Continent. These Aussies must have itchy feet.—(Just as I wanted to contact him, too—I have an engine of his!)

Due to the number of enquiries received they are forced to point out that Woodvale and Burscough 'dromes are only available to club members according to Air Ministry rule.

WALLASEY M.A.C. members John Hannay and Stan Hinds finished 1st and 2nd respectively in the Area A/2 Elims. Stan also came 2nd in the K. & M.A.A. Cup. Due to sheep lambing at the moment on the club field, most of the club flying is being done at Tilstock, 50 miles away. It doesn't leave much time for flying, but as John Hannay always says, "It's a nice run!"

First National comp. win in **SHARSTON D.M.S.** came with E. Helliwell (*Inch Worm*), who has won the K.M.A.A. Cup.

Wales

Frequent contests are now being held by the **CARDIFF M.A.C.** at Ely racecourse and Pengam. Several events are planned for smaller models, and unattached modellers, especially juniors, are invited to contact the secretary at 72 Ordell Street, Splott.

Scotland

GLASGOW M.A.C. are happy to report that their recruiting programme was a success, and club membership is rising steadily. A slide show was held recently for the benefit of the new members, and went down well with everyone concerned. The junior section of the club is engaged on building the A.P.S. Golden Wings design for the club glider contest.

Ireland

Highlight of the month for **BELFAST M.F.C.** has been an A and ½A T/Race with the same M.F.C. at their flying ground. Both sides showed lack of contest experience. Peter Valentine won the ½A with some consistent pit-stops and Maurice Doyle won the A with the tailplane "flapping in the breeze." Big trend at the moment is for big glo-motors: ETA 29s and Fox 35s being all the rage.

Pen Pals

Are wanted by Tom Cook, 3042 Queen Avenue, N, Mpls, 12 Minn, U.S.A., with interest in trading W.W. I books for cash or American merchandise.

For Hungarian modeller Gasko Karoly, Budapest XVIII, Pestlorinc, Esze Tamas-u 35, Hungary—interest in A/C and cars; and for A. J. Holdaway, 3 Currawa Street, Caulfield, Melbourne, Victoria, Australia, soon coming to this country, keen on contest power and a *Y-Bar* enthusiast.

For C. Buisson, La Charpine, St. Denis les Bourg, Ain, France. For Stan Robinson, Jr., 319 Conrad Street, Sarnia, Ontario, Canada, with C/L interests; and for K. Bates, of 29 Wilson Avenue, Irvine, Ayrshire, Scotland, who wants a German correspondent. Two juniors, R. Dailey, 114 Allenby Drive, Leeds 11, and P. J. Radford, 7 Heathfield, Swansea, Glamorgan, Wales, want free-flight pen pals.

See *you* at the NATS !

THE CLUBMAN.

New Clubs

PORT TALBOT M.A.C.
P. T. Waters, 18 Bridge Street, Kenfig Hill, Glamorgan.

WOKING AND D.M.A.C.
A. B. Pollock, 7 Mayford School Cotts, Mayford Green, Nr. Woking, Surrey.

HARROGATE M.F.C.
R. Dransfield, 34 St. Clement's Road, Harrogate.

SUTTON COLDFIELD R.C.M.A.C.
D. Sanderson, 175 Johnson Road, Erdington.

Secretarial Changes

BATH M.A.C.
T. G. Phelps, 113 Coronation Avenue, Oldfield Park, Bath, Somerset.

BOURNEMOUTH M.A.C.
J. D. Hayward, 4 Wynford Road, Moordown, Bournemouth.

BODMIN MODEL MAKERS.
C. M. P. Wilson, 4 Chapel Lane, Bodmin, Cornwall.

BRISTOL AND WEST M.A.C.
R. E. Wade, "Barlinka", Lampton Road, Long Ashton, Nr. Bristol.

CHELTENHAM M.A.C.
P. S. Lane, 131 Bath Road, Cheltenham.

CHESTERFIELD SKYLINERS M.A.C.
B. Fearn, "Wingholme ', 10 Gloucester Road, Stonegravels, Chesterfield.

IPSWICH M.A.C.
J. Glazin, Castle Acre, Capel St. Mary, Ipswich, Suffolk.

LAINDON M.A.C.
S. J. Quinn, "Lynmead", Sandringham Road, Laindon, Basildon, Essex.

MAIDENHEAD AND D.S.A.
F. W. C. Sivier, Littlewick Place, Littlewick Green, Nr. Maidenhead.

MANCUNIANS M.A.C.
W. Bell, 17 Radclyffe Street, Middleton, Manchester.

For Your Diary

June 7th
Dartford C/L Rally, Combat, A, ½A, B, T/R, at Central Park.

June 14th
C/L Rally, Combat 2·5-3·5, T/R, F.A.I. and B, Laindon High Road School Field. Godalming T/R, Combat, Stunt Rally, Meadrow Rec., Godalming.

June 21st
Northern Heights Gala, all classes (Queen's Cup for Wakefields) except T/R, Stunt, at R.A.F. Halton.
Clwyd Slope Soaring, Moel Ffamau, N. Wales, Open, A/2, Jr., and R/C events. S.M.A.E. insurance required. No fuse d/ts.

June 28th
Combat Rally, Ashford (Kent), Victoria Park, Ashford.

August 2nd
Surbiton Gala, Open Free Flight, at Chobham Common.

August 16th
Devon Rally, F/F Rubber, Glider, Power, R/C, Combat, at Woodbury Common, Near Exmouth.
Ramsgate Controline Rally, T/R, A and B, Stunt and Combat. Entries to M. Robinson, 21 Winterstoke Crescent, Ramsgate, Kent.

August 23rd
South Midland Gala, all classes at College of Aeronautics, Cranfield.

September 13th
Croydon Gala, F/F Rubber, Glider, Power; Chuck and Slope Glider, Chobham Common.

September 27th
Midland Area Rally, venue to be announced.

October 4th
South Coast Gala, venue to be announced.

S.M.A.E. Results

ASTRAL TROPHY (F.A.I. Power)

1. Manville, P. (Bournemouth)	15:00+4:10
2. Smith, T. W. (Eng. Electric) ...	14:49
3. Faulkner, B. (Cheadle)	13:12
4. Hinds, S. (Wallasey)	12:40
5. Manville, J. H. (Bournemouth) ...	12:10
6. Fuller, G. (St. Albans)	11:58

39 flew, 26 returned no score.

S.M.A.E. CUP (F.A.I. Glider)

1. Barr, A. (Coventry)	11:49
2. Turner, M. (Cheadle)	10:26
3. Picken, B. (Wigan)...	9:54
4. Wiggins, E. E. (Leamington) ...	9:44
5. Hinds, S. (Wallasey)	9:27
6. Spencer, D. (Chester)	9:19

62 flew, 35 returned no score.

WOMEN'S CUP

1. Mrs. O. L. Fuller (St. Albans) ...	3:45
2. Mrs. E. M. Piltness (Chester) ...	0:57

JETEX TROPHY

1. O'Donnell, J. (Whitefield)	20:88 ratio
2. Presnell, M. S. (Thameside) ...	12:58
3. Roberts, R. (Bolton)	9:61

Only 5 entries.

S.M.A.E. Contests

BRITISH NATIONALS

May 17th/18th

Thurston Cup (U/R Glider) Gold Trophy (C/L Aerobatics) Knokke Trophy (C/L Scale) S.M.A.E. Trophy (Radio/C) Davies "A" Cup (F.A.I. t/r) Speed (Classes 2 and 3) ... Combat (Prelim. Heats) ... Short Cup (Pay Load) ...	Sunday, 17th R.A.F. Scampton
Sir John Shelley (U/R Power) Model Aircraft Trophy (U/R Rubber) Super Scale Trophy (F/F Scale) Ripmax Trophy (Radio/C) Davies "B" (Class B T/Race) Speed (International Class) Combat (Finals)	Monday, 18th R.A.F. Scampton

May 30th-31st-June 13th-14th
World Championship Team Selection Trials. *Centralised*

TIME HAS PROVED! the AM25

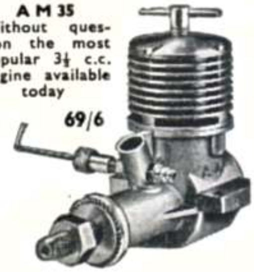
The A.M.25 was the first in the A.M. range and is now a firmly established favourite with all classes of modellers. It is a first class, general-purpose engine designed for long life with high output. Suitable for all types of flying, including Control-line Stunt, Combat and Team-racing; Free flight duration and Radio-control.

66/5

A M 15
The ideal motor for all ½A contests where the utmost output is required from 1.5c.c.
57/10

A M 10
The AM10 is now firmly established as the world's best 1 c.c. diesel.
56/8

A M 35
Without question the most popular 3½ c.c. engine available today
69/6



Distributed by H. J. NICHOLLS (WHOLESALE) LTD., 308 Holloway Road, London, N.7.

D. J. ALLEN ENGINEERING LTD.

MANUFACTURERS OF ALLEN-MERCURY DIESEL ENGINES

28 ANGEL FACTORY COLONY, ANGEL ROAD, EDMONTON, N.18 *Phone:* EDMONTON 6466

EXPORT ENQUIRIES: COURTNEY REED (EXPORT) LTD., 4 BRABANT COURT, PHILPOT LANE, E.C.3

PARAGUAY · ARGENTINE · PORTUGAL · YUGOSLAVIA · SOUTH AFRICA ·

· HOLLAND ·

· SWITZERLAND ·

SUPPLIES THE WORLD!

Equado

BALSAWOOD

More and more satisfied clients the world over receive their regular shipments of *Equado*—such is the popularity of this fine balsawood used by modellers everywhere. Equado balsawood is supplied in metric and English sizes.

TRADE PRICE LISTS ON APPLICATION TO SOLE MANUFACTURERS AND SHIPPERS.

THE CONTINENT · INDIA · AUSTRALIA · NEW ZEALAND · ITALY · FINLAND · MALTA · BELGIUM ·

E. LAW & SON (TIMBER) LTD. 272-274 HIGH STREET · SUTTON · SURREY · VIGilant 8291-2

"P&P" means PLASTIC and PLY!

The ideal combination for the beginner

The Javis "CHALLENGER" 20" Launch Kit
WITH VACUUM-FORMED PLASTIC HULL

Price 18/6

- ★ Marine Ply Deck and Bulkheads
- ★ Prefabricated to the last detail
- ★ Plan and very complete instructions
- ★ Prop, shaft and stern tube
- ★ Rudder Assembly
- ★ Rubber Grommets for sealing
- ★ For Electric Motor
- ★ In deep rigid box with three-colour display label

Made-up Model Service to Retailers

Kits available from all Model Shops

JAVIS MANUFACTURING CO., 42/44 LOWER HILLGATE, STOCKPORT, CHESHIRE
Telephone: **Stockport 6866**

THE MODEL SHOP
MANCHESTER

for

COMPREHENSIVE SELECTION OF THE BEST BRITISH AND IMPORTED ENGINES, KITS AND ACCESSORIES, COMBINED WITH RETURN OF POST MAIL ORDER SERVICE

ENYA 15 GLOW	£4/4/–	O.S. MAX 35 GLOW ...	£6/14/–
ENYA 15D ...	£6/14/–	O.S. MAX 29 GLOW ...	£6/12/9
ENYA 29 GLOW	£6/10/–	O.S. MAX 15 GLOW ...	£5/12/9
ENYA 60 GLOW	£10/15/6	ETA 29 SERIES VI	£7/6/4
GLO CHIEF 35	£6/12/6	COX PEE WEE .3 c.c. ...	£2/11/3
MERCO 29 ...	£5/19/6	COX BABE BEE	£2/11/3
MERCO 35 ...	£5/19/6	COX THERMAL HOPPER ...	£4/5/4
FROG 3.49 BB ...	£3/19/2	EIFFLAENDER 1.49 ...	£4/6/–

SPARE HEADS FOR COX PEE WEE 8/6, & BABE BEE 9/6

AMERICAN STUNT KITS!!

TOPFLITE NOBLER ...	£5/16/–	VECO THUNDERBIRD	£5/16/–
TOPFLITE FLITESTREAK	£2/11/3	VECO SMOOTHIE ...	£5/3/2
STERLING RINGMASTER ...	£2/5/4	STERLING SUPER RINGMASTER ...	£3/4/–

THIMBLEDROME CONTROL LINE HANDLES £1/18/4
NEW! MERCURY LIGHTNING P38 STANDARD KIT 57/6, DE-LUXE 73/8

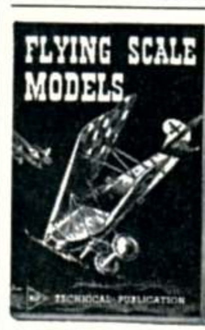
MONOGRAM PLASTICS!!

AVENGER and ALBATROSS 17/6 each. THUNDERCHIEF, HUSTLER, B66, LITTLEJOHN and REGULUS II MISSILES 11/6 each. MISSILE ARSENAL 34/–

13 BOOTLE STREET - MANCHESTER 2
Tel: BLACKFRIARS 3972

Read *Popular Flying*, the monthly magazine of the Popular Flying Association, the representative body of ultra light and group aviation. Subscription £1 a year. Specimen copy 1s. 6d. from the

POPULAR FLYING ASSOCIATION
Londonderry House, 19 Park Lane, London, W.1



FLYING SCALE MODELS

First time subject ever covered fully. Ron Moulton Asst. Editor of AEROMODELLER, has written what will be a "standard work". Every aspect of flying scale model aircraft comprehensively covered, with details of suitable model types, every method of propulsion, including working model jet and ducted fan models, diesel and rubber powered. Automatic controls for super-stability, multi-engines designs, rare "gen" for complete scale accuracy, camouflage tables, control line types and methods of operation. Bound in linson board two-colour dust cover, 128 pages on gloss paper, size 8½ x 5½ in., 90 line drawings, 127 photo pictures.
Price **10/-**

MODEL AERONAUTICAL PRESS LTD., 38 CLARENDON ROAD, WATFORD, HERTS

A.V. REBORING SERVICE

Auto Vaporisers, New Road, Lymm, Cheshire

Rebores: E.D. Bees and Elfins 14/-, **others** 16/-. Under .46 c.c. 20/-. C.W.O. or C.O.D. 2/- extra. **Spares** stocked, plus Fuel Filters and Carbs. **Enquiries S.A.E. please.** Prompt service and sixty-day guarantee. Send for price list for other services. (*Trade enquiries invited*)

THIS IS THE START OF YOUR SEASON

FIND OUT WHAT THE AMERICANS HAVE ALREADY FOUND OUT .... THAT THE ETA 29 Mk.6 STOCK MOTOR IS THE BEST THAT MONEY CAN BUY. OUR SALES TO AMERICA HAVE INCREASED BY 800%

ETA 29 Mk.6

★

WATCH THIS ENGINE LEAD THE WAY THIS YEAR

★ *PRICES ARE NOW DOWN!* ★

ETA 29 Mk.6 £5/19/6 P.T. 22/5

ETA 19 Mk.2 £5/14/- P.T. 21/5

See how our engines are applied to other sports. Visit the cable car-racing at Slip End, near Luton, on 24th May, 28th June, 23rd August, 20th September.

Racing from 2 p.m. sharp.

Manufactured by

E.T.A. INSTRUMENTS LTD.

289 High Street, WATFORD, Herts.

YEOMAN PILOT

YEOMAN KITS are the fashion leaders—top in quality, performance and modern design. Now FREE vouchers in every kit to qualify you for your YEOMAN Pilot's Wings. Ask your local model shop for details.

YEOMAN QUICKBUILD KITS
Fully prefabricated pre-decorated parts, colour printed. Interlocking assembly, foolproof plan and instructions.

YEOMAN KITS
build models which really fly! Real **quality** kits of **modern** design.

YEOMAN KITS
contain FREE vouchers, too. Just 5 vouchers qualify for your YEOMAN Pilot's Wings.

OTHER KITS
include the 'Sprite', 'Mite' and 'Minx' model boats — all top-class designs.

YEOMAN
products also include a vast range of accessories, etc. —everything you need for modelling.

NEW KITS
are on the way! Available shortly will be George Fuller's DIXIELANDER—

MONOPLANES . . . 5/10

Fully pre-fab, pre-decorated parts:

AUSTER AUTOCAR
D.H. PUSS MOTH
AERONCA SEDAN
PIPER PACER
CESSNA BIRD-DOG

16"-19" *span.*

BIPLANES 6/9

employing new design ideas for true scale appearance and simple building.

HAWKER FURY
GLOSTER GLADIATOR
D.H. TIGER MOTH

all 15" span.

GLIDERS

RAMBLER
33" *span* **5/4**
High-performance towline glider, designed by John Chinn.
14" TIGER 1/11
16" PANTHER 1/11
(*all balsa, predecorated*)

Rambler is a tissue covered model.

ACCESSORIES

Stunt Tanks **3/2-4/2**
T/R Tanks **2/11-3/5**
Fuel tubing **4d.-6d.** per ft.

Balsa, hardwood, cements, dopes, tissue, wire, etc.,etc.

INSIGNIA

Scale, flying scale, roundels, etc., etc. Alphabets, numerals, colour strips and chequers. Ask for YEOMAN transfers to ensure buying the best.

YEOMAN

A.A. HALES Ltd
26 STATION CLOSE
POTTERS BAR
Tel.: POTTERS BAR 2226/7

THE NEW QUALITY ENGINE

RIVERS QUALITY ENGINES

SILVER STREAK

2·49 c.c.
Bore: .5782"
Stroke: .5782"
·28-·30 B.H.P.

price **£6.5.8** (incl. P.T.)

THE DIESEL THAT SETS NEW STANDARDS

Send for FREE brochure

S-M-O-O-T-H POWER

See it in action at all the important contests—and look out for the new **3.5 c.c.** model. The *best* is always RIVERS

A.E.RIVERS (SALES) LTD. 15 MASWELL PARK ROAD, HOUNSLOW MIDDLESEX, ENGLAND — TELEPHONE HOUNSLOW 5116

SLOPE SOARING

with a radio control model sailplane is a fascinating pastime, but so is slope soaring in a glider at Camphill.

A week's summer gliding course costs fourteen guineas and is a holiday you will never forget. Details from Secretary, Derbyshire and Lancashire Gliding Club, CAMPHILL, GREAT HUCKLOW, DERBYSHIRE

WANT TO LEARN TO FLY?

For as little as £14 you can enjoy a

GLIDING HOLIDAY

at Britain's Finest Soaring Site.
Send for illustrated brochure to: "Enquiries"

MIDLAND GLIDING CLUB LTD.,
Long Mynd, Church Stretton, Shropshire

LONDON GLIDING CLUB hold gliding courses at their beautiful hill site from April 30 to October 30. Price £14 to £16 10s. 0d. according to period. Full board accommodation and instruction inclusive. Write for brochure to:—

The Manager, Dept. A.M.1, London Gliding Club, Dunstable Downs, Dunstable, Beds. (Dunstable 419)

CORNISH RIVIERA GLIDING COURSES
PERRANPORTH

April/October, magnificent cliff soaring site with guarantees and hotel accommodation by best surfing beach.

Apply:

J. W. E. Berry, Parc Sparbles, Carbis Bay, St. Ives (516) Cornwall

BUD MORGAN
THE MODEL AIRCRAFT SPECIALISTS

★ NEW BUDGET PRICES—APPROX. 2½% OFF ★
BIG REDUCTION IN AURORA PRICES.
SEND FOR LATEST PRICE-LIST

SECOND-HAND ENGINES
E.D. Bee, S. Merlin, Frog 80, all at **35/-** each. E.D. Hornet, Sabre, Spitfire at **37/6** each. A.M.25, Manxman 3.5, Frog 500, all at **42/6**. E.D. Racer **45/-**. Send for S/H price list.

I PAY CASH FOR GOOD SECOND-HAND ENGINES

CONTROL LINE KITS

New K.K. Spectre	38/5
Picador 1-1.5 Stunt	19/6
Marvin 1-1.5 Stunt	19/6
New K.K. Talon	25/6
K.K. Champ. 1 c.c.	12/9
Ranger Class A	12/9
Mercury Lightning	58/9
De Luxe Lightning	75/6
Aerobat 2.5 Stunt	27/6
New K.K. Demon	30/-

ENGINES

NEW Frog 100 Mk. II ...	55/-
NEW Frog 150 Type R ...	55/-
FOX 15	70/6
FOX 29	120/-
A.M.15	59/6
A.M.25	68/6
A.M.35	71/8

COX Pee Wee	51/3
TAPLIN Twin 7 c.c.	£8/12/-
FROG 3.49 Ball Race ...	91/-
SILVER STREAK 2.49	£6/10/-
E.D. Bee 1 c.c.	54/9
E.D. Hornet 1.46	55/11
E.D. Racer 2.46	79/-
E.D. Fury 1.46	77/9
Mills .75	58/9
Allbon Super Merlin ...	52/7
Merlin .76	43/10
Frog 80 D	47/6

FREE FLIGHT POWER

K.K. Skylon 1 c.c.	12/9
New K.K. Halo	21/-
Veron Deltaceptor	37/6
K.K. Junior 60 2.5 c.c. ...	54/-
Veron Deacon 52-in. ...	34/6
Calypso Cub .75 c.c. ...	13/6
Cardinal .75 c.c.	18/7

JETEX—BIG PRICE REDUCTION

Jetex 50 Outfit	7/6
Jetex 50C with Augmenter Tube	10/-
P.A.A. Loader	19/5
Jetex 50 Fuel (20)	1/11
Jetex now only per flight	1d.

22 CASTLE ARCADE CARDIFF

Phone: 29065

LEIGH MODEL CENTRE

for personal service

ENGINES

The NEW RIVERS SILVER STREAK 2.5	£6/10/-
ENYA 15 GLO ...	£4/4/6
ENYA 15D	£6/5/6
ENYA 19 GLO ...	£4/4/6
ENYA 60 GLO ...	£10/4/6
O.S. MAX 35 ...	£6/5/6
O.S. R/C 35	£8/10/6

VECO 29	£8/15/-
VECO 35	£8/15/-
P.A.W. 149 ...	£4/8/6
FOX 29	£8/15/-
FOX 59	£15/15/-
COX PEE WEE ...	51/3
COX GOLDEN BEE	64/4

AMERICAN KITS

RINGMASTER	45/4
Super Ringmaster ...	64/6
Flying Fool	51/3

C/L HANDLES

BERKLEY C/L HANDLE	12/6
HANDYREEL	38/4
NEW F.A.I. HANDLE	6/6

All Mercury, Keil, Airfix, etc., Kits, Engines, etc., in stock. Post your Order without delay and we will do the same.

We are the only firm specialising in Repairs Service and Tuning for American, Japanese and most foreign Motors. Send your Motor along for an IMMEDIATE quote. C.O.D. Service available We are prepared to undertake Tuning and specialised Machining in our Workshops. S.A.E. with your query for immediate reply.

Have you tried our exclusive Royce Accessories? 1¼" T/R SPINNERS IN DURAL SCREWS ON TO CRANKSHAFT, STATE MOTOR, 10/6

Veco and Enya type Carburettor assemblies **7/6** each. Double Bobbins in Dural for the 50 gramme Wakefields. Why not let us convert your GOLDEN BEE THERMAL HOPPER, etc. Burnt out heads re-machined to take a standard ENGLISH GLO PLUG **5/6**. **NEW, NEW,** THE ROYCE 1.49 TWIN BALL RACE REED INDUCTION **£4/15/-**. R/C CLUNK TANKS. BOTH READY SOON. R/C CONVERSIONS from **15/-**. EXHAUST OR TWO-SPEED CARB. **Overseas Customers order with confidence C.W.O. or C.O.D.**

MAIL ORDER BY RETURN — **49 hours ENGINE REPAIR SERVICE**

97 RAILWAY ROAD • LEIGH • LANCASHIRE

AUSTRALIA Tel.: Melbourne Cent. 918

CENTRAL AIRCRAFT CO., PTY.
5 PRINCES WALK, MELBOURNE, C.I
Australia's Main Distributor for: "Aeromodeller", "Model Maker" and their Plans Service.

BIRMINGHAM Tel: EAS 0872

THE PERRYS
769 ALUM ROCK ROAD, WARD END
Agents for all leading kits, engines, radio control model car racing. Advice without obligation by return postal service.

BLACKBURN

RAWCLIFFE'S
FOR MODELS
38 WHALLEY RANGE BLACKBURN
MODEL BOAT KITS
AIRCRAFT KITS
ENGINES & ACCESSORIES

BOLTON Tel.: 7097

ROLAND SCOTT
The Model Specialist
147 DERBY STREET
The obvious shop for all Model Aircraft Requirements

CANTERBURY

MEERS (Engineering) LTD.
THE MODEL SHOP,
20 SUN STREET
CANTERBURY
(Under the Shadow of the Cathedral)
The largest stock of Aeromodelling Equipment in East Kent. Your visit welcomed. By-return Postal Service.

DARLINGTON Tel.: 66399

HANDCRAFTS
31 BONDGATE, DARLINGTON
COUNTY DURHAM
Boats, Model Railways, Aircraft
Everything for the Model Maker
also at **54 Gorgie Rd., Edinburgh**

DONCASTER Tel.: 2524

B. CUTTRISS & SONS
MODELS AND HANDICRAFTS
49-51 CLEVELAND STREET
Call and see our Shop

GLASGOW Central 5630

CALEDONIA MODEL CO.
Model and Precision Engineers
5 PITT STREET, C.2
Our works at your service for engine repairs, rebores and rebuilds
Everything for beginner and enthusiast

GRIMSBY Tel.: 3220

THE MODEL SHOP
49 NEWMARKET STREET
Plastic, flying model kits and accessories
Send S.A.E. for price list
RADIO REPAIRS — PROMPT SERVICE

HARROW Tel: Har 5958

WEALDSTONE MODEL SHOP
39 THE BRIDGE,
WEALDSTONE, MIDDLESEX
FULL RANGE OF AIRCRAFT KITS, FLYING SOLID AND PLASTIC. BOATS, CARS, BALSA, DIESELS, etc.

HONG KONG Tel.: 62507

RADAR CO. LTD.
2 OBSERVATORY ROAD
TSIN SHA TSUI, KOWLOON
The most complete stock of aeromodelling and hobby supplies in the Far East. Run by an experienced modeller. Agents for Solarbo, Britfix and Sole Agents for O.S. engines and radio control equipment

LEEDS Tel.: 27891

THE MODEL SHOP
58 MERRION STREET
(Nr. Tower Cinema)
Model Aircraft — boats — cars — railways, all makes engines. Every accessory, R/C equipment, same day postal service.

LEIGH

LEIGH MODEL CENTRE
97 RAILWAY RD., LEIGH, LANCS
We will supply anything from stock. Specialists in engine repairs. R/C conversions.
Mail order by return anywhere in the world

LINCOLN Tel.: 588

THE MODELMAKERS MECCA
13 CLASKETGATE
(Next Door to Theatre Royal)
Large stocks of all Plastic Kits, Engines, Fuels and accessories. Stockists of Triang, Trix, Rivarossi Railways.

LONDON Tel.: PAD 8827-8-9

BURLEIGH'S
303 EDGWARE ROAD, W.2
THE MODEL MAKERS' PARADISE
BURLEIGH of Edgware Road, Ltd.

LONDON Tel.: HOP 3482

MODEL AIRCRAFT SUPPLIES LTD.
171 NEW KENT ROAD, S.E.1
The oldest established aircraft shop in London. Service with satisfaction

LONDON Tel.: NORth 4272

HENRY J. NICHOLLS LTD.
308 HOLLOWAY ROAD, N.7
We stock only the best for AEROMODELLERS

LONDON Tel.: VAN 7062

J. G. S. CLARKE
46 BROOKWOOD ROAD,
SOUTHFIELDS S.W.19
MODEL ENGINEER AND STOCKISTS OF KEIL KRAFT, VERON, FROG, ETC.

LONDON Tel.: Isleworth 8978

BARDSLEY'S
263 HIGH STREET,
BRENTFORD, MIDDLESEX
Service and Satisfaction our Speciality. Own Workshops available for Engine Testing and Tuning. Stockists of V.I.P. Roadways.

MANCHESTER Tel.: BLA 6159

MODEL SUPPLY STORES
17 BRAZENNOSE STREET, MANCHESTER 2
Manchester's Main "Mecca" for every make of KIT, ENGINE & ACCESSORIES, Solarbo, BALSA, etc.
Northern SKYLEADA Factory

CLASSIFIED ADVERTISEMENTS

PRESS DATE for issue July, 1958, May 20, 1958

ADVERTISEMENT RATES

Private	**Minimum 18 words 6s. and 4d. per word for each subsequent word.**
Trade	**Minimum 18 words 12s., and 8d. per word for each subsequent word.**

Box numbers are permissible, to count as 6 words when costing the advertisement.

COPY and Box No. replies should be sent to the Classified Advertisement Department, The "Aeromodeller", 38 Clarendon Road, Watford, Herts.

FOR SALE

60-in. span A.P.S. R6-B; almost new E.D. Fury 1·5 c.c.; Hill 2-valve Rx Mactuator, etc., all installed. Flys superbly. Full range accessories. Multi-purpose meter, etc., etc. AEROMODELLERS, Radio books. £10. B. Eden, 91 Carmill Road, Billinge, Wigan, Lancs.

Frog 2·49 modified, 50s.; E.D. Bee, 25s.; Pee Wee, 35s.; and Veco 19, 85s. Both little used. Greenway, Neston, Steyne Road, Bembridge, Isle of Wight.

Little used Enya 15D diesel. Excellent condition £5 10s. S.A.E. please. M. Taylor, Greentrees, Dry Street, Langdon Hill, Essex.

Hardly used E.D. Mark 4 Senior 3-reed outfit £12. A. Woodhouse, 27 Commercial Street, Barnsley, Yorks.

Unflown 50 in. American design Trixter Beam, Hill Rx motor actuator, rudder, elevator, 1.49 engine, offers over £10. Watts, 11 Newtown Road, Hove, Sussex.

Two Elfin 2.49 Radial. Two E.D. Hunters. All perfect condition, offers. Carr, 16 Pringle Road, Brinsworth, Rotherham, Yorkshire.

AEROMODELLERS, 1949/56 inclusive. 1952 bound. Feb., '50, Sept., '55 missing. *Flying Models*, Feb., '51 to Feb., '53 inclusive, less Feb., '52, 12 copies. AEROMODELLER Annuals, 1948/52 inclusive, offers. B. Moores, 1 Fairfax Road, Cowley, Oxford.

Frog 80, Frog 1.49, 10 c.c. Petrol, 30s. each. Elfin 2.49 35s. Eta 29 III 60s. Bee 1 c.c. 12s. 6d. Cadet Tool Kit 15s. P. Ogle, Dundrum, Newcastle, Co. Down, Northern Ireland.

E.D. Bee and Baby, new condition, bench run only £2 each. B. Tyers, 24 Park Grove, Barnsley.

McCoy 29 80s. Frog 50 27s. 6d. M.S. 3 in. airwheel 11s. o.n.o. Tuff, 58 Kingston Road, Ewell, Surrey.

New Allbon Dart, unused, propeller, AEROMODELLER Annuals, 1952-57, wheels, etc. £3 10s. o.n.o. Simmonds, Park View, Abbey Road, Malvern, Worcs.

Webra Boxer motor 7.5 c.c. opposed twin diesel, new with vacuum pump, two-speed throttle £20. Cable, 32 Beamish Drive, Bushey Heath, Herts.

Taplin Twin unflown £6. Fox 35 flown twice £4 10s. E.D. 3.46 Hunter in very good order £1 5s. o.n.o. Rogers, Basildon, Chorley Road, West Wycombe, Bucks.

Allbon Bambi with prop. not run in 42s. 6d. New u-reely handle, lines, swivels 35s. 3½ in. Drome airwheels, new type unused 10s. Daniels, 108 New Cheveley Road, Newmarket, Suffolk.

Six E.D. Standard relays. One E.D. 6-reed Unit "Transmutone" Multi-receiver. Mechanically sound £9 o.n.o. A. Brown, 29 Benham Close, Chesham, Bucks.

Frog 500 40s. Arden 19 3.2 c.c. glo/petrol 45s. 3 Cottage Corner, Ilton, Ilminster, Somerset.

Good McCoy 55 £5. 50 AEROMODELLERS and *Model Aircraft*, 1949-59 6d. each. Christie, 20 Charlotte Street, Leamington, Warwickshire.

Mills .75 30s. E.D. Bee in Aerokits Sea Hornet 60s., bargain. Colley, 21 Muswell Hill Road, London, N.10.

Good A.M.10 Allbon Sabre, Fox 15, E.D. Baby 30s. each. AM.25 40s. New Cox Baby Bee 35s. Tanner, 82 Osprey Avenue, Gillingham, Kent.

Racer 15s., Merlin 20s. AM.25 30s., good running order, only S.A.E. answered. Wilkins, Bonningtons, Lt. Hallingbury, Bishops Stortford, Herts.

AM.35, little run, air and water cooled heads 45s. Also Frog 80, hardly used 25s. Write: Cleghorn, 6 St. Peters Close, St. Albans.

K.6 £2. Wasp .049 perfect £2. Spitfire Mk. I £1. Cannell, School House, Fenstanton, Huntingdon.

Elfin 1.49 BB. plus three props. 50s., hardly run. S.A.E. please. Wain, Station Lodge, Littlemore Hospital, Littlemore, Oxford.

106 AEROMODELLERS, few covers missing £4. 49 *Model Aircraft* 37s., all different. Separate copies 9d. Banks, 17 Tennyson Road, Barry, Glam.

New E.D. Racer, yet to be run in, 50s. E.D. Bee 30s. Parsons, 44 Lochfield Road, Paisley.

What offers? McCoy 29 speed, in professionally made team racer, Elfin 1.49 40s. Old Mills .75, needs new contra-piston 15s. M. T. Keynes, 19 Valley View Road, Rochester, Kent.

Selling up, E.T.A. 29 Mk. 6 £6. AM.15 40s. Amco 3.5 BB. 50s. AM.25, AM. 3.5 30s. each. All perfect. Walker, 74 Newmans Lane, Loughton, Essex.

Latest Enya 35 R/C, precision rotary exhaust throttle, twin pipes, tick-over adjustment. New £9 15s. Pike, 2 Middlebeck Avenue, Mapperley Plains, Nottingham.

Brand new and duty paid, Fox 19 115s. Veco Thunderbird Kit 25s. Berkeley Mustang Kit 70s. Box No. 589.

Allbon Javelin 1.49 c.c. diesel in perfect condition 35s. R. Weatherill, 3 Dene Close, Hayes, Bromley, Kent. Hurstway 1956.

Beautifully made 60 in. R/C Frog 500 with throttle control. E.D. 3-reed RX, best offer or will separate. S.A.E. Details and photo. Box No. 590.

Webra Winner 45s. E.D. Racer 45s. Competition Special 40s. Frog 150 30s. E.D. Baby 30s. All as new, £9 the lot. W. H. Y. Pearson, 25 Stirling Road, Melton Mowbray, Leics.

Special Pirelli—made expressly for aeromodelling. Genuine top quality ¼ in. in 17-oz. hank direct from Italy. Remit I.M.O. value 22s. Edgardo Sadorin, Via A. Caretto 3, Milano 508, Italy.

A.P.S. Pedro 32 in. stunt/combat, nylon covered, tank, unflown 25s. Elfin 1.49, good condition, with propeller 35s. AEROMODELLER, 1957-1958. Offers. Devonald, Sunny Back, Broad Haven, Haverfordwest, Pembs.

More Classified Advertisements on next page

SITUATIONS WANTED

Swiss student 21 years, looking for job for 1-2 months (August-September). French lessons, shop assistance, etc., against board and lodging or enough to live. J. D. Nicoud, Epinettes 20. Lausanne.

EXCHANGE

O.K. Cub 0.49 spare plugs, battery, exchange for 1.5 diesel. Bebb, 45 Swiftsgreen Road, Luton, Beds. S.A.E. please.

Reworked Frog 249 BB for new or unused Cox Pee Wee. Bott, West View, Light Oaks Avenue, Milton, Stoke-on-Trent.

WANTED

E.D. 2.46 racer watercooled, flywheel and any accessories. Price and particulars. All replies answered. J. Green, 3 Watson Street, Carlisle.

Pee Wee crankshaft or damaged motor for salvage of same. Rishworth, Oak Bank, Farnhill, Kildwick, Keighley, Yorks.

Scale model aircraft, to highest standard of workmanship required. Non-flying and flying. Box No. 587.

Can you build a scale aircraft model to exhibition or museum standard? Are you a specialist in either fighters, bombers, biplanes, monoplanes, civil, military, historical or modern types? Please write about your skill and achievements. Box No. 588.

TRADE

Ealing.—D. H. Meyer, Model Shop, 225a Northfields Avenue, W.13 (near Northfields Underground Stn.). Keilkraft and Jetex. Open Saturdays.

Ex-Services Stop Watches (Wrist and Pocket), Split action stop watches, Time-of-Trip clocks, Wrist Chronometers and Watches, etc. All with 12 months' guarantee. From 52s. 6d. Send S.A.E. for list. United Technical Supplies Ltd., 3 Harrow Road, London, W.2.

New CK. 507 Subminiature valves, similar DL.66, used by many Northern Clubs 5s. 6d. post free. Modern Radio, 103 Derby Street, Bolton, Lancs.

GLASS FIBRE. AUTOPLAX Experimental kits 19s. 6d. (post free). All materials sold separately. Open Saturday mornings. Automobile Plastics Ltd. (A.M.) Autoplax House, 62-64 High Street, Barnet, Herts. Tel.: Barnet 9147.

500,000 Transfers, roundels, insignia, numerals, alphabets, etc. Send 2s. 3d. for extra large assortment. HALFAX, Richardson Street, Halifax.

Ex-Government Stop Watches 45s. Illustrated leaflet on request. Charles Frank, 67-73 Saltmarket, Glasgow, C.1.

BOOKS

France's magazine for Aeromodellers. Send for free specimen copy and subscription details to *Modele Magazine*, 12 Rue Richard Lenoir, Paris XIe, France.

Sailplane and Gliding—published every month. Send stamped addressed envelope for descriptive leaflet; or 2s. 10d. for current copy; or 17s. for a year's subscription to British Gliding Association, Dept. A.19, Park Lane, London, W.1.

American Magazines. Year's subscription *Model Airplane News* 35s. Full catalogue free. Willen Ltd. (Dept. I), 9 Drapers Gardens, London, E.C.2.

World's largest stock of old aviation books (over 15,000). Catalogue Free. Top prices paid for Jane's, any year, World War I and other aviation books. Stuart, Fairlight Hall, Hastings.

MODEL AVIA—the monthly magazine for model flying in Belgium. Send for free specimen copy and subscription details. *Model Avia*, 67 Avenue Victor Emmanuel III, Uccle, Belgium.

O.M.U. Radio Control Equipment for immediate delivery

Single channel 3-valve receiver using DL 66's and DL 620. 60 v. H.T., L.T. 1½ v., filament current 70 m/A. Anode current rises from 1 m/A to 8 m/A with signal. Vibration-proof relay with spark suppressed contacts. Weight 3 oz. Size 3" x 1" x 2¼. Simple, one-control tuning. No meter required. Guaranteed. Will work with any carrier transmitter. **£8 . 7 . 6**

Three types of high power, single channel, hand-held transmitters in stock: Carrier Type 215, not crystal controlled, but using extra stable circuit, **£6 . 2 . 6.** Carrier Type 205. Crystal controlled, for absolute reliability with complete mobility of operation, **£8 . 10 . 0.** Single Tone type 101, high power, crystal controlled, for O.M.U. tone receivers, or Aerotone, or any single tone receiver, **£11 . 18 . 0.**

Extra high power versions using 6 volt valves, with built-in vibrator supply unit and crystal control are available to order for single carrier or single tone.

Three-reed receivers **£15 . 17 . 6.** Eight-reed receivers **£21 . 0 . 0.**

Eight channel transmitter, crystal controlled, temperature stable tones. Joystick control on four channels. Telescopic aerial. Built-in 6 volt vibrator supply unit avoids expensive battery replacements and ensures constant voltage.

For extra reliability, O.M.U. Reed receivers use separate battery supply for relay operation. These subminiature ¼-oz. relays are available from stock for 6 v. or 15 v. operation. Price **18/6.** Three-reed units **£2 . 15 . 0.** Five-reed units **£3 . 5 . 0.** Eight-reed units **£3 . 17 . 6.**

For more details of the O.M.U. range and special lightweight Siemens relays, send S.A.E. to **Ed Johnson, The Drug Stores, Larkhill, Wilts.**

ENGLAND'S ONLY AERO BOOKSHOP

- MODEL
- TECHNICAL
- REFERENCE
- HISTORICAL

Open all day Saturday only. 30,000 magazines in stock. 5,000 Aero books. Send 3d. for 14-page list.

2a RIDGE AVENUE
WINCHMORE HILL
LONDON - - - N.21

BEAUMONT

SUPER GLOWPLUG ENGINES

ETA "29" Mk.6, 4.7 c.c.	£7/6/4	ENYA "35" R.C., 5.7 c.c.	£8/3/4
ETA "19" Mk.2 ,3.1 c.c.	£6/19/8	ENYA "15", 2.4 c.c.	£4/4/2
O.S. "35" R.C., 5.7 c.c.	£8/3/4	FOX "19", 3.1 c.c.	£8/15/–
O.S. "29" R.C., 4.7 c.c.	£8/3/4	FOX "15", 2.4 c.c.	£3/10/6
O.S. "29", 4.7 c.c.	£6/10/8	COX Golden Bee .049, 0.8 c.c.	£3/4/–
COX Peewee .020, .3 c.c.	£2/11/3		

EVERY DIESEL ENGINE also in Stock

Send S.A.E. for LISTS of over 280 PLASTIC KITS

JONES BROS. of CHISWICK

56 TURNHAM GREEN TERRACE, CHISWICK, W.4

Phone CHI 0858 (*1 min. from Turnham Green Station*) **Est. 1911**

GIG EIFFLAENDER REBORING SERVICE

FIELD BANK, CHESTER ROAD, MACCLESFIELD

REBORES: BEES Series I and PB ELFINS, 14/-, HALF c.c.s, 20/-. OTHERS 18/-, except those under .46 c.c., which are 22/-. Prices cash with order. Return postage free C.O.D. service 2/- extra. SPARES stocked and fitted. ENQUIRIES S.A.E. please for immediate attention. PROMPT SERVICE with 30 days' guarantee. We do not bore ringed motors.

CLOCKWORK TIMERS

Best by test, the TICK OFF Timers have proven to be the most accurate and dependable timers ever offered. Truly the world's finest.

£1/7/0 EACH
Post Free

FUEL SHUT-OFF **TICK OFF**

- ★ 0-25 seconds
- ★ Split Second Accuracy
- ★ Weight: ½ oz.
- ★ Positive Fuel Shut-off
- ★ Precision made—crash resistant
- ★ Not affected by heat or humidity
- ★ Fuel Line, Mtg. Screws included

DETHERMALIZER **D-T TICK OFF**

- ★ 0-6 Minutes
- ★ Extremely Accurate
- ★ Weight: ⅜ oz.
- ★ Built-in sure-fire release or pop-up Tails, Flaps, etc.
- ★ Dial selected Time
- ★ Simple to operate

RETURN AIRMAIL SERVICE

TATONE PRODUCTS

ORDER DIRECT
1275 Geneva Ave., San Francisco 24, Calif, U.S.A.

T. GARNER & SON LTD.

HAND AND MACHINE TOOL DIVISION

6-8 PRIMROSE HILL, BARNSLEY Tel: 2908

Model Engineering • Plastics • Railways

★ P A W ★

SPECIAL 2·49-D

POWERFUL :: :: STURDY :: :: LIGHT

DESIGNED BY GIG EIFFLAENDER

RETAIL PRICE - - - - **£6 6s. 0d.** including P/Tax

PAW 1·49

RETAIL PRICE - - - **£4 6s. 0d.** including P/Tax

Peter Chinn writes *"the most powerful 1·5 yet tested"*

ALL ENQUIRIES TO:

PROGRESS AERO WORKS, CHESTER ROAD, MACCLESFIELD, ENGLAND

Trade Enquiries Invited

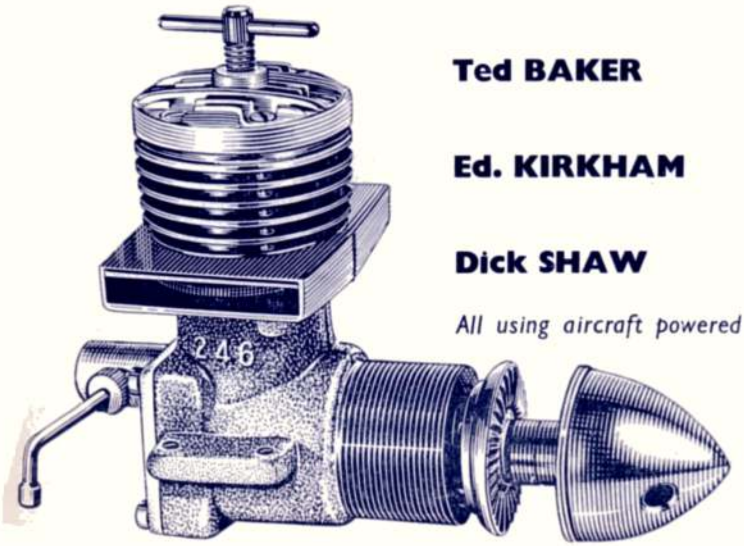
The ED TRADE MARK 2·46 c.c. "RACER" Does it again!

RADIO CONTROLLED MODELS CLUB OF NEW SOUTH WALES, AUSTRALIA

Annual Contest held October 12th,' 1958. Flying to M.A.A.A. Rules.
Official Results:

Bob BURGESS	**1st**
Ted BAKER	**2nd**
Ed. KIRKHAM	**3rd**
Dick SHAW	**4th**

All using aircraft powered by the **E.D. 2·46 c.c. RACER**



Since its introduction in 1951, the "RACER" has blazed a trail of glory in competitions all over the world. The "RACER" is the holder of many world records and although it is now eight years old, the above results prove that it is still one of the most prominent engines in its class. Suitable for use in model Aircraft, Boats or Cars, it is the engine to choose when exceptional speeds are vital to success.

PRICE **£3.5.0** *Plus 11/9 P. Tax*

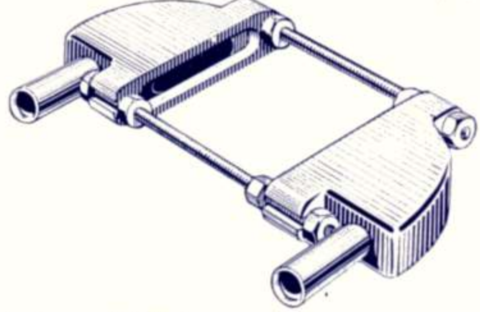
Watercooled Model **£4.0.0** *Plus 14/5 P. Tax*

EXHAUST MANIFOLDS

EASY TO FIX ON THE 2·46

Ultra Light Exhaust Manifolds, specially produced for the E.D. 2·46 c.c. "RACER" Engine. Designed for maximum efficiency, easy to fit, no filing required.

A length of plastic tubing should be attached to each of the two round exhaust tubes, brought out so as to divert the waste oil into the air below the aircraft instead of fouling the fuselage and wings. The same principle applies to model boats. The ends of the plastic tubing are brought into a suitable container, fitted into your model boat. Waste oil is thus collected, ready for disposal, instead of fouling the interior of the boat, or water.



Plastic Manifold Tubing available 1/- per foot.

PRICE **13/6** *5 P. Tax*

Order from your Model Shop

Write to Dept. A/M for illustrated lists giving full details of all E.D. Engines, Radio Controls, Mechanisms, Spare Parts, Accessories, etc.

E.D. ELECTRONIC DEVELOPMENTS (SURREY) LTD
DEVELOPMENT ENGINEERS
PHONE: MOLESEY 6037-6038 **ISLAND FARM RD. WEST MOLESEY, (SURREY) ENGLAND.** GRAMS: "EEDEE" EAST MOLESEY

Made and printed in Great Britain by the Croydon Times Ltd., 104 High Street, Croydon, for the Proprietors, The Model Aeronautical Press Ltd., 38 Clarendon Road, Watford, Herts. Published by the Argus Press Ltd., 8-10 Temple Avenue, London, E.C.4. to whom all trade enquiries should be addressed. Registered at the G.P.O. for transmission by Canadian Magazine Post.

KEILKRAFT
STAR CONTROLINERS!

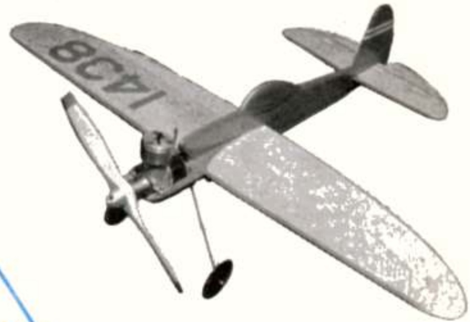
SPECTRE

The finest stunt model on the market. Combined wing flap and elevator control, plus correct aerodynamic design make the Spectre a dream to fly!

The exceptionally complete kit contains—

- Metal stunt tank
- 2 in. Sponge rubber wheels
- Plastic cowl
- Steel elevator & flap horns
- Paxolin bellcrank
- Full size plan & instructions
- Preformed U/C
- All balsa parts cut to shape
- Nuts bolts & washers
- Hingeing tape
- Wire & tubing for leadouts

41 in. wingspan **PRICE 37/4 INC. TAX** For 2·5 to 3·5 c.c. motors



CHAMP

Novices C/L trainer. All wood parts cut to shape, and all wire parts pre-formed. Build it in one evening!

PRICE 12/5 INC. TAX

For ·75 to 1·5 motors
20 in. wingspan

TALON

Extremely rugged and easy to build. A fully aerobatic combat wing design that you'll enjoy building and flying

32 in. span **PRICE 24/8 INC. TAX** for 2·5 to 5 c.c. motors

Talon kit contains:—

- Metal stunt tank
- Formed canopy
- All parts cut to shape
- Paxolin bellcrank
- Steel control horn
- Nuts, bolts & washers
- Wire & tubing for leadouts
- Hingeing tape
- Plan & instructions

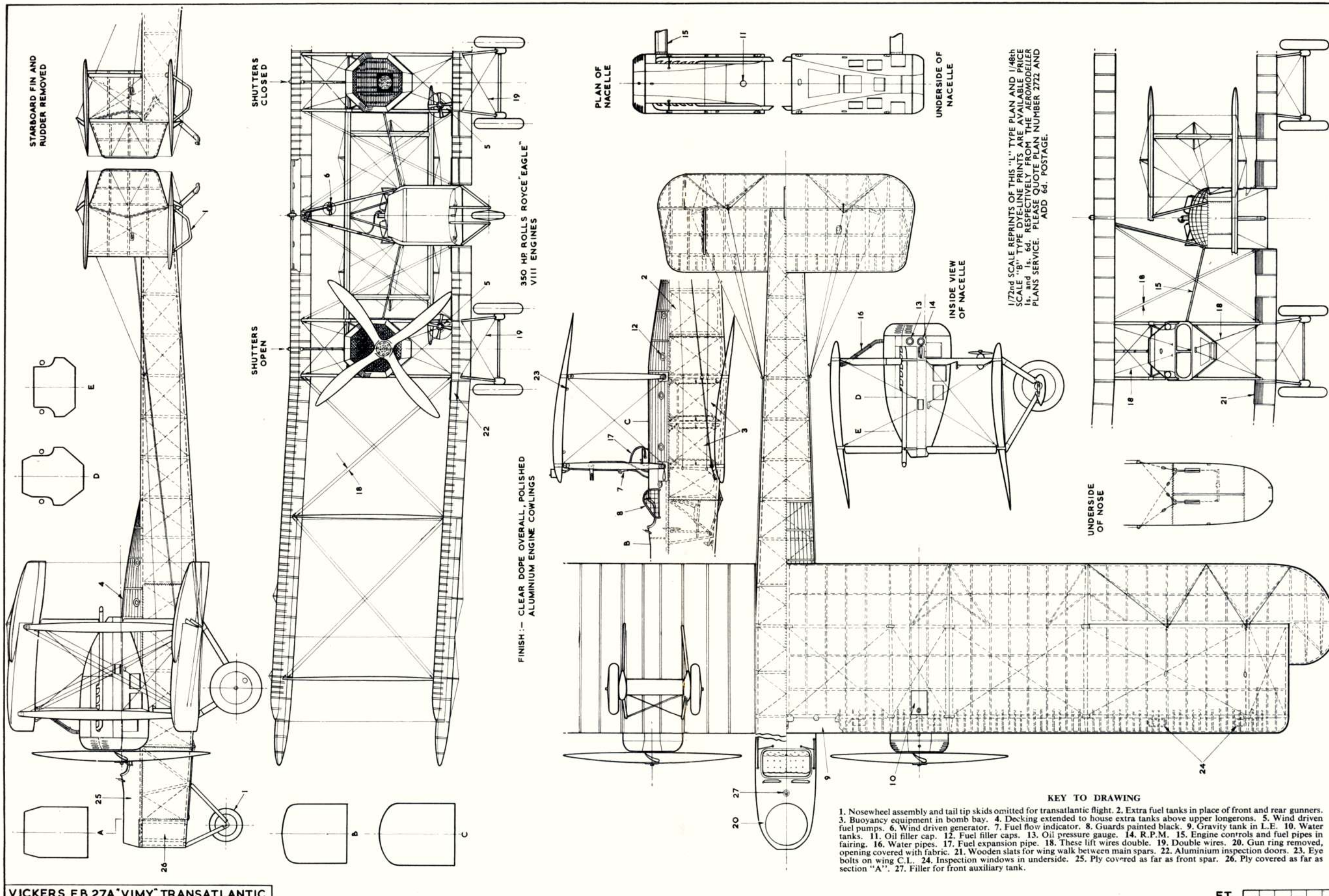
AND HE'S USING KEILKRAFT FUEL FOR SUPER PERFORMANCE!

KEILKRAFT

THE GREATEST NAME IN MODEL KITS

E. KEIL & CO. LTD., WICKFORD, ESSEX

WHOLESALE ONLY



KEY TO DRAWING

1. Nosewheel assembly and tail tip skids omitted for transatlantic flight. **2.** Extra fuel tanks in place of front and rear gunners. **3.** Buoyancy equipment in bomb bay. **4.** Decking extended to house extra tanks above upper longerons. **5.** Wind driven fuel pumps. **6.** Wind driven generator. **7.** Fuel flow indicator. **8.** Guards painted black. **9.** Gravity tank in L.E. **10.** Water tanks. **11.** Oil filler cap. **12.** Fuel filler caps. **13.** Oil pressure gauge. **14.** R.P.M. **15.** Engine controls and fuel pipes in fairing. **16.** Water pipes. **17.** Fuel expansion pipe. **18.** These lift wires double. **19.** Double wires. **20.** Gun ring removed, opening covered with fabric. **21.** Wooden slats for wing walk between main spars. **22.** Aluminium inspection doors. **23.** Eye bolts on wing C.L. **24.** Inspection windows in underside. **25.** Ply covered as far as front spar. **26.** Ply covered as far as section "A". **27.** Filler for front auxiliary tank.