MODEL AIRCRAFT

IN THIS ISSUE

AUGUST 1952

● M.A. BEGINNER'S COURSE PART I ● PICTURES AND REPORT ON THE TRIALS ● WEST ESSEX GALA ● THREE PLANS ● BUTLIN'S CONTESTS ● THE FROG 50 ON TEST ● PROTOTYPES WORTH MODELLING

1'6

Digital Edition Magazines.

This issue magazine after the initial original scanning, has been digitally processing for better results and lower capacity Pdf file from me.

The plans and the articles that exist within, you can find published at full dimensions to build a model at the following websites.

All Plans and Articles can be found here:

Hlsat Blog Free Plans and Articles.

http://www.rcgroups.com/forums/member.php?u=107085

Digital Edition Magazines.

AeroFred Gallery Free Plans.

http://aerofred.com/index.php

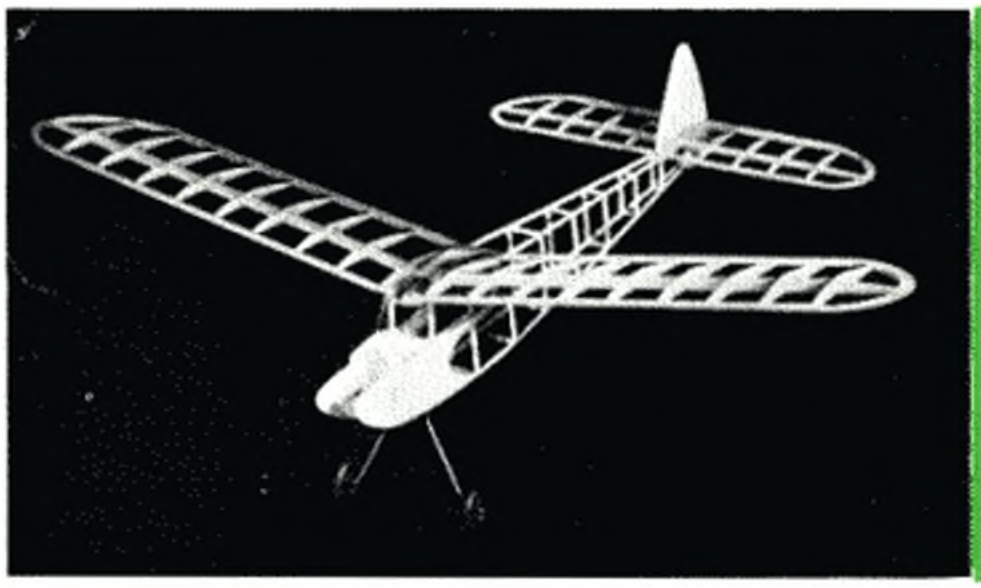
Hip Pocket Aeronautics Gallery
Free Plans.

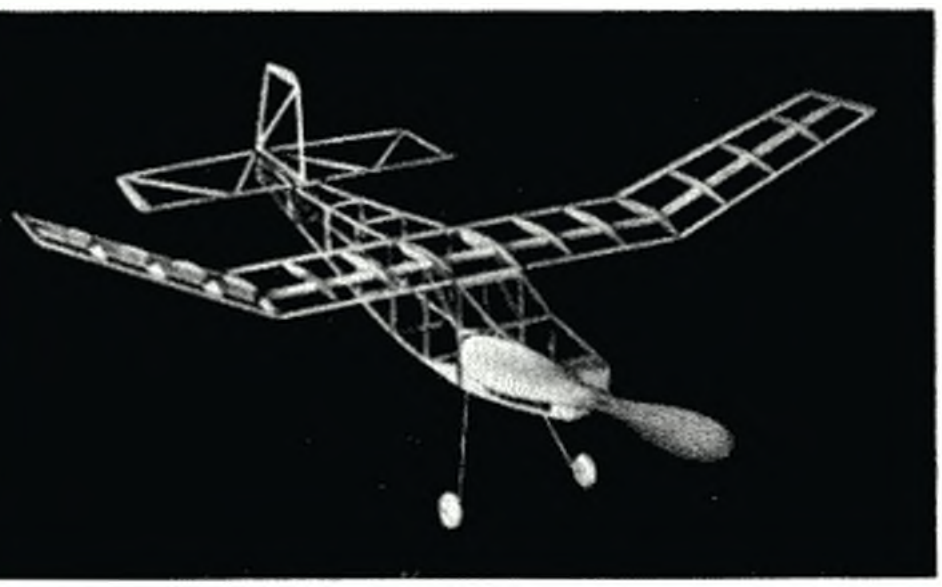
http://www.hippocketaeronautics.com/hpa_plans/index.php

Diligence Work by Hlsat.

SKYLEADA

INTRODUCES





2 NEW MODEL KITS

POINT FIVE

31 in. Span, High Performance Semi-Scale Free Flight Power Model

A beauty to watch in flight—just like the real thing.

Designed for all Point Five Engines, E.D. Baby, Elfin ·5, Allbon Dart, Frog 50.

The construction is very simple which makes this the ideal model for the beginner.

Kit contains all the materials required to build the finished model.

PRICE 9s. 6d. INCLUDING P.T.

For inexpensive aeromodelling insist on Skyleada Quality Kits and save money.

FLEDGLING

26 In. Span Rubber Driven Duration Model

If you are a Beginner this is the kit to start on—anybody can build it without previous experience.

If you are an experienced aeromodeller but want an easy-to-build model which will give you a good performance and stand up to plenty of knocks this is the kit.

Special features:

Complete kit contains all materials required to build the finished model, including cement, rubber and a Skyleada fully shaped balsa propeller.

Step by step instruction leaflet included with plan

Exceptional performance. Sturdy construction.

PRICE 5s. 3d. INCLUDING P.T.

Manfd. by **BRITISH MODEL AIRCRAFT MFG. CO. LTD.**

180, LONDON ROAD, MITCHAM, SURREY

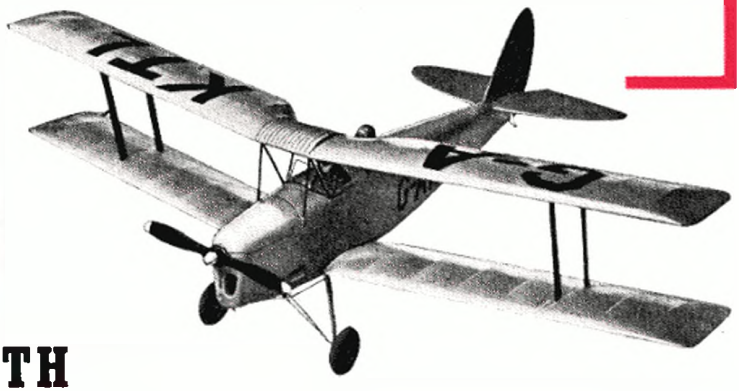
THE MODEL OF THE YEAR

it's the

MERCURY

D.H.

TIGER MOTH



Aeronca — Monocoupe — Skyjeep — Stinson 105—these are names that, thanks to Mercury, have a permanent place in the realms of quality scale-modelling. Now comes what many regard as the greatest of them all—the world-famous De Havilland "Tiger Moth." Mercury's true-scale, accurately detailed version, is without doubt, the model of the year and modellers everywhere are bent on being first in the air with it. This 33 in. span biplane is for 0.46 to 0.75 c.c. diesels with which it gives scale performance as well. This Mercury kit is superb, and contains finest graded Solarbo, printed and pre-shaped, tissue, wire, full-size plans and step-by-step instructions for building and flying. (No cement or airwheels.) Price inc. P. Tax **34/7**

A Superb range of Gliders

There is a MERCURY Glider for everyone from beginner to Nordic competitor. Their design and quality are such that they are enabling more and more modellers to reach contest standards. Mercury gliders spell economical modelling plus longer flying life.

GREBE

GNOME

MARTIN

MAGPIE

NORSEMAN

MARAUDER

MAGPIE.
24" beginners ... 4/11
GNOME.
32" elementary ... 7/4
MARTIN.
40" junior contest 9/2
GREBE.
49" intermediate contest 15/-
NORSEMAN.
58" Nordic A-2 ... 29/3
MARAUDER.
65" A2 general contest 17/9

On sale at your Mercury Dealer's NOW

Monocoupe 64", Aeronca 65½"	69/6
Christea Skyjeep, Stinson "105"	34/7
Monocoupe 40"	27/10
Mentor 36" Rubber Contest	11/-
Mallard 48" semi-pylon	22/4
Junior Mallard 36"	18/4
Mk. I Team Racer	28/1
Mk II Team Racer	23/3
New Junior Monitor	23/6
Midge Class "A" Speedster	6/5
Adjustalyne Handle	6/8
Stunt Props all pitches, to 10" diam.	2/0½

Trimstrip transfers, including pennants and chequers to match. Mercury C/L accessories. M.S. Airwheels. E.D. Engines. E.D. Radio-control. Hivac Valves. Solarbo Balsa. Dunlop Rubber. Dowel. Acetate. Fuel Tanks.

YOU CAN DEPEND ON IT

Improved methods of production, which means the elimination of "bottle-necks" and delay, are enabling us to keep well ahead with our programme, so that when MERCURY ANNOUNCES A NEW MODEL, **YOU CAN DEPEND ON IT BEING THERE IN YOUR LOCAL MODEL SHOP ON THE DATE ADVERTISED.** You can, of course, also depend on the quality of Mercury kits, as well. There's something for everybody in the MERCURY range.

MERCURY

For Modern Modellers

Trade enquiries for all lines mentioned in this advertisement to:—

H. J. NICHOLLS, LTD., (WHOLESALE), 308, HOLLOWAY RD., N.7. **'Phone: NORTH 4272-3**

POST IT TO 308

FOR SPEEDIEST DELIVERY ON HOME AND OVERSEAS ORDERS

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E.D. Mk. III Unit	(£7 19 6)	£9 17 11
E.D. Mk. IV 3 Channels Unit	(£20)	£25 0 0
E.D. Mk III Receivers	(60/-)	74/5
F/C Unit complete	—	£7 1 0
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New Ivy Receiver	(70/-)	87/6
New Super Relay	—	30/-
E.D. Reed Unit	(60/-)	75/-
Hivac Valve XFG1	(17/6)	21/4

ACCESSORIES

F/C Potentiometers	—	4/6
F/C Frequency Meters	—	21/6
E.D. Compact Escapements	(18/6)	22/11
E.D. Mk III Escapements	(18/6)	22/11
ECC 950A Receiver	(70/-)	87/6
2- and 3-pin plugs and sockets ...	—	1/6
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XFG1 Valve Base	—	1/3

Ever Ready Batteries, Multicore Solder, etc. always in stock

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We have a specially organised dept. to deal with orders from abroad. Postage can be quoted on receipt of order or send sufficient to cover. Excess will be credited. Prices for overseas shown in brackets.

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Aeronca Sedan	(57/-)	69/6
Monocoupe 64	(57/-)	69/6
K.K.		
Junior 60 ...	(39/6)	48/3
Southerner ...	(48/-)	48/11
E.D.		
Radio Queen	(78/6)	85/-

SECONDHAND MOTORS

All tested and reconditioned

Elfin 1.49 ...	from	45/-
Elfin 2.49 ...	"	50/-
E.D. Bee ...	"	35/-
E.D.2.46	"	55/-
Mills .75 ...	"	40/-

JETEX

Zyra Spaceship	(5/9)	7/-
Zyra with motor ...	(10/11)	13/4
Jeticopter 100	(8/8)	10/7
Flying Wing	(5/9)	7/-
200 Contest Model ...	(8/8)	10/7

MERCURY D.H. TIGER MOTH

True-to-scale (1½ in. to 1 ft.), 33 in. wing span for 0.46 to 0.75 c.c. diesels. With accurately printed and pre-shaped graded Solarbo, full-size plan, stage by stage instructions, tissue, wire, acetate, etc.

(*Overseas Price* 28/6) *Price Inc. P./Tax* **34/7**

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Fuel Cutout Valves ...	—	4/3
ED Clockwork Timers ...	(7/-)	8/7
Elmic Diesel Timers ...	(11/-)	13/5
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Class B ...	(2/6)	3/1
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KLG Spark Plugs ...	(5/6)	6/3

Solarbo, Balsa, Dunlop Rubber, Modelspan Tissue, Cellon, Mercury Fuels, etc.

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E.D. .46 ...	(45/-)	55/-
2.46 ...	(72/6)	82/6
Comp. Spec.	(57/7)	65/-
Mills S75 ...	(55/-)	66/9
Mills P75 ...	(50/-)	60/9
Elfin 1.49 ...	(47/6)	59/5
2.49 ...	(56/-)	70/-
Frog 150 ...	(40/6)	49/6
500 ...	(60/6)	75/-
DC 350 ...	(53/4)	66/8
Allbon 2.8 ...	—	58/-

KITS

We stock K.K., FROG, VERON, MERCURY, and JETEX as advertised. Space prevents detailed lists being given here—but remember—as the makers produce them, WE DELIVER.

DELIVERY BY RETURN

We guarantee that ALL lines shown here can be despatched by us immediately on receipt of order, as well as lines as made available by the manufacturers. Add 1/- postage and packing on orders up to 10/-; 1/6 up to 40/-; over, post free.

HENRY J. NICHOLLS LTD.

308, HOLLOWAY RD., N.7

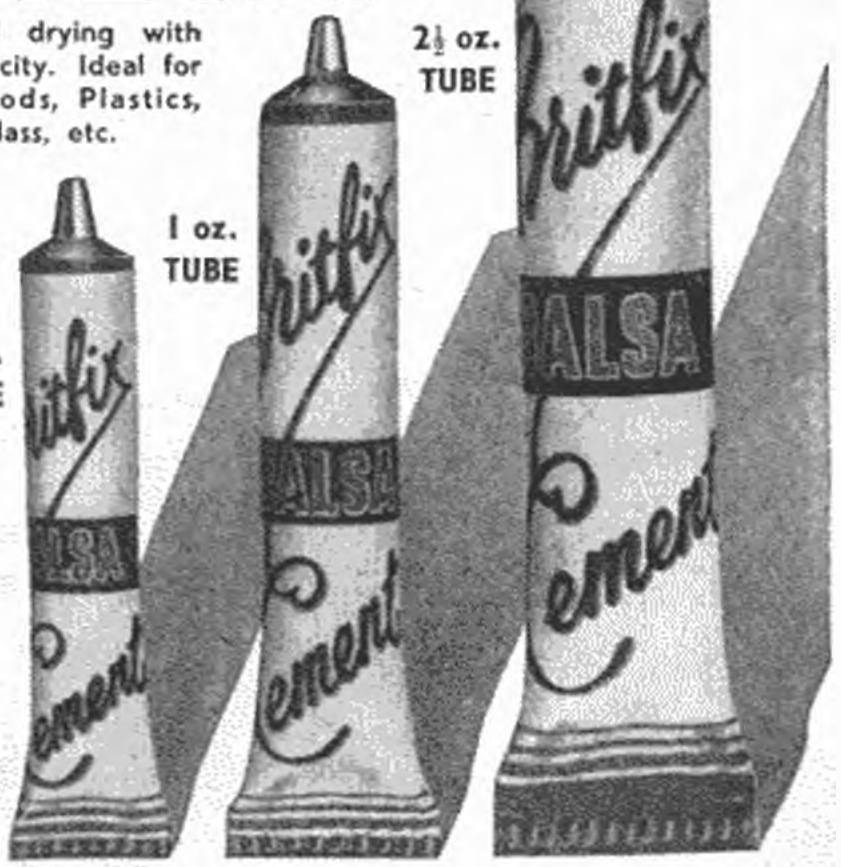
BRITFIX CEMENT

Combines rapid drying with the utmost tenacity. Ideal for Balsa, Hardwoods, Plastics, Leather, Glass, etc.

½ oz. TUBE

1 oz. TUBE

2½ oz. TUBE



Your Guarantee for Reliability

Manufactured by - **THE HUMBER OIL CO. LTD.** MARFLEET • HULL

Say you saw it in MODEL AIRCRAFT

The NEW and SENSATIONAL

Lavochkin 17

The plane with the new and amazing "IMP" propulsion . . .

The appearance of this new model has received enthusiastic approval. It is something REALLY new. Phil Smith, Veron's designer, spent over eighteen months perfecting "IMP"—a ducted impeller. The Lavochkin La 17 is an exact replica of one of the world's most up-to-date fighters. This famous Russian plane has been chosen because its form allows for ease and lightness of construction, coupled with inherent stability of a high order. It's a sheer joy to watch it fly !

DATA :

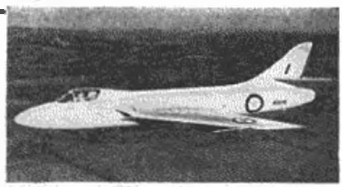
Span 37 in., length 34 in. Designed for use with Diese 'or Glow Plug motors from .5 c.c. up to .87 c.c., such as the Allbon "Dart" .5 c.c., Frog 50, Elfin .5, Mills .75 and the Amco .87. The complete kit contains stage by stage plan, READY MADE IMPELLER and STARTING PULLEY. Graded strip and sheet, quality printed woods, and all the materials including moulded cockpit cover, as well as a wonderful photographically illustrated instruction leaflet showing every stage of construction also hints and tips on starting and flying.

KIT PRICE **30/6** Inc. P.T.

VICKERS 508

SIX MORE SOLIDS !

1/72 SCALE



1067—HUNTER

Here's the latest additions to the range :— **Supermarine 508**, "Butterfly" tailed Naval prototype. **Hawker Hunter** (formerly known as 1067), latest fighter ordered for the R.A.F. and **Venom**, one of Britain's "all-weather" fighters ; also **B.P.111** Delta 2/6, **Cutlass F7U-1** America's 40,000 ft. in 4 min. shipboard interceptor, and the Russian escort fighter **LA 17.** Every kit contains completely detailed plan, a masterpiece of authenticity by Phil Smith. Ready-cut parts, ready-shaped cockpit covers, plastic wheels, transfers of insignia—all are included—everything to make a realistic model.

VENOM N.F. Mk. 2

SOLID RANGE

Hawker P1081	2/6	Cutlass F7U-1	2/6
Vickers 510	2/6	Boulton-Paul P111	2/6
Sabre F-86	2/6	MIG 15	3/4
Supermarine 508	2/6	LA 17	3/4
Venom	2/6	Meteor 8	4/3
Hawker Hunter (1067)	2/6	Canberra B.1	6/11

Photographs by courtesy of "Flight."

★ Ask your local Dealer to show you our latest kits ! ! !

VERON

MODEL AIRCRAFT (Bournemouth) Ltd. Norwood Place, Bournemouth

Tel. : SOUTHBOURNE 2783

R.S. FOR RELIABLE SERVICE

NEW ENGINES

E.D. .46 c.c. Baby	55/-
Elfin " 50 " .5 c.c. diesel	47/6
Dart .5 c.c. diesel	65/2
Mills P .75 c.c. diesel	60/9
Mills S .75 c.c. diesel	64/9
Amco .87 c.c. Mk. II diesel	72/6
E.D. Bee I c.c. diesel	57/6
Elfin " 149 " 1.49 c.c. diesel	59/6
E.D. Comp. Special 2 c.c.	65/-
Elfin " 249 " 2.49 c.c. diesel	70/-
E.D. Mk. III Racer 2.46 c.c.	82/6
Allbon Javelin 1.49 c.c. diesel	68/6
E.D. Mk. IV 3.46 c.c. diesel	82/6
D.C. " 350 " Mk. II 3.5 c.c. diesel	66/8
Eta " 19 " 3.2 c.c. glow	124/5
Frog 500 Petrol	85/-
Frog 500 Glow-plug	75/-

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CONTROL LINE KITS

Elf King 1.5 c.c. stunt	12/6
Ranger Class " A " T.R.	12/10
Mk. II Team Racer Class " A "	17/6
Minibuster Class " A " T.R.	18/4
Pacer Class " B " T.R.	18/4
Mk. I Team Racer Class "B"	22/4
Philibuster Class " B " T.R.	28/8
F.W. " 190 " Scale Stunt	25/8
New Junior Monitor	23/6

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RADIO CONTROL KITS

Skyscooter 1.5-2.5 c.c.	30/6
Junior " 60 " 3.5-5 c.c.	48/3
Southerner " 60 " 2.5-5 c.c.	48/11
Aeronca Sedan 2.5-3.5 c.c	69/6
Monocoupe " 66 " 1.5-3.5 c.c.	69/6
Radio Queen 3.5-7.5 c.c.	85/6

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Veron Cardinal .5-1 c.c.	17/8
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Monocoupe " 40 " .5-1 c.c.	27/10
Stinson " 105 " .5-1 c.c.	34/7
Christlea Skyjeep .5-1 c.c.	34/7
Ladybird .5-1.5 c.c.	22/8
Firefly .75-1.5 c.c.	22/6
Veron LA 17 (Imp)	30/6

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GLIDER KITS

Mercury Marauder A2	17/9
Veron Vortex A2	22/7
Invader 40"	7/11
Soarer Minor 48"	9/9
Cadet 30"	4/11
Chief A2	22/8
Prince 60"	25/-
Diana 36"	9/-
Fortuna 48"	15/-

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JETEX

Jetex " 50 " 13/5, Jetex " 100 " 27/5, Jetex " 200 " 38/9, Jetex " 350 " 52/9, Fuel charges " 50 " unit 2/2, " 100 " unit 2/10, " 200 " unit 3/2, " 350 " unit 3/5. Wicks all units 7½d. Gauzes " 50 " unit 2/1½, " 100 " unit 2/4, " 200 " unit 3/2, " 350 " unit 3/9.

All Jetex Kits as advertised.

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E.D. Mk. III R/C Unit	197/11
E.D. Mk. II Miniature Unit	370/-
E.C.C. 951A Hard Valve Rx	87/6
E.C.C. 950A XFG1 Rx	87/6

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All in perfect condition money back if not satisfactory.

Elfin 149 1.5 c.c.	40/-
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Arden " 199 " (3.2 c.c.)	65/-
McCoy " 19 " (3.2 c.c.)	70/-
Cannon 300 Petrol	40/-
Forster " 99 " (16 c.c.)	200/-
E.D. Bee I c.c.	35/-
Allbon Arrow 1.5 c.c.	30/-
E.D. Mk. IV 3.46 c.c.	50/-
Elfin " 249 " radial	45/-
E.D. 2.46 Racer	55/-
E.D. Comp. Special	35/-
Frog " 160 " 1.6 c.c. glow	25/-
Frog " 500 " 5 c.c. glow	52/6
Amco 3.5 c.c. diesel	57/6
Dooling 29 5 c.c. G.P.	170/-
Yulon Eagle 5 c.c. glow	47/6

Full List on Request

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I have a very large selection of new and second-hand spares in stock. Send S.A.E. for quotation. New or S/H for your damaged parts.

TO ORDER

List your requirements and forward cheque or P.O.—I will do the rest.

C.O.D. service available. Add postage for orders under 20/-.

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NECESSARY ACCESSORIES

Baffle free-flight tanks	1/9
Anka Grip C/L handles	2/6
15 c.c T.R. tanks	3/4
30 c.c. T.R. tanks	3/8
K.L.G. Miniglow plugs	7/4
XFG-1 valves	21/4
Elfin jet assemblies	4/4
Universal jet assemblies	4/4
Britfix cement	7d., 1/- 1/9
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½" rubber bands	6d. per pkt.
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Pilots Class " B "	3/1
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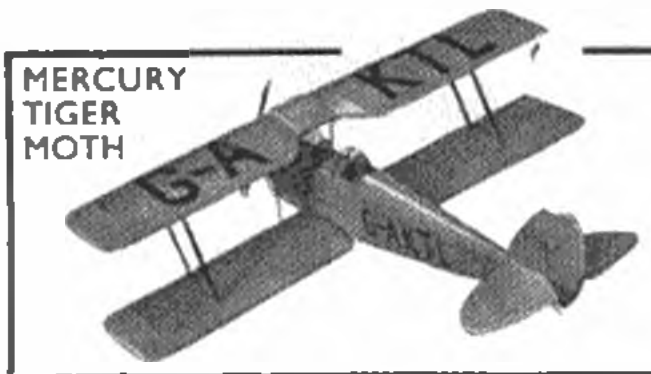
" Solarbo " (minimum order)	5/-
Valveapout fuel cans	3/-
Light Lay Strate 70' 3/4, 100'	4/9

ROLAND SCOTT

THE MODEL SPECIALIST

147, DERBY STREET,
BOLTON, LANCS.

model fuels and finishes



Model Fuels and Finishes Ltd., is an organisation which has been developed specially to market two very famous products for aero-modelling, namely, CELLON finishes and MERCURY fuels. This specialisation has enabled considerable progress to be made both in the quality and variety of the products handled, whilst prices are kept as low as possible. Two other lines, Mercury Aerolac and Mercury Rubber Lubricant complete the programme so far. All these products are available to modellers through regular Mercury Stockists.

for all who take pride in their modelling

CELLON

	2-oz. jar	4-oz. jar	½-pt. tin
Clear Model Dope	1/3	2/-	4/-
Glider Dope	1/3	2/-	4/-
Glossy Coloured Dope (12 colours)	1/6	2/6	5/-
Aluminium Dope	1/6	2/6	5/-
Fuel Proof Lacquer	1/9	3/-	6/-
Sanding Sealer	1/3	2/-	4/-
Banana Oil	1/6	2/6	5/-
Model Dope Thinners	1/-	1/9	3/-
Anti-Blush Thinners	1/-	1/9	3/-
Fuel-Proof Thinners	1/-	1/9	3/-

MERCURY FUELS

In 8 oz. Bottles

No. 1.	Comp. Petrol	2/3
No. 2.	Racing Methanol	3/-
No. 3.	Comp. Diesel	3/-
No. 4.	Comp G. Plug	2/6
No. 5.	Racing G. Plug	3/-
No. 6.	All-in-one Diesel	2/6
No. 7.	Racing Special	4/-
No. 8.	Castor Diesel	3/-
Mercury Ether		3/-

More Mercury Fuels are sold than all other model fuels together.

AEROLAC CLEAR LACQUER

Non-streak, fast drying, high grade. In seven glowing hues 4 oz. jar 2/6. 2 oz. jar 1/6.

Aerolac Thinners
2 oz. bottle 1/-

MERCURY RUBBER LUBRICANT

A genuine blend of pure glycerine and soft soap. 1 oz. bottle. 1/6

MODEL FUELS AND FINISHES LTD., 40A, PARSON'S MEAD, WEST CROYDON, SURREY

It is to your advantage to mention MODEL AIRCRAFT when replying

UNRIVALLED POWER UNIT

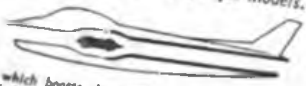
for all flying scale jet planes

Complete outfit containing Jetmaster motor, mounting clip, fuel, wicks, spare parts and full instructions

ONLY 29/4 (Including tax)

JETMASTER THRUST AUGMENTER TUBE

When fitted with the Augmenter Tube, the Jetmaster is the perfect power unit for scale models of jet fighters like the Hawker 1067, Sabre, Attacker, Mig 15, etc. In fact, it is the only motor in the world really suitable for free flight jet models.



The augmenter tube, which boosts the thrust from 1½ oz. to 2½ oz., was developed in co-operation with the Low Speed Aerodynamic Association

Price 5/- + 1/1 tax (including igniter wire and D/T fuse)

THE motor for young modellers!

JETEX 50

OUTFIT

Containing Motor, Fuel, Wicks, Mounting Clip, Spare Parts, Accessories and full instructions.

SPECIFICATION—Thrust ¼ oz. Motor run approx. 15 sec. Weight 3¼ drams. Length 1⅛". Diameter ½". Weight of fuel charge 3½ drams. *Price inc. tax* **13/4**

Ask your dealer to show you the range of Jetex QUALITY kits!

Dura-Jet	1 0 5	Hot Dog	4 3
Mi-Jet	7 9	Jeticopter "50"	7 0
Jet-Ho Hydroplane	8 1	Jeticopter "100"	10 7
Vampire "50"	7 0	Avro 707B	7 0
Vampire "100"	10 7	200 Contest Model	10 7
Race Car	14 9	Zyra Space Ship with motor	13 4
Jet Craft	7 0	Zyra Space Ship Less motor	7 0
Flying Wing	7 0		
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Ready-to-Run Jetex jet propelled models in Plastic

Plastic Racecar (with motor, fuel, etc.), fastest car for its size in the world	18/11
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Plastic Helicopter (with two Jetex 50 motors, fuel, instructions, etc.)	33/-

All trade enquiries for JETEX GOODS should be addressed to the Makers—

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JETEX

Sole U.S.A. Distributors—**MESSRS. AMERICAN TELASCO LIMITED, 55, WEST 42nd STREET, NEW YORK 18, NEW YORK.**
Canadian Distributor—**MESSRS. MODEL CRAFT HOBBIES LIMITED, 44, WELLINGTON STREET, WEST, TORONTO 1, CANADA.**
All other export enquiries to—**BUTLER ROBERTS & CO. LTD., 4, DRAPERS GARDENS, LONDON, E.C.2.**

KEILKRAFT

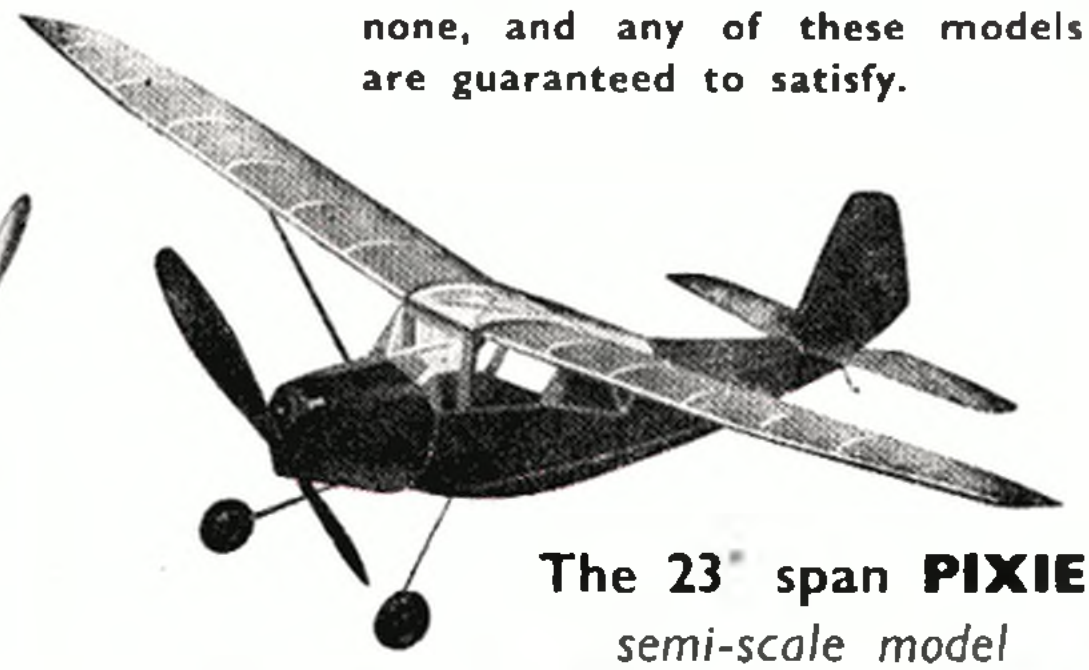
FOR THE BEST DURATION MODELS

If you want the finest designs, clearest plans, and best quality materials—insist on a Keilkraft kit. The K.K. rubber powered duration range is second to none, and any of these models are guaranteed to satisfy.

The 30" span **ACE**

A cabin model of sleek lines and excellent performance. Specially designed for ease of building and good all round flying with the minimum of trouble. Although a lightweight, the Ace is rugged enough to stand up to a lot of rough treatment.

6/1
Inc. Tax

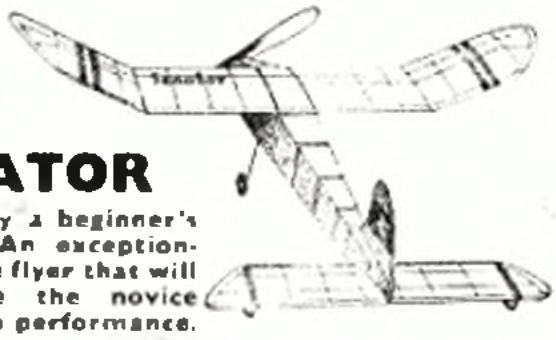


The 23" span **PIXIE**

semi-scale model

Here is a grand little plane that every young modeller will enjoy building and flying. It's realistic appearance and outstanding flying capabilities have made it a firm favourite. Simple, rugged construction, sheeted cowl, and knock-off wings make the Pixie a really tough customer!

4/11
Inc. Tax



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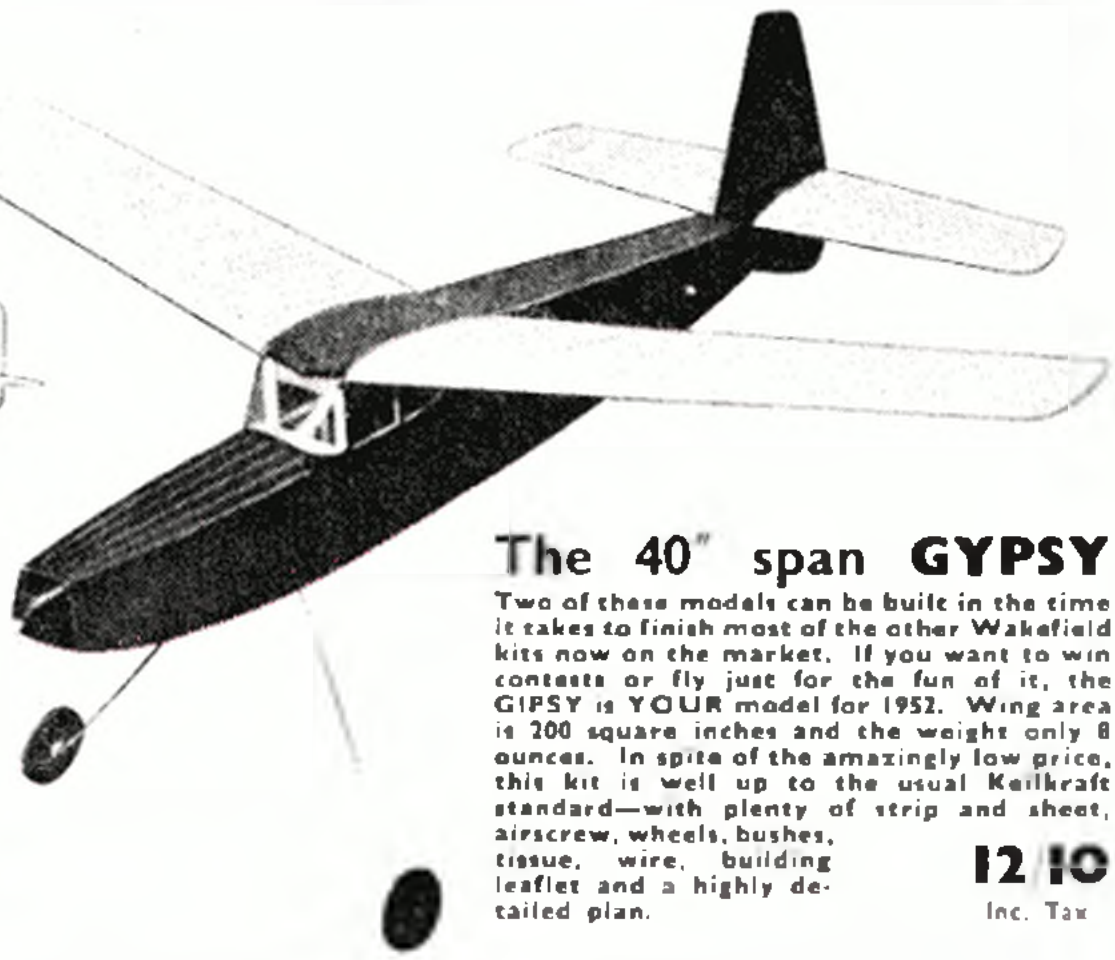

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MODEL AIRCRAFT

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AUGUST 1952 VOL. II No. 8

Contents

EDITORIAL

The controversy aroused by the imposition of the levy on all affiliated clubs, has ended at last. We now know that the resolution dealing with this matter which was passed at the A.G.M., was out of order. At the resumed A.G.M., held recently, the proposition was again put to the meeting, and this time was decisively defeated.

This classic example of hurried—one might almost say panic—legislation, has undoubtedly aroused a good deal of strong feeling in the affiliated clubs, and conclusively proves the point which we have stressed on many occasions : that vitally important matters of this nature should not be finally decided upon before they have been referred to the Clubs and Area Committees for consideration and discussion.

We feel that it would be unfair to criticise too harshly those who were responsible for putting the original proposition forward at the A.G.M.—at least they showed some appreciation of the Society's present financial position and their intentions were good. It must be remembered that the Society has lost over £450 on the year's working, and £1 from each affiliated club would have recouped the Society for this loss. In actual fact only 170 clubs paid the levy, and many of these did so under protest, exception mainly being taken to the manner in which the payment of the levy was demanded.

This unfortunate affair is now over, but the serious financial problem remains. In our Editorial on this subject in the February, 1952 issue of "M.A.," we stated : "We hope that the side issues which have been introduced into this controversial matter will not be allowed to obscure the main fact, which is, that the clubs will have to contribute more to the S.M.A.E. funds in the future if the Society's work is to continue unimpaired."

At the A.G.M. of the Society which is to be held in November next, it is inevitable that the Council will recommend an increase in the present affiliation fees. The clubs will now have had ample warning of this, and should, therefore, see that it is given very careful consideration before the A.G.M. takes place.

Cover Story

J. Owen, who has been well known in the North as a member of the Blackpool & Fylde M.F.C., is now living in the South of England and has joined the Thames Valley club. He is seen in our cover picture launching his Wakefield in the Gutteridge Trophy contest this year.

THE JOURNAL OF THE SOCIETY OF MODEL AERONAUTICAL ENGINEERS

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Here and There

THE EDITOR COMMENTS ON CURRENT TOPICS

THE LONG ARM

The Royle family of Derby, certainly seem to get more than their fair share of excitement out of the Wakefield and A/2 events.

It will be remembered that in 1950 P. Royle gained 2nd place in the Wakefield Trials but, due to an unfortunate interpretation of the rules, lost his place in the British Team which went to Finland.

Last year his father, J. Royle, won the first prize of a free trip to Finland in the Wakefield Draw and travelled to the contest with the British and American Teams.

This year they are both "in the news" as Royle senior gained top place in the Wakefield 100 with three maximum flights and his son is a member of the A/2 team which will be going to Austria in August.

WORDS OF WISDOM

Some remarks by Frank Zaic in a recent letter appeared such sound reasoning that they are worth passing on. Frank maintained that in these days of specialisation many people engaged on full size aircraft design had their ambitions frustrated in that they spent their lives designing parts of aeroplanes, not whole aeroplanes. Aero-modelling, then, would seem a natural outlet. There must be hundreds of such potential "recruits" in this country.

Incidentally, the 1952 edition of the Frank Zaic "Year Book" has recently been published in the United States. Besides numerous plans this book also includes a complete description of many new theories of model design and performance.

IT COULD NEVER HAPPEN . . .

Ripley's "Believe it or Not" features have nothing on model aircraft. Some of the incidents we witnessed at the Digby Trials just should not have happened. For instance, on the extreme downwind side of the aerodrome, nearly a mile from the take-off area, a glider had just landed. Just as we were wondering whether or not to pick it up a Wakefield glided down and landed smack on top of the glider. Both models were damaged and we are still sure that the owners never really believed the true explanation we offered!. . . Two flick rolls by a Wakefield immediately after take-off—and after we had argued that out on the journey home we still had no proper explanation of what could cause such a manoeuvre. . . Fuselages collapsing *after* the motor had been wound and the noseblock in position. Usually the strain is less then than during the last stages of winding. We can only assume that in working down to extremely light structural weights, modellers are approaching the lower limit of safety.

HOW MUCH DOES WEIGHT MATTER?

It has become a common complaint that the junior or less experienced modeller is at a disadvantage in specialised contest flying since he finds it impossible to work down to the low airframe weights achieved by the experts.

But just how much does this matter? We know of two A2 gliders of identical design, one 2 oz. overweight and the other "down to the limit" It is the heavier model which consistently outperforms its lighter counterpart. Then in the London Area Wakefield preliminaries we would take a bet that both of the top two models weigh over 9 oz. One of them, we know, tipped the scales at the 8 oz. mark without the wings.

Rather than take extreme views about lightweight construction let us say that it is nice to be able to work right down to a minimum weight and produce a model which is strong enough. But a certain amount of overweight, provided it is not excessive, is not necessarily a severe handicap. In the long run it will be how the model is trimmed that counts.

RESERVE MODELS

The difference between a contest won and a contest lost is often a lost model. Most serious fliers would rate as the two main advancements in contest rules, first the introduction of the five minute limit and, second, permission to use reserve models, if necessary.

There have been several criticisms levelled against the rules permitting only one *reserve* to be used You can lose or damage *three* models in completing three long flights, so why introduce a rule to minimise the effect of bad luck in this respect, and then partly retract it again?

The main argument in favour of using only one reserve is that this is more fair to people with limited building time. This is something of a fallacy. If a modeller is energetic or enthusiastic enough to build several reserves he *deserves* any advantage accruing. In favour of *not* limiting the number of reserves is the fact that fliers might be more willing to abandon, as lost, a model landing in the middle of a wheatfield, for example.

Any advantage gained by a flier using two or more

models is earned the hard way—and is partly nullified by the fact that he has the responsibility of trimming them all—and trying to remember their individual characteristics.

RE-DISCOVERING THE DIESEL So our American friends are at last re-discovering the diesel. A number of prominent fliers in the United States are now using British-made diesels in preference to their own ½-A and Class "A" glow plug motors. In fact it now seems generally agreed that in the smaller capacities the diesel is superior to the glow motor in performance.

However, there must be a reason why American manufacturers have persisted with small glow motors. After all, American designers have set a world standard in miniature aeromotor layout. What we are getting at is—how about one of our own manufacturers trying a small glow motor? We have a sneaking suspicion that small glow motors might prove easier starting for "sport" flying, although outperformed by their diesel counterparts.

THERE'S ALWAYS NEXT YEAR Only one man can come out on top in a contest and, in the case of trials, only a strictly limited number are lucky enough to win places. To the others the traditional thought is "There's always next year." There is no finality in model aircraft and bad luck one year is more often than not balanced by good luck the next.

We recommend this thought to some of the disappointed Trials entrants. So many contests are won by the other fellow making mistakes and this is one thing you can try to eliminate from your own flying. Luck of the weather, you can do little about. But no regular flier has persistent bad luck in this respect. It is amazing how "luck" does average out over a period.

U.S.A.F.E. CHAMPIONSHIPS In company with Henry J. Nicholls, Harry Hundleby and G. Honnest-Redlich, we recently flew to Wiesbaden in the American Zone of Germany to act as judges at the U.S.A.F.E. Model Aircraft Championships. This turned out to be a very interesting and well organised meeting, attended by some sixty competitors who had travelled from almost every U.S. Command in Europe and Africa to compete.

The contest winners will be sent to the U.S.A.F. Championships which are to be held at Amarillo, Texas, being specially "posted" there for ten days for this purpose.

The meeting was sponsored by the Wiesbaden Wing and Wheel Club and the Contest Director, Captain J. A. Hauser and his band of helpers did a fine job, as a result the four British judges had an extremely easy task.

WATCH THE BIRDIE! When travelling around the contests taking photographs for the picture pages in MODEL AIRCRAFT, it has been interesting—and often amusing—to see the various reactions of model fliers when faced with the editorial camera.

Many well-known competition fliers—Copland, Knight and Marcus among them—have a "thing" about having their models photographed before a contest flight. Naturally we respect their wishes—and take the picture when they are not looking! But modellers generally are most co-operative when a picture is suggested, and are only too pleased to do anything to help the photographer. They will gladly take any model to pieces—even their own—or assemble it in a howling gale.

The other week-end, however, we met an exception to the rule. We were at Fairlop, looking around for a picture with which to finish off a roll of film, when we saw a model standing beside a club motor-coach. There was nothing very remarkable about the model, but it seemed worth this last picture, so we approached the owner for permission to photograph it. He eyed us suspiciously.

"Is it for yourself or for publication in one of the magazines?" he demanded, moving protectively in front of his creation.

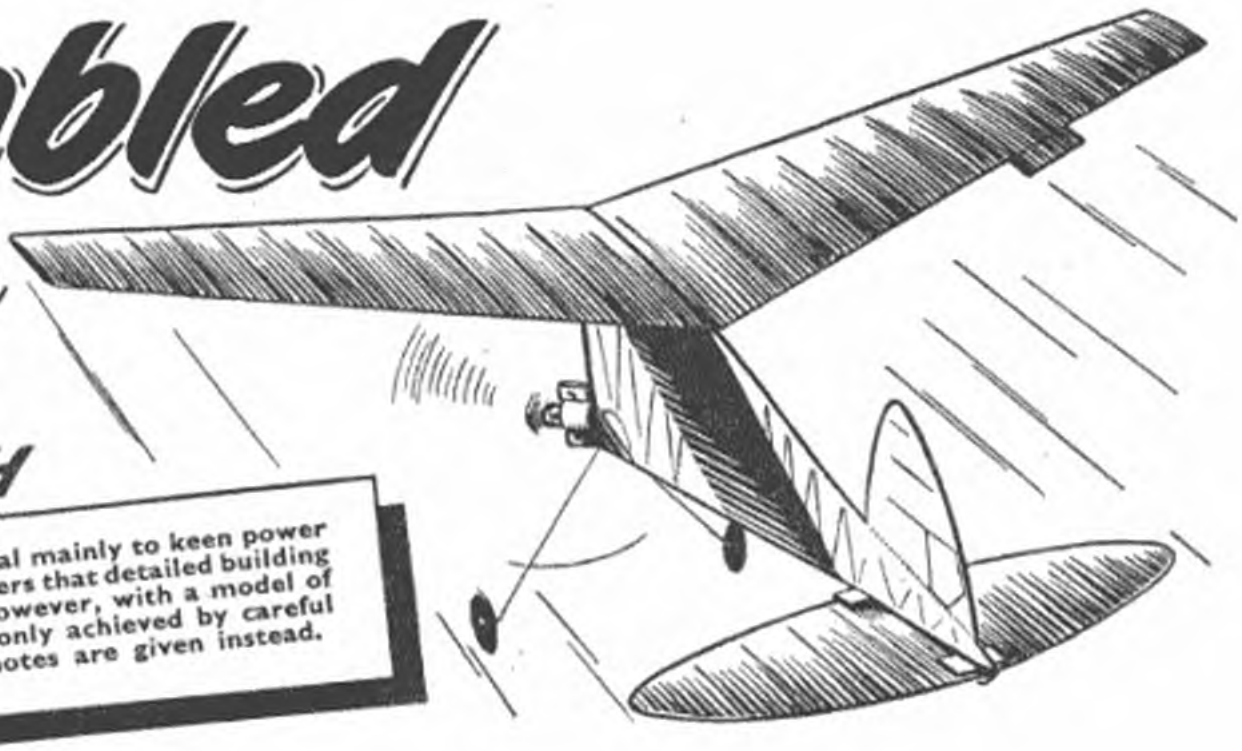
"It's for possible publication" we cheerfully assured him, expecting the usual immediate co-operation. But "No blooming fear!" was the reaction and he grabbed the model, hustled it into the coach and sat glaring at us through the window.

We finished off the film with a picture of some clouds. No-one raised any objection.

G. Honnest-Redlich, one of the judges, talking with two of the competitors at the U.S.A.F.E. Championships at Wiesbaden.

Scrambled Egg

by T. W. SMITH



● As this model is one that will appeal mainly to keen power duration enthusiasts, the author considers that detailed building instructions would be superfluous. However, with a model of this type, maximum performance is only achieved by careful trimming, and therefore trimming notes are given instead.

FIRST check all surfaces for warps, then examine wing line up and wing tail fixings. Any faults must be eliminated before attempting to fly. With the wing at the central position in the main spar slot, modify the tail packing until the model just stalls. Bend the wing tab down slightly ; the model should then glide slightly to the right with the rudder tab central. Do *not* overdo the wing tab setting (30 deg. down is maximum). The preliminary short power-on flights over long, thick grass should be done with the engine adjusted to run smoothly. Experience has shown that it is very unwise to make short power-on flights with low or irregular engine revs. The first power-on flight should be with a 3 sec. motor run; this will usually consist of fuel in the connecting tube only.

(1) Using an 8 in. × 5 in. prop, launch into wind (if any) at about 30 deg. nose up with 3 sec. fuel. If model turns or rolls viciously to the right or left, increase or reduce respectively the left sidethrust. Repeat this with 3 sec. fuel until the model climbs straight or slightly right from a hand launch.

(2) Note the manner in which the model behaves towards the end of the engine run. If the model appears to be turning rapidly to the right, reduce the wing tab angle. If the model appears to begin to loop, slightly increase the wing tab angle—if this does not cure the loop, increase the angle of downthrust *or* move the wing forward and increase the tailplane incidence until the model again just stalls on the glide.

(3) When absolutely satisfied that nothing dangerous is incipient, the power run can be increased to 5 sec. The aim is now to get the model to go into a mild right-hand turn with the *inside* wing rising in the turn so that the model begins a very steep spiral. This is done by varying the wing tab setting, remembering at the same time that more down tab angle increases its climb *drag* as well as its lift, resulting in a tighter turn. A small amount of *left* rudder must therefore be used to counteract this (the rudder is very, very sensitive, so go carefully !). When this treatment results in the model beginning the vertical spiral, the engine run can be *gradually* increased.

(4) The glide turn can now be obtained by suitable combination of sidethrust and rudder tab, i.e., if more right turn is desired, *increase left* sidethrust and move the rudder tab over to the *right* (remembering that it is very sensitive). Repeat the procedure of (1), (2) and (3)to make sure the climb trim is unchanged.

With the above trim and a glide turn to the right, the transition from power to glide is rapid and free from oscillations, because the model swings sharply into a right hand turn when the motor cuts due to loss of sidethrust effect on the fin, thus bringing the model nicely into the glide circle.

Safer Method

Using a fine pitch prop (say 3 in. pitch) of the same diameter 8 in. the above instructions can be followed until the time comes to increase the motor run to 5 sec. . . (1) and (2). The prop is then changed to 8 in. × 5 in. and the procedure (1) to (4) carried out.

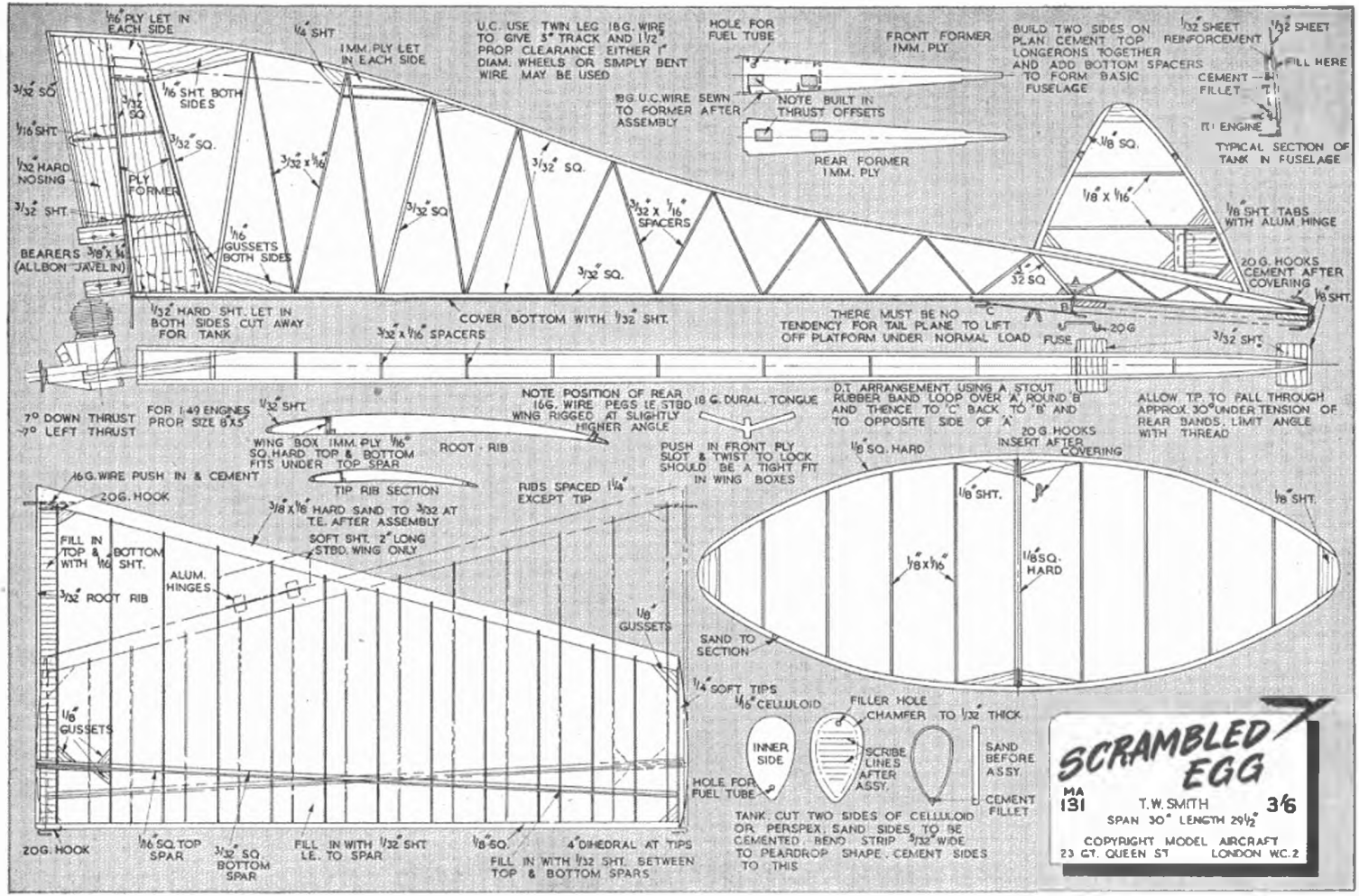
Competition Flying

Determine needle setting and compression for position for maximum power by any convenient method. It is preferable to fix the needle position permanently and mark the compression bar position if it is necessary to change the compression for starting. Mark and check the fuel tank graduations for 10, 15 and 20 sec. running with these needle and compression settings.

Test fly preferably on the day before the competition with a sufficiently long engine run to show the first part of the spiral (5 to 10 sec.). Dismantle the model after fixing the tab positions and carefully marking the wing and tail positions. Make sure the tail packing is securely glued in place. Place the wing undersurfaces together and note any relative warps. Fix these by placing packing between the wings and clamp the wings together with rubber bands.

Note

This type of model is designed to excel by its *climb*. With reasonable trim an average ratio of 15 should be achieved.



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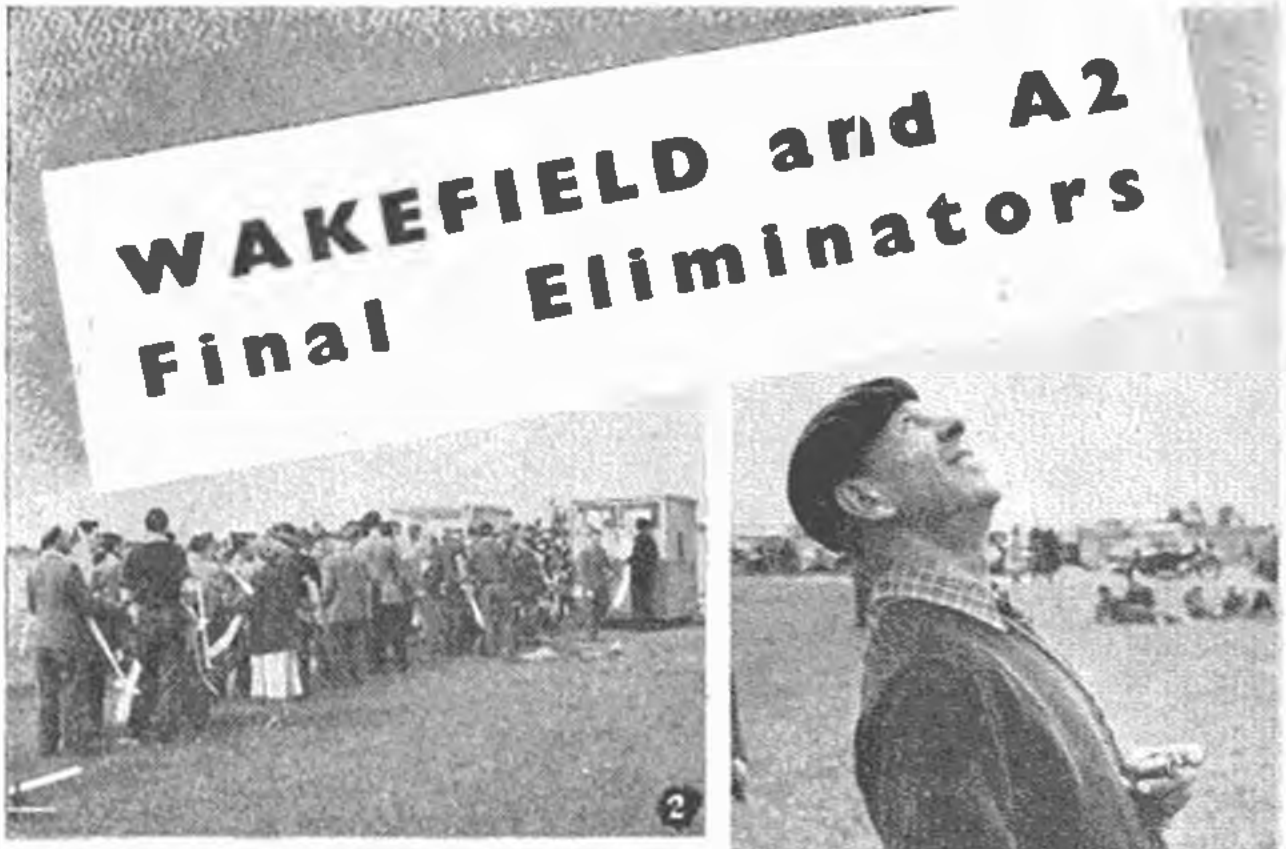
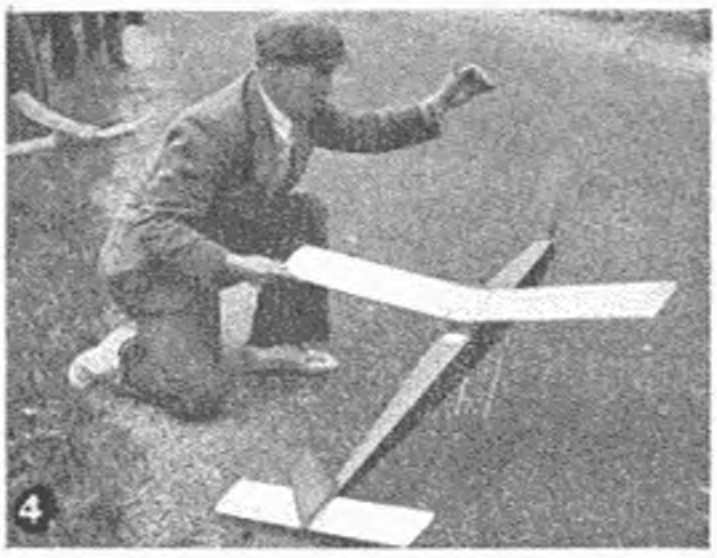
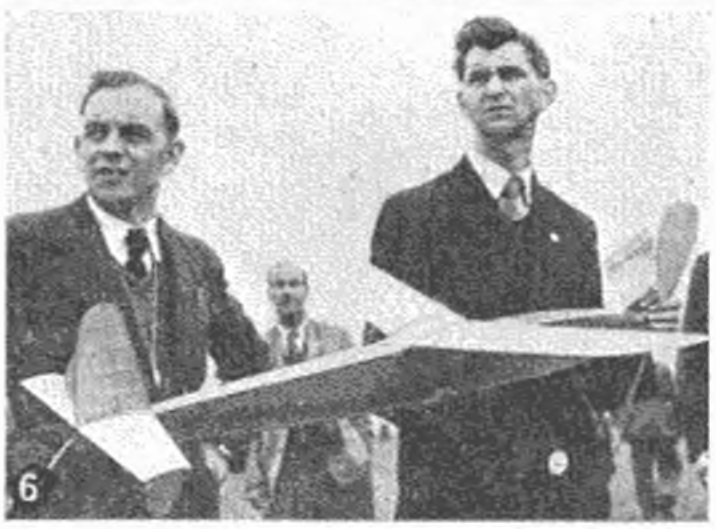
WAKEFIELD and A2 Final Eliminators





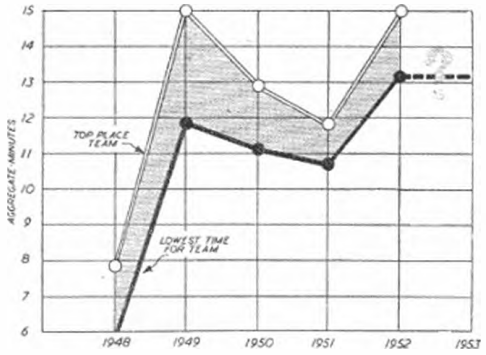
1. P. J. Royle (Littleover) juggled successfully with a towline to qualify for the glider team.
2. Queueing to draw for flying order.
3. Silvio Lanfranchi took office as timekeeper.
4. Jack North (Croydon) launching for his first flight.
5. Ron Warring launching for a max. in the second round.
6. Henry Tubbs watches anxiously as a rival model climbs.
7. J. Gorham launching his Wakefield.
8. Alan Hewitt brings in his glider for processing.
9. George Fuller (St. Albans) used wing end-plates on his A-2.
10. W. Farrance topped the glider results with three maximums, and 8 min. in the flyoff.
11. P. Fox (Prestwick) launching B. Harris's glider.
12. G. M. Byrd (Loughborough Coll.) qualified for both glider and power teams.



REPORT on the TRIALS

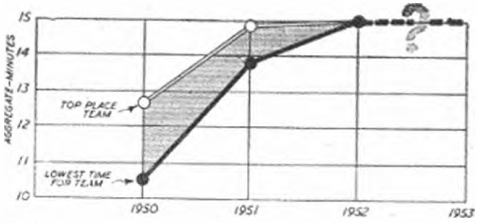
SINCE the last issue of MODEL AIRCRAFT appeared history has been made in that, for the first time, British team trials have been held in all three free flight classes, these three teams destined for Sweden (for the Wakefield), Austria (A2 glider) and Switzerland (power). We hope that none of them is unduly superstitious for it is on *thirteen* individuals that the responsibility of bringing these world championship trophies back to this country will rest—thirteen fliers because one, G. Byrd, has won a place in both the Power and A.2 teams. There is almost another "double." The Royle family, father and son, win places in the Wakefield and A.2 teams respectively. It was P. J. Royle, the junior member of this aeromodelling family, who so nearly went to Finland with the 1950 Wakefield team. He placed in the top six in the Trials that year but unfortunately on checking his model was found to be not up to specification. The following year Royle senior proved that good luck often follows bad luck and won the Wakefield draw for a free trip to Finland! Let us hope that the Royle luck holds good in Sweden and Austria.

1952 seems to have been a year for all-rounders. Ray Monks, who so nearly won the A.2 event in Yugoslavia last year, finds a place in the 1952 Power team. Jack North, who had several successes in the early S.M.A.E. contests also made the grade in the power trials. He also qualified and flew in both the Wakefield and Nordic "100," but perhaps this was too much to attempt on one day. G. N. Byrd is the first man to qualify for two full international teams in the same season and joins Monks (1951-52) and R. Hinks, of Luton (1949-50), in the unique distinction of achieving double international honours.



Highest and lowest Wakefield qualifying times are converging, although weather conditions influence the results.

Leading man in experience of International contest flying is Ron Warring, who is in the Wakefield team again for the third time in the past four years. This incidentally, will be Ron's ninth British "cap," all in post-war flying. Whilst the remaining team members are first-time internationals, most are already known for their achievements on the flying field—just reward for persistent effort. There are, of course, the disappointments—the acknowledged glider experts like Roy Yeabsley, Butler, etc.,



Nordic team qualifying times show a marked increase in the standard required.

Wakefield fliers Evans, Gorham, Chesterton, J. B. Knight, Monkhouse, Copland, etc.; all-rounder Marcus, and a good many others for whom it just was not a lucky day. Model flying is like that. The honours go round year by year. Any attempt to guess a team before the Trials is usually as far out as the average punter's forecast of the Derby placings. Capt. Taylor, the S.M.A.E. competition secretary, had his own list of ten, from whom he was confident that a majority would fill the top six Wakefield places. Only one turned up!

On paper the *Power* team appears strongest. We personally have little experience of Byrd's capabilities in this field, but undoubtedly he is a very fine flier, right on peak form this season. The other three are all real experts in power duration and, given an even break, we see great hopes of the 1953 Power International being held in this country. Any one of the four is capable of doing the trick.

The A.2 team is also well experienced. Farrance is a Northern flier who has already done well this season and Mike King is also far from unknown in this sphere. Royle we still think of as a Wakefield man, but anyone who can achieve three maximums

1. *The 1952 British power team : (L. to R.) P. Buskell (Surbiton), G. Byrd (Loughboro Coll.). Ray Monks (Birmingham), R. J. North (Croydon).*
2. *G. Byrd also won a place in the glider team.*
3. *The Wakefield team once more includes R. H. Warring.*
4. *M. A. King was another " triple max." glider man.*
5. *R. Sandy's unusual pod-and-boom Wakefield performed well in the " 100."*

in a Trials is good enough for our money. All four A.2 team members did just that !

The Wakefield team ? Well, we have a nice diversity of models. Royle as top man with three maximums had a beautifully trimmed " orthodox " model in the modern trend (diamond fuselage, cabin-type parasol, longish fuselage with a single skein motor). Warring's model was a shoulder wing diamond with return gears and a two-and-a-half minute power run, which normally has to be in a down-draught to come down in less than 4½ min. O'Donnel, of Whitefield, has been a persistent Wakefield flier for a good many years now and his name is not unknown in previous competition lists. Albone, of Croydon, is a flier of some experience who is, perhaps, relatively unknown outside the London area, but certainly flew his shoulder-wing machine extremely well. Dunkley carries on the tradition of one Northampton club member, at least, getting into every post-war Wakefield team and for those who think first of Evans when they think of " Northampton Wakefields " remember that Dunkley placed higher in last season's overall results. That in itself is something of an achievement, for Ted Evans had, probably, the most outstanding model at the Trials and was unlucky not to have placed in the top six. The one relatively " unknown " in the team is Nicole, of West Middlesex, but as previous Wakefields have shown us it is often the dark horse who comes out best.

As to the Trials themselves, the Power Trials were flown off on Whit-Sunday, at Fairlop. The weather was far from ideal, with a strong south-west wind, cold, with intermittent heavy showers and bright periods. Visibility at times was down to around the two minute mark and flights in excess of this were usually carried well out of the airfield. Hence the top aggregate of nearly twelve minutes was a remarkable achievement under such conditions. As the results show, times drop by nearly five minutes to the fourth place.

Chief impression of this meeting was the outstanding rate of climb achieved by the modern power duration model. After a full power run some models were mere specks in the sky. The wind did nothing to improve take-off conditions and it was during the initial seconds of flight that the danger of a crack-up was greatest.

Not all models followed the same pattern, but most, it appeared, took off fast and fairly flat, nosing up into a rapid climb. A gust of wind pushing one wing down at this stage sometimes produced a low altitude turn at high speed, taxing the model's spiral stability to the limit. Trimming must, undoubtedly, be carried to very fine limits for consistent power duration flying under all conditions.

Design has far from stagnated around the medium-pylon layout. This is still the most popular, but there were high thrust-line models performing almost equally as well. We say " almost " for the general impression was that the normal pylon design still had the edge on climb. Actual rate of climb was then more or less a matter of how much power was available from the motor used.

The Wakefield and Nordic Trials were held one week later at Digby. The original intention had been to make this a two-day meeting, starting on the Saturday evening and completing the Wakefield before starting on the A.2 flights. As things turned out it was impossible to arrange the necessary local accommodation and so both Trials had to be flown concurrently on the Sunday. A considerable number of fliers camped out in tents and cars on the airfield on the Saturday night, others put up at Sleaford or Lincoln, whilst the remainder journeyed up through the night to arrive early on the Sunday morning, contest flying being scheduled to start at 10.0 a.m.

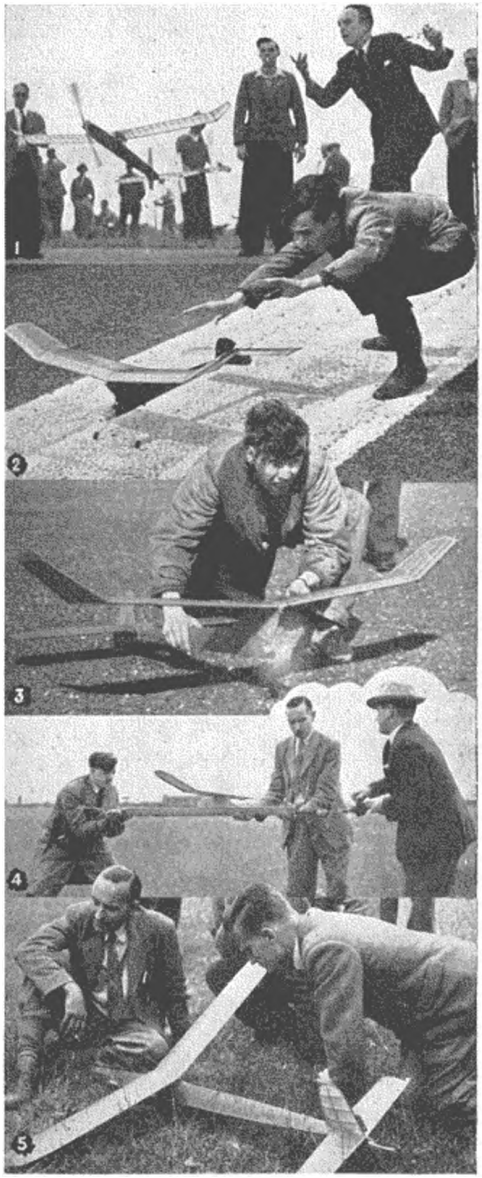
Saturday night gave promise of at least a reasonable day to follow. A gusty wind died eventually to next to nothing as the sun set, although the air was quite cold. Much last minute testing and trimming was going on all over the airfield, to be continued as wordy argument until the early hours of the morning by the camping contingent when darkness made further flying impossible.

Sunday produced a dull, overcast day with a continually changing sky. The wind was light, if gusty at times, but the air was certainly not "still" in a vertical direction. Over the first period of flying the air appeared to be in two "layers." Lower down there was an area of general sink, and above it another deeper layer where the air was ascending gently. There was, in other words, both "lift" and "downdraughts" and similar conditions persisted throughout the day. There were brighter periods when lift predominated, and others when the prevailing air direction was "down." Both "lift" and "down," on the other hand, were comparatively mild—no vicious thermals whisking a model to a great height in a matter of a minute or so. Models in lift, however, did reach a considerable height in five minutes' flying time and took another three or four to descend with dethermaliser operated. Hence, even with a comparatively low drift, quite a number of models were lost and reserves had to be brought out.

Contrary to opinions expressed previously by many people on hearing of a "one-day trials" the organisation functioned extremely well. First round of the Wakefield was finished in just over an hour and a quarter and the A2 took little longer. No rigid order of flying was enforced and so, apart from the inevitable queue some time after the first round started, most fliers had a fair chance of picking the period in which they wished to fly. There were plenty of timekeepers and no great hold-ups anywhere.

In the A.2 trials, as it turned out, anyone who missed a "maximum" on any round was automatically out. A large number of "double maximums" after the first two rounds finally resolved into four "treble maximums" at the end of the third round. All the other hopefuls with aggregates of 14 min. plus automatically became also rans. The standard of flying was just as high as that.

The gliders, on the whole, appeared to make thermal flights with far more regularity than their Wakefield counterparts. The standard of flying



1. *W. Royle came top of the Wakefield trials.*
2. *However, Gorham was out of luck in both Wakefield and power.*
3. *Ray Monks gained a place in the power team.*
4. *R. A. Meanwell's long-fuselage model was based on a design by America's Hank Cole.*
5. *For this year's Wakefield, Evans abandoned feathering props in favour of folders.*

was very high. Models which did not tow up straight and come overhead were almost the exception rather than the rule, although conditions for towing were good. There was no troublesome wind to upset towline stability.

Quite a number of models, too, were visibly " held " on the line at the top of the climb whilst the launcher " felt " for thermal lift before releasing, in the best Scandinavian tradition.

The best of the Wakefields climbed higher than the release height of the gliders but, of course, literally " took their weather with them." No searching around at the top of their climb for lift for them ! Neglecting the poor flights of badly trimmed models (and these were very few indeed) we would say that roughly two-fifths of all the flights had some thermal assistance whilst the remainder were about equally divided between those influenced by down draughts and those in normal air, or " still " in the sense that the air had no vertical movement.

There are few outstanding designs in either class—possibly because we have come to accept the 40-45 in. long diamond fuselage as orthodox for the modern Wakefield and the high-wing slab-sider type with moderately high aspect ratio wings and tip dihedral for " Nordics." But in the Wakefield class in particular, the standard of workmanship was extremely high. A few years ago the really well built Wakefield stood out. Now it is just one of many. The majority of models, too, appeared better trimmed than in previous years with a general tendency to aim for maximum height under power.

In the Wakefield " 100 " there were a few new ideas which attracted attention. A pod and boom type fuselage confounded its critics by a splendid flight performance. Detail design points of note were—Ron Warring's method of attaching split wings to a diamond fuselage in the shoulder position (wings locating on the sides of the fuselage and locked by a single wire strut) ; a well made folding propeller which moved forwards as it folded to compensate for c.g. shift ; a tail trimming device used by Dennis Lees which increased the tailplane (negative) incidence towards the end of the power run for greater height and optimum glide trim.

The long fuselage models, on the whole, were not a success. Most came to grief through structural failure of one sort or another. Ted Evans's model really comes into the long fuselage category and this did fly consistently and well. He was using a folding propeller this year. There were just three streamliners (one a full monocoque) and three models using return gears.

In the glider " 100 " there were anything up to a dozen *Toothpick* style models, most of which flew quite well, but none impressed as the equal of Czepa's original. *Toothpick* influence was evident in many other designs with a cutting down of fuselage wetted areas. There was also an increasing proportion of models using very short nose lengths and a general trend to increase the tailplane moment arm, using smaller tailplane areas.

By contrast top A.2 model (Farrance having won the fly-off) was almost startlingly orthodox. Obviously an old, well-tried machine it gave a perfect account of itself, both on the towline and in the air, making one wonder just how much these so-called design refinements really matter when it comes to normal contest work.

Design refinements most likely to pay off appear to be those concerned with airframe construction—lighter, rigid structures for Wakefield fuselages; warp-resistant wings and tails for all models. In this respect we did notice an increasing proportion of geodetic tails and at least one pair of geodetic wings. Diagonal longeron construction has become almost standard for diamond fuselages, despite the greater difficulty of construction, and internal cotton bracing was commonly employed.

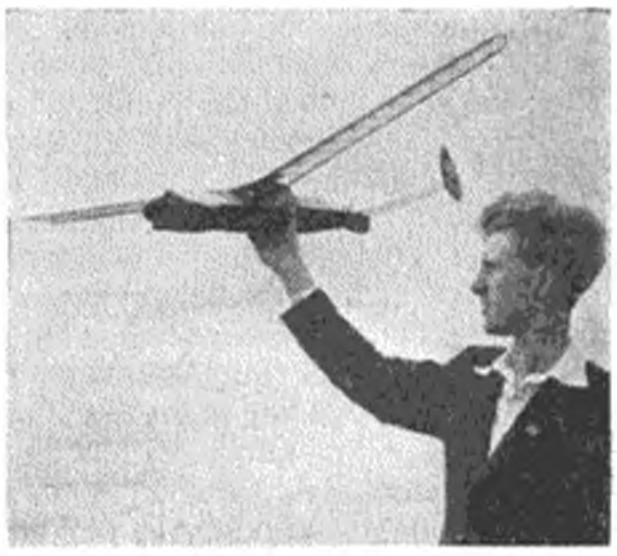
And now for the people who did not make the teams—how good have you got to be to get in in 1953 ? Well, the two diagrams show just how the *minimum* aggregate times to qualify are going up and up. Very soon the only way of getting into an international team will be to produce a model which does a maximum each flight.

In the meantime we will leave with thoughts of an exciting and pleasant Sunday in Lincolnshire, congratulate the various team members and wish them all success in the forthcoming championship events.

Next year we want those trophies back in this country !

A. G. Albone, who placed in the Wakefield team, with his model.

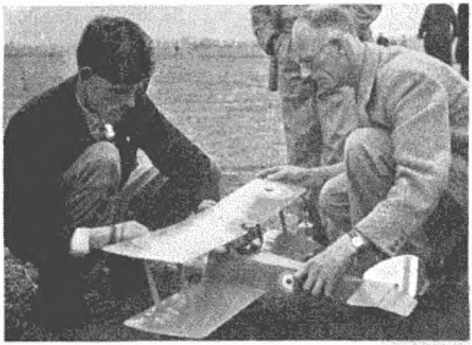
A toothpick type model by Tony Cook, launched by Michael Bird.



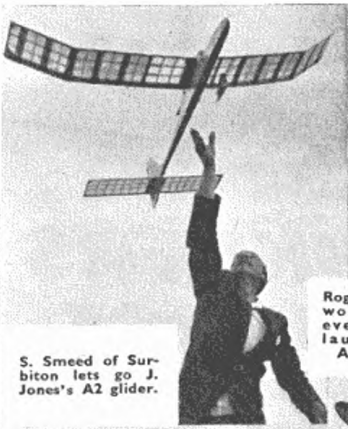
Nicole's model has a folding prop and geodetic wings.

1952 WEST ESSEX
Gala Day

In spite of the poor weather that prevailed at Fairlop in the morning, this year's Gala had a higher attendance than ever before, and the West Essex Aeromodellers wish to thank all those whose assistance helped to make the meeting such a success.



D. Holt of Goldaming (left) starting up the Frog "500" of his C.L "Sopwith Pup," with assistance of J. C. Snaith.



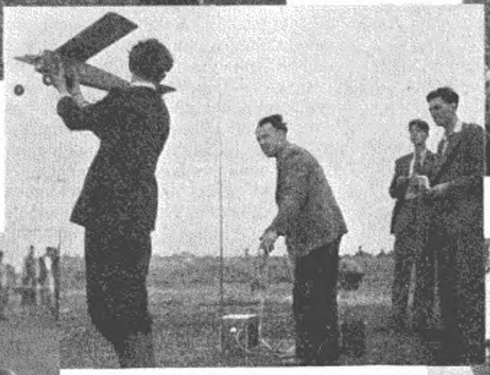
S. Smeed of Surbiton lets go J. Jones's A2 glider.

Roger Clark who won the radio event, is seen launching Sid Allen's model.

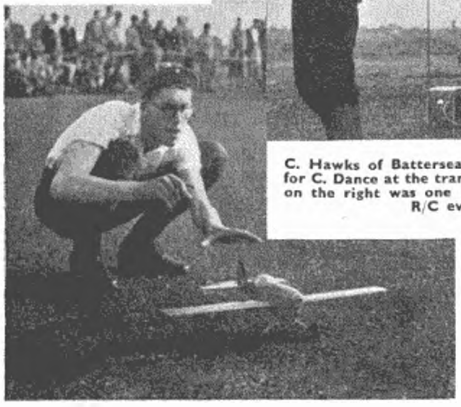
P. Buskell (Surbiton) won the power event with this replica of his Trials winner.

M. Mayhew (Apsley) who was second in the glider event, launching his rubber model.

A husband and wife team race crew. Mr. and Mrs. Hayward (Chingford) with J. Hall's racer.



Bill Dean and his new pylon design with geodetic wings and an E.D. 2.46. G. McLachlan assists.



C. Hawks of Battersea prepares to launch for C. Dance at the transmitter. Den Allen on the right was one of the judges in the R/C event.

(Left) The Harrow M.F.C. Class "B" team racer is sent on its way.

The Goldalming club's Class "B" entry was R. F. Bourne's "Bluebottle," a C. S. West design. The crew were T. Redman and J. Snaith.

The MODEL AIRCRAFT BEGINNERS COURSE

● In presenting the first instalment of the "M.A." Beginner's Course, we are responding to appeals from many of our ever-increasing numbers of new readers. In the early stages of taking up the hobby, the beginner finds there is very little information available explaining in simple language the fundamental principles of building and flying model aircraft.

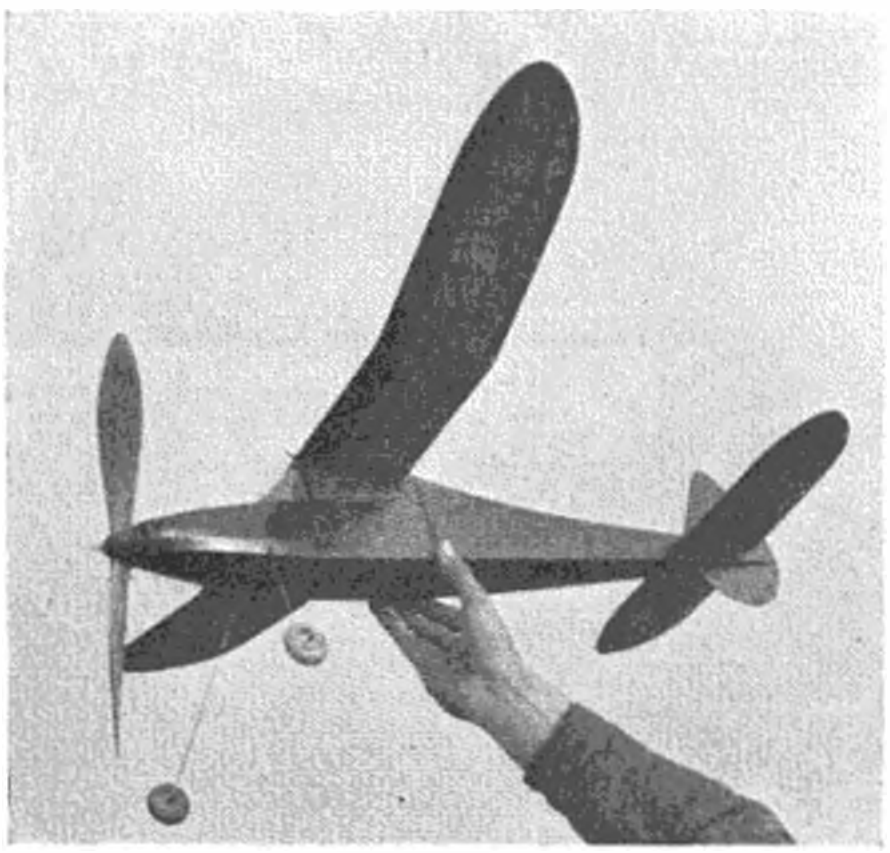
The instructions supplied with kits sometimes merely gloss over many basic points that the newcomer to the hobby finds confusing and difficult to grasp, and it is these points that the course is intended to cover, in this and subsequent articles.

IF you are new to the ranks of aeromodellers and I have only just started to build model aircraft, this new series should be of interest to you.

If you are a complete stranger to the hobby but are curious to know more about it—and we are sure that, having taken the trouble to look at this copy of MODEL AIRCRAFT, you are not entirely disinterested —please read on : we hope that this introductory article will give you some idea of the various activities of model aircraft enthusiasts and of the types of models used, and that you may also be persuaded to join our ranks yourself.

Before going further, however, let us give some straight answers to the sort of questions which would-be modellers often ask :

"*Isn't building a model aeroplane rather difficult?*"—Not at all. Structures may look complicated, but the material we mainly use, balsa-wood, is extremely easy to work with, while assembly work is simplified by the method, universally employed, of building directly over a full-size plan, using quick-drying adhesives.



The rubber-driven model, once the mainstay of the hobby, has now been largely superseded by engine-driven models, although the rubber enthusiasts still include many of the country's top fliers.

"*But aren't I too old (or too young) for this sort of thing?*"—No! The majority of the country's leading model fliers have long since passed their schooldays. On the other hand, there are plenty of simple, straightforward model designs at which even the youngest beginner can try his hand before attempting more advanced projects.

"*How much will it cost?*"—Less than most other hobbies. A practical flying model can be built for less than ten shillings, including dopes, adhesives, etc.

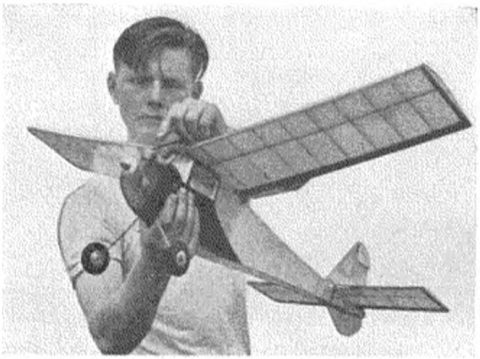
"*Do I need many tools or other equipment?*"—No. Again, this is where aeromodelling is cheaper than most hobbies. To build a beginner's model from a kit, you will probably need nothing more than a razor blade and a small brush. As you progress with more advanced models, you will find it worth while to have a few simple hand tools—none of them expensive.

"*What is the best way to make a start?*"—Buy a simple kit. This will teach you more about the art of model aeroplane construction than a whole bookful of written matter. Constructional methods are basically similar for all model aircraft. Once you have built a model successfully, you will be capable of tackling almost any type, although, of course, it is advisable to build one or two intermediate models before trying advanced designs.

Model aircraft are of numerous different types and perhaps the best way to describe them is to take them in chronological order. We can touch only very briefly on the history of the movement in this article, but it will be seen how tremendous has been the progress during the past few years and how the many and varied types of models have come about.

Model aeroplanes go back to the earliest times of aircraft ; in fact, before a full-size aircraft had flown, models had demonstrated heavier-than-air flight. One calls to mind the efforts of Henson and Stringfellow, a hundred years ago, with steam-powered models, and of the Frenchmen Penaud and Jobert in the 1870's, who were the first to use strip rubber as a means of motive power. However, it is with the last twenty years or so that we are mainly concerned.

Prior to 1930, practically all models were rubber-



Post-war modelling has seen a tremendous increase in the popularity of models powered by small engines. The advent of diesel and glowplug engines has eliminated ignition faults which troubled earlier power models.

powered. They were built mainly of spruce, birch and steel wire with oiled silk covered flying surfaces and, occasionally, with doped silk covered fuselages, but often with a simple spar in place of this later component. A few, somewhat larger models were successfully powered with small compressed-air motors. Gliders were also built, but were not very popular among serious enthusiasts in this country. Then balsa wood was introduced to the movement by the Americans.

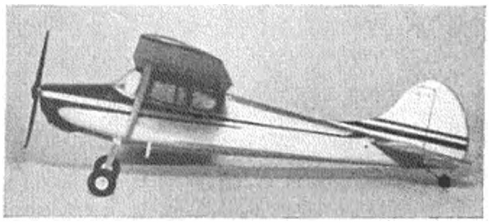
Balsa revolutionised the hobby. It is difficult to see how aeromodelling could have achieved its present popularity without this wonderful material which, by its extreme lightness and the ease with which it can be worked, has enabled us to build vastly better models and has encouraged infinitely greater numbers to take up the hobby.

Balsa is supplied in a large variety of sizes and sections, in strip, sheet or block form. So many are the sizes available that the framework of any model can be built from stock size strips, while other parts, such as wing-ribs, are simple and quickly cut out, with a razor blade or modelling knife, from sheet balsa.

Rubber driven duration-type models, built of balsa, may be made so light that more than half their total weight can consist of rubber-strip. This enables the model to reach a great altitude before the power-run is exhausted, greatly contributing to the gliding time and thus to the total duration of the flight. The modern Wakefield class rubber model, weighing a little over 8 oz., is often capable of a still-air flight of some four minutes, which, although it may not sound very much, is really quite a long time and is usually enough to take a model out of sight. These models, built to the Wakefield International Trophy specification, are generally about 45 in. wingspan. In the twenty-four years since this competition was instituted, the Wakefield has become highly specialised and it is recognised as presenting the greatest challenge to the competition flier. Wakefield and other rubber models are covered with a special lightweight tissue paper, which is then painted with cellulose dopes to render it air-proof and to tighten it and thus make the structure more rigid.

Besides the Wakefield class, there are many rubber-driven types. These include other, smaller and lighter duration types and also scale models, which include a large variety of inexpensive kit designs. For larger models, however, the small internal-combustion engine is now used exclusively.

A petrol engined model aeroplane had been flown in England as far back as 1914, but it was not until the early 'thirties that suitable sized units for general use first started to appear. Col. C. E. Bowden, using first a 28 c.c. model power-boat engine of American origin, and, later, a 15 c.c. engine designed by Edgar T. Westbury, of *The Model Engineer*, pioneered the power driven model, as we now know it, in Britain. Meanwhile, in the United States, Maxwell Bassett, using a 10 c.c. engine designed by William Brown, and Bill Atwood with his famous 6 c.c. " Baby-Cyclone " engine, clearly demonstrated the practicability of a really small petrol engine for model aeroplanes. The " Brown Junior " and " Baby Cyclone " engines were subsequently produced in large numbers and remained among the best model aero engines produced before the war. Nowadays, however, these capacities would be



Scale free-flight power models are popular. This model of a Cessna " 170 " has a ½ c.c. diesel motor and spans 36 in. It is available in kit form.

A modern semi-scale control-line stunt model. This machine, which was built from a kit, is powered by a 3.5 c.c. engine.

considered quite large and we have engines as small as ¼ c.c.

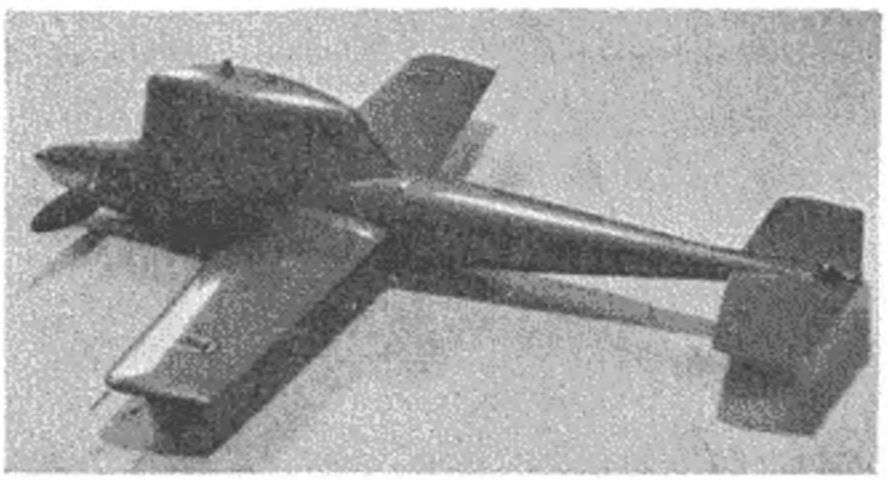
Since World War II, the popularity of the power model has increased tremendously. In Europe, this has been mainly due to the introduction of the model compression-ignition, or diesel, engine, which requires no separate electrical ignition system and can be made extremely light, compact and simple to operate, with the result that relatively small, cheap, easily-built models have brought power-modelling to a vastly greater number of aeromodellers than hitherto. A parallel development in America has been the glow plug engine which, again, does not require the ignition-coil condenser, batteries and contact-breaker assembly of the normal petrol-engine, and this has resulted in tiny engines as light as 1 oz. becoming available. Hundreds of thousands

The modern power duration contest model has been brought to a very high peak of efficiency, and certainly tests the builder's ingenuity in obtaining a long flight from a short engine run.

of diesel and glow plug engines have been sold during recent years in Britain and America.

Another development contributing greatly to the popularity of the model aero engine, was the advent of the C/L model. These models, which first began appearing in the United States in the early 1940's, differ from normal free-flying types in that they are captively controlled from the ground by two thin steel wires which, by means of a suitable linkage, are arranged to actuate the elevators.

In design, C/L models differ considerably from all other power models, since they are not required to possess the free-flight model's automatic stability, and true-to-scale models of full size aircraft are particularly well adapted to this form of flying. Alternatively, design may be altered to produce a



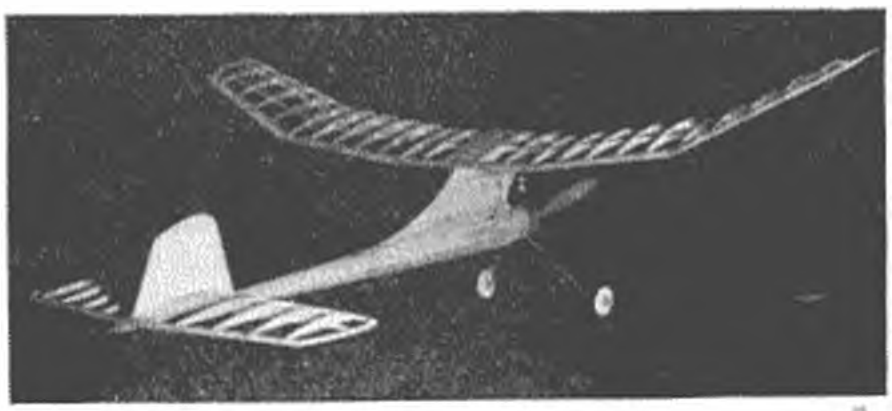
A control-line speed model. Of only 16 in. span but fitted with a ½-horsepower 5 c.c. engine, it has a speed of 100 m.p.h.

"stunt" model, capable of intricate aerobatics, or a "speed" model, designed simply to achieve the highest possible speed in level flight, or a "team-racer" designed for racing against other models over distances of 5 or 10 miles.

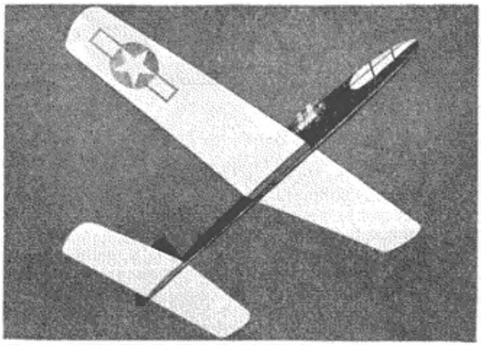
All control-liners are much more powerful, relative to their size, than free-flight types. Free-flight models seldom exceed a flying speed of 25 m.p.h. C/L models usually fly at between two and three times this speed. Scale models and fully aerobatic types, for example, usually fly at between 50 and 70 m.p.h. A 10 c.c. class speed model has reached a velocity of more than 160 m.p.h., while team-racer speeds are now approaching 100 m.p.h. using 5 c.c. engines. The highest officially-recorded speed so far reached with a C/L model is some 179 m.p.h., using a miniature pulse-jet engine similar to that employed in the wartime German V1 missiles.

The swing from rubber to power has also brought with it popularity for the "duration" type competition power model. These machines, which may be considered logical successors to the rubber-driven model of the thirties, are designed to climb as fast as possible, since the rules allow only 20 sec., or less, engine run. The rest of the flight is made up by gliding time and a good power-duration model will stay aloft for 4-5 min. on the 20 sec. allowed. To do this, the model must climb to 500 ft. or more and then settle into a flat, slow glide when the engine is cut out.

A popular size power-duration model is the new 'International" class which limits engine capacity to 2.5 c.c. A typical machine to these specifications



Another typical power-duration model before covering. One of the most popular contest types, these models are capable of very high rates of climb.



Here is a simple all-sheet semi-scale model resembling a typical modern jet fighter, and propelled by a Jetex rocket unit held in a clip on the top of the fuselage.

will span about 50 in. and have an all-up weight of 18 oz. Such a design is invariably of the "pylon" layout to give added stability under power—that is to say, the wing is carried well above the fuselage on a pylon type mounting.

A propulsion system that bridges the gap between rubber and the i.c. engine and is suitable for very small models, is the "Jetex" unit, which was introduced in 1948 and is available in various sizes. This is a jet-type gas propulsion unit which burns a small solid fuel pellet and is safe, quiet and efficient. It is especially suited to free-flight scale models of modern fighter aircraft.

During the past few years, there has also been a wide increase in the popularity of competition gliders. Highly developed in Continental Europe, these gliders are towline launched and the Scandinavian A/2 or "Nordic" class model, now accepted as the official International competition type, has shown itself capable of clocking 3½-4 min. from a regulation 100-metre towline. Nordics usually span 60-70 in. and must weigh 14½ oz. Enjoying a more limited popularity—limited because of the difficulties of transporting such large models—is a large type of glider of British origin. These models span around 10 ft. and have a beautifully graceful, steady flight which is hard to match with smaller machines.

Gliders are very popular among contest fliers, and examples such as this 10-foot model have a slow and graceful flight that is fascinating to watch.

Apart from big gliders, the largest model aircraft usually seen are the bigger types of radio-controlled models. R/C models have a somewhat higher wing-loading than normal free-flight types, due to the extra weight of the radio receiver, batteries and control system which they must carry, and are, therefore, better suited to the larger sizes. Most R/C models are controlled by rudder movements only and, properly understood, this single control is enough to enable various manoeuvres, including loops, to be executed as well as normal left and right turns.

The radio equipment used in these models, together with suitable transmitters, is available commercially and is tuned to the special frequency which has been allocated by the G.P.O. for just such model use and does not require the operator to possess a transmitting licence.

Regarded by many as the ultimate in model flying, the radio-controlled model, usually about 6 ft. in span, is an impressive sight in the air.

To sum up, then, the intending aeromodeller has a wide range of types from which to choose. Roughly, there are a dozen distinct types: gliders, rubber, Jetex, power-duration, scale-power and general-purpose power models, all coming under the general heading of free-flight, with stunt, speed, scale, team-racing and jet coming under C/L and, finally, R/C.

In next month's and the following articles, we shall be giving suggestions for making a start in aeromodelling, followed by some information on building technique, how basic constructional methods are modified for various types, and so on, plus notes on trimming and flying.

HOW IT WORKS

Compared with a normal aeroplane a helicopter is, at first sight, relatively inefficient. A conventional aeroplane derives its lift from forward motion and the amount of weight which can be carried or lifted is considerably greater than the amount of power or thrust needed to produce that forward flight. For example, in a 4 oz. model, just 1 oz. of thrust may produce 5 oz. of "lift." In other words, since there is more "lift" force generated than weight, 1 oz. of thrust will climb the model quite satisfactorily.

A comparable helicopter model might weigh 3 oz., since one can effect a certain saving in weight by eliminating the wings. But to climb the helicopter model at a similar rate (i.e., develop 4 oz. of lift) the rotor or rotors will have to generate 4 oz. of thrust—four times the thrust needed from the propeller of the orthodox model.

However, this applies only to vertical ascent. If there is a side wind blowing across the path of the rotor or the rotor disc, as it is called, there will be a definite increase in lift for the same rotor speed. In other words, a helicopter, model or full size, will climb much better if it is operating in a cross wind, such as would be achieved by ascending at an angle and not truly vertical. Note that a steady wind blowing as the model is launched will not have the same effect. The model will drift with the speed of that wind. But if the wind is gusty this increased lift effect may be noticed.

However, even though a forward velocity, as well as an upward velocity, may help a helicopter, it also introduces a problem of stability. Normally, in still air, both rotors have the same airspeed and therefore the same lift. If, however, there is a cross airstream, the rotor advancing into this wind will have a greater airspeed and the rotor retreating "downwind" will have a decreased airspeed. The effect is to increase the lift on one side of the rotor and decrease it on the other, setting up an unbalance which will tend to roll the whole machine to one side.

In full size practice this is compensated in a most ingenious manner. The rotors are hinged so that they are free to flap up and down. If lift increases on one rotor blade, the blade flaps up and in so doing decreases its angle of attack and also its lift. The opposite rotor with a decreasing airspeed does just the opposite. That flaps down, increases its angle of attack and its lift. The result is that the lift is equalised on both sides of the rotor disc.

A rotor freely hinged at the hub will not fold up completely when it starts to rotate and generate a lift force. There is another force present which will tend to hold the blades out straight and find a point of equilibrium with the lift. This is centrifugal force. The resulting angle at which the flapping rotor finds its equilibrium is called the coning angle.

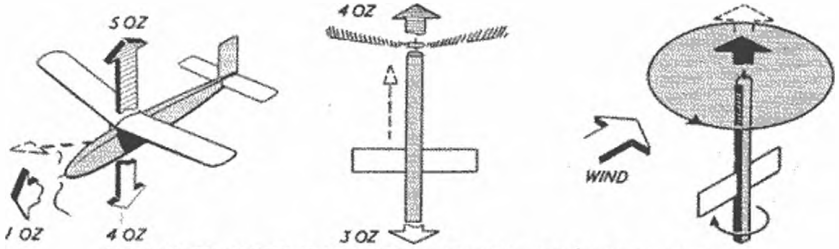
To get forward flight with a helicopter, incidentally, the whole rotor disc is tilted forwards so that the resulting lift force is also inclined forward of the vertical. Similarly for backwards or sideways flight the rotor axis is tilted in the desired direction. When the rotor axis is truly vertical the helicopter will either hover, ascend or descend in a vertical direction depending on the amount of lift generated.

Now all these features are very important in the design of model helicopters. They, too, can be made to fly with the rotor axis vertical or tilted. The latter flight attitude will give more lift and thus a somewhat better rate of climb. However, with models there are a lot of instability troubles which may be encountered. In the full size field most of these stability troubles have been ironed out, although most machines do still require full control by the pilot all the time. Few full size helicopters, in other words, will fly "hands off."

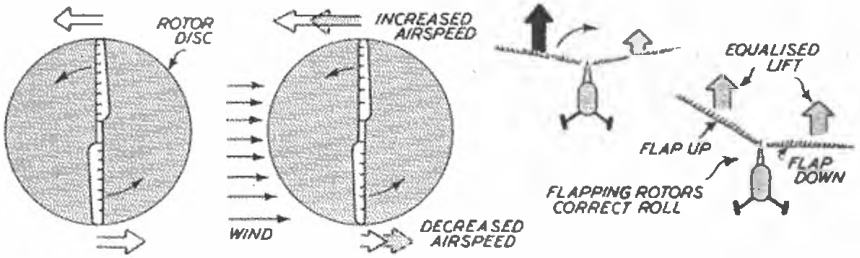
One of the main troubles with model helicopters is that if the rotor axis is fixed (i.e., fixed rotor blades, like a propeller), if that axis is tilted or displaced in flight, such as by a gust, a reaction is set up tending to *increase* the amount of tilt. Some air disturbance displaces the model from its normal flight path and the effect is immediately to make things worse. This is a big argument in favour of flapping rotors on models, which should be self-correcting. The most stable model helicopters yet produced—the "Jetlcopters"—rely for their success on a flapping rotor system. By slanting the hinge the design automatically decreases the angle of incidence of the rotors as they flap up—which is not only a normal stabilising factor but makes it possible for the rotors to continue to autorotate when the power runs out and continue to develop lift for a safe descent.

The other major problem is torque. If only one rotor is used, then as the rotor revolves in one direction, whatever that rotor is attached to will tend to revolve in the other direction, unless the rotor drive unit is itself torque free. This is wasted power. One way of getting round this difficulty, with a rubber model, is to use a rotor at each end of the fuselage—a system which works very well in small sizes. For larger models, however, a more popular method is to fit large fins on the fuselage to act as an airbrake and minimise the loss of power by slowing down the rate of rotation of the fuselage.

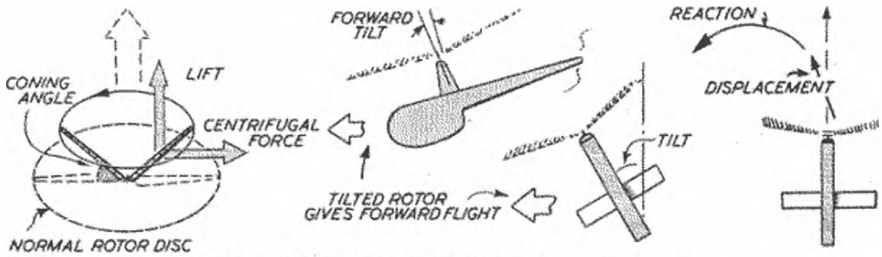
This works very well, provided the side areas are correctly positioned. If the fins are located at the bottom of the fuselage so that the centre of pressure is well below the centre of gravity we have, in effect, a drastically under-elevated aeroplane layout. It may be stable whilst there is sufficient rotor lift to maintain a fair rate of climb, but as soon as the model slows it will tend to turn over and dive. Normally such a layout requires that the fins be located approximately at the centre of the fuselage to balance out the c.p. and c.g. positions.



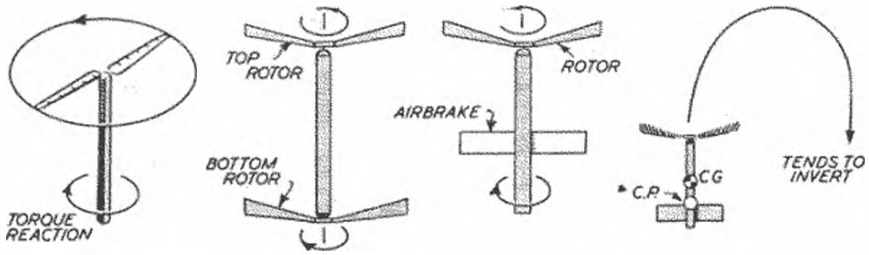
HELICOPTER "LIFT" IS LESS EFFICIENT THAN AEROPLANE "LIFT."



ANY FORWARD VELOCITY UPSETS STABILITY OF FIXED ROTOR SYSTEM.



FORWARD FLIGHT IS POSSIBLE BY TILTING ROTOR AXIS.



TORQUE AND BALANCE CAN ALSO UPSET TRIM OF MODEL.

Don Hewitt starting up his original Frog "150" powered "Pogostick" for a flight in the Astral contest at Fairlop on April 20th.

MODEL Talk

By BILL DEAN

● THE SUGGESTION in the April issue for a midget team racer class (0.5 c.c. max. capacity, 35 sq. in. min. wing area and 7.5 c.c. tank size) brought in plenty of approving letters, which included such typical comments as the following from P. J. Lewis (R.A.F. College, Cranwell) who wrote: "Such a class would be just the thing for beginners who are anxious to get into team racing but are more than a little overawed by the larger 'A' and 'B' models and the more powerful motors."

The small team racer illustrated on this page is powered by the E.D. .46; wing area is 36 sq. in. and the weight 4½ oz. Construction is ultra simple and features ⅛ in. sheet wings and 3/32 in. sheet tail surfaces. The fuselage is oval in section (crutch, former and stringer type) and the cowl is built up from several pieces of thick sheet. To eliminate the usual tedious control installation, the bellcrank is mounted under the port wing panel (close to the fuselage)—and linked to a single elevator on the same side. The pushrod is bent so that it lies flush with the fuselage side when the bellcrank is at neutral and the general installation is almost as neat as the internally mounted type—with none of the attendant difficulties of threading the pushrod through formers and cutting away large chunks of the fuselage structure to allow adequate bellcrank movement.

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● THANKS TO F/Lt. A. F. Davidson, D.F.C., for sending us a copy of the 1952 R.A.F.M.A.A. Handbook, from which we learn that the next R.A.F. Championships will be held at Newton, Nottingham, on September 6th and 7th. This year it is expected that as a result of the rapid expansion of the Association, more than 300 Service modellers from all the Commands will take part in the finals after competing in the eliminators.

Other points gleaned from the Handbook are that the Association was formed in October, 1949 . . . membership is confined to all serving members of the R.A.F. and W.R.A.F.—members of the R.A.F.V.R. and the A.T.C. *not* being eligible . . . 45 different model types have been classified for R.A.F. record purposes and the first three records to be claimed are: Wakefield (3 min. 46 sec.); towline glider (37 min. 46 sec.) and Class "A" F/F (1 min. 52 sec.).

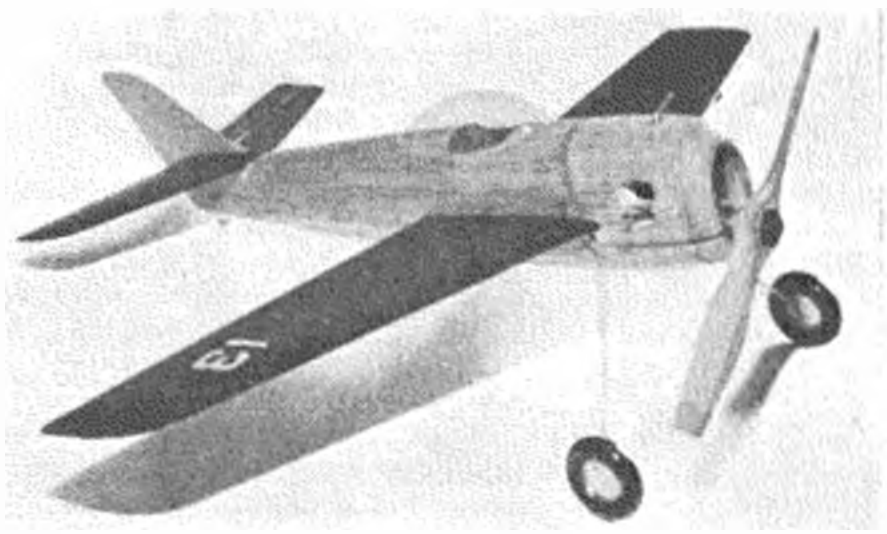
Other R.A.F.M.A.A. news is that F/Lt. Jim Hudson has arranged for the loan of a cine-camera this year, to obtain a complete record of the Championships—the idea being to hire out the film to R.A.F. stations during the winter months to raise funds for the Association.

★ ★ ★

● A FAVOURITE pastime of American magazine editors has long been that of listing the "Top Ten" in various fields of endeavour. *Air Trails* decided to get into the act the other month by polling 300 of the country's foremost contest fliers, model designers and club presidents to determine who were the "Top Ten American Modellers." After the votes had been totted up, the following names (in alphabetical order) headed the list.

Henry Cole (who started the "long Wakefield" trend), *Dennis Davis* (of San de Hogan fame), *Frank Ehling* (one of America's most prolific designers), *Dick Everett* (an all-rounder whose top interest is gliders), *Carl Goldberg* (designer of the first pylon F/F), *Walt Good* (five times Nats. R/C winner), *Dick Korda* ('39 Wakefield winner), *Lew Mahieu* (who once held all the A.M.A. speed records at once), *Jim Walker* (Ole' man U-Control himself) and *Frank Zaic* (famous for his pre-war Year Books and present day Jasco kits).

One of these days, we should like to see a similar poll carried out by MODEL AIRCRAFT, to find out the leading British modellers. But perhaps, on second thoughts, we shall all be much happier (with the exception of "the ten") if we never know the answer to that one!



This small team racer, referred to on this page, is powered by an E.D. .46 diesel engine

● BERT JUDGE sends in an addition to his notes about the new *Jetmaster* unit, which were included in the June "Model Talk." Apparently the credit for working out the necessary data on which the original augmenter tubes were based, should have been given to N. K. Walker, of the "Low Speed Research Association."

In his letter, Bert—who won the Wakefield in '36—went on to tell us that he would have liked to have had a shot at this year's Blue Riband contest, but was unable to get any models ready in time, being too busy settling into his new home near the Wilmot Mansour factory. Before joining "Jetex" some time ago, Bert had been with I.M.A. for fifteen years, the last five of which were mainly spent on the design and development of the "Frog" range of motors—a job which covered the drafting work and making and testing of all the prototypes. He is now engaged on a new series of kit models, the first of which is a 20 in. span replica of the *Saunders Roe SR/A1* jet flying boat. No less than four models were built before the design was finalised and in the end it was found necessary to fit a pendulum rudder to counteract any tendency to swing to either side, due to the uneven thrust caused by the two "50" motors in the event of the fuses not being ignited simultaneously.

★ ★ ★

● LAST MONTH, the Chelmsford Society of Model Engineers and the Chelmsford M.A.C. held their annual four-day "Engineering in Miniature Exhibition." We were invited to go along and judge the model aircraft section (some 60 entries) and as a result had the privilege of inspecting at close range some finely made models by members of the Chelmsford and other East Anglia Clubs. Best model of the show was undoubtedly Chelmsford club member E. Mead's *Super Cyclone* powered R/C entry—an opinion apparently shared by the judges at the 1950 *Model Engineer* Exhibition, where it was awarded first place in its class.

First in the power class went to the model mentioned above and top model in the rubber and glider class was one of the best Fillon *Champions* we have yet seen, built by R. M. King (Chelmsford).

What at first looked like a couple of large "solids" of the *Spitfire XIV* and the *Thunderbolt*, turned out on closer inspection to be rubber powered r.t.p. models by E. P. Edwards (Chelmsford). P. Wise entered an attractive C/L *R.E.8*, powered with a Mills .75 and decked out in No. 12 Squadron markings. Another well built old-timer was a C/L *Sopwith Pup* by K. J. Dean (Brentwood). A Jetex 200 *Vampire* by A. J. Longstaffe featured a well detailed cockpit interior, plus a sliding canopy. G. Foden (Chelmsford) entered one of his distinctive low wing Wakefields, complete with twin *Jaguar*-type blisters.

Frequent flying demonstrations were provided by R. M. King's round-the-pole *Airspeed Ambassador*. Built to a scale of 1/28, spanning 47½ in. and weighing 1¾ lb., this up-to-the-minute project is powered by two 24 volt 1 amp electric motors (surplus R.A.F. blower type)—which each deliver about 3½ oz. static thrust, when driving scale diameter four-bladed props. The tricycle undercarriage is fully retractable and the rather small wing area has been extended at the trailing edge with strips of celluloid to provide just that extra amount of lift needed to get the model clear of the deck.

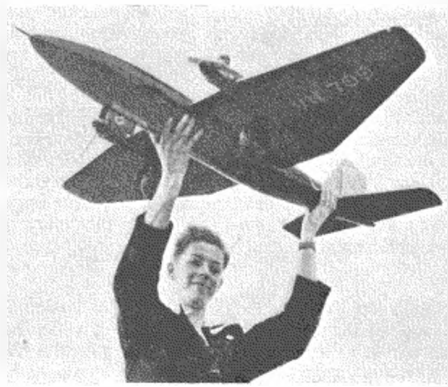
* * *

In Brief

Look out Canada! Ted Martin has teamed up with Cyril Shaw in Toronto, to get the old flag flying in Maple Leaf T.R. circles. Seems like the streets are really paved with gold out there. Ted already has an *M.G. Sports* and Cyril is now the proud owner of a *Sunbeam Talbot* 90 . . . "How long do you reckon it takes to build a Queen's Cup model to the new specifications?" we asked R.H.W. recently. "Fifteen hours," came the reply, "that is, if you use a saw instead of a razor blade!" . . .

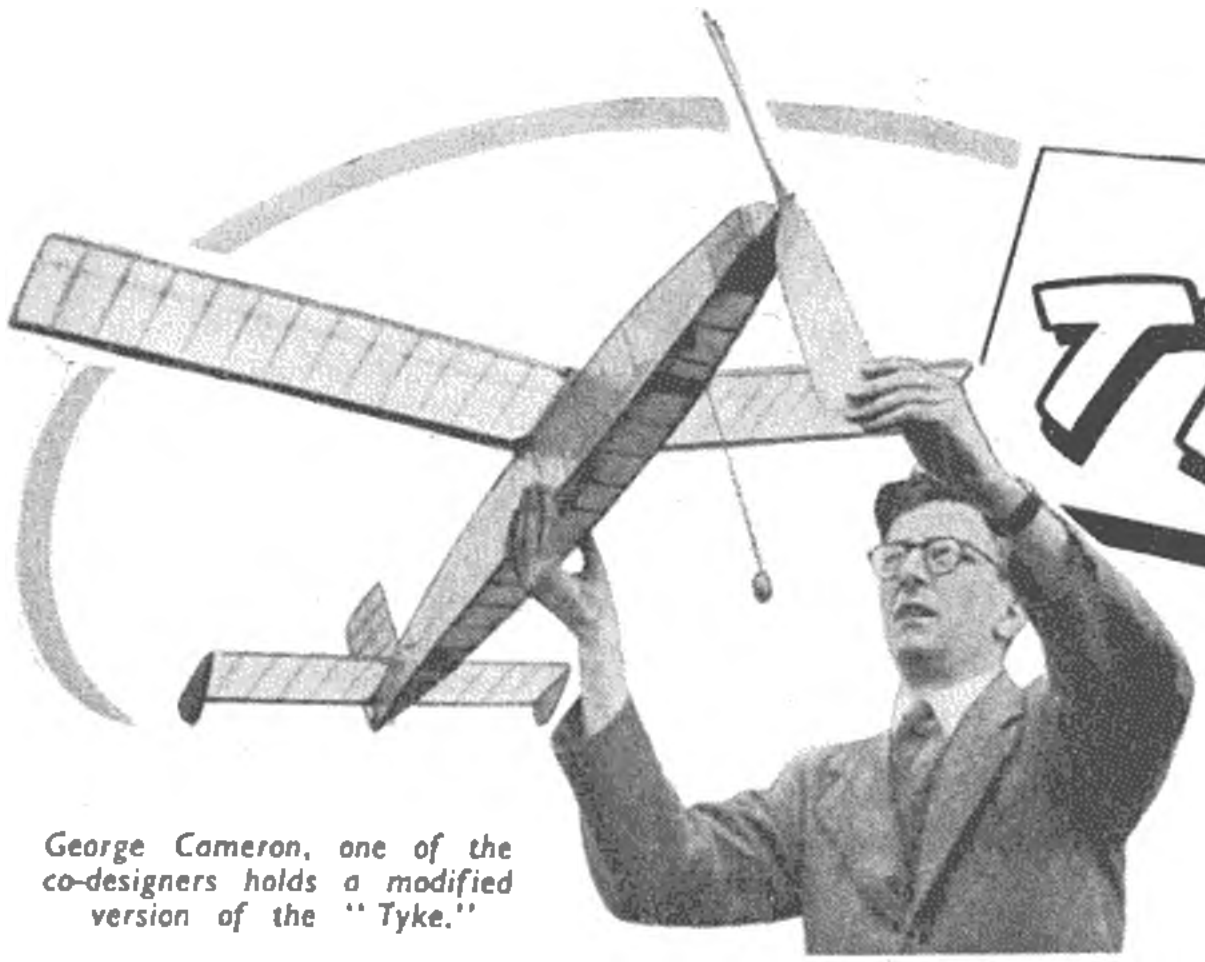
It had to happen sooner or later—someone has built a prop driven *Canberra*! A. W. Major, of the Hornchurch and District club decided that the famous bomber was too good a scale project to pass up, so he went ahead and drew up plans to suit a couple of Frog 500 powerplants. It takes a bit of getting used to, but the model should look fairly realistic in the air. Main specifications are: 53½ in. span (5/72 scale), wing area 4 sq. ft. and weight 5½ lb. The fuselage is planked with ¼ in. sheet, the wings with 1/16 in. and the tail surfaces are cut from ¼ in. sheet.

We knew it must be getting really windy at Fairlop on June 1st (International power trials, pay-load, R/C trophy and scale F/F events) when a youngster started cruising along the runways in his land yacht. Most of the birds were walking and you could tell by the expressions on their faces exactly what they thought of those modellers who were rash enough to fly in any of the contests . . . Bill Winters latest R/C model is powered by a British diesel—the faithful old E.D. Comp. Special . . . We see from a copy of a German model monthly that most well-known British kits and engines are now available there.



A. W. Major and his twin Frog "500" powered E.E. Canberra. This model was scaled up from a 1/72 scale kit drawing.

The TYKE



George Cameron, one of the co-designers holds a modified version of the "Tyke."

Co-designers

G. CAMERON
V. DUBERY
K. RUTTER
H. TUBBS

THIS design was produced by a sub-committee of the Leeds M.F.C., the object being to plan a simple, easy to make and easy to fly Wakefield. The design had to be suitable for juniors who had only made two or three models, and also for the grey-beards who had been model flying since the bamboo and oiled silk days.

Accordingly we made it as simple as possible—just the bare essentials of a Wakefield, in fact—and incorporated a choice of wing sections. There is Clark Y for those who don't like covering under-cambered wings, and R.A.F. 32 for those who do, if any. The rest is plain sailing. Even the propeller is about as simple as it could be; and when you have finished you have got a model to Wakefield rules which will climb high enough to compete with the best in normal daytime conditions.

Performance is really up to the builder, first of all in making the model, and later in trimming it. During construction, keep the weight down by using good quality wood, and only using hard wood where you think it is really necessary. The weight of the whole model, minus rubber, should in no case exceed 4½ oz., and with a little care you should get it below 4 oz.

Fuselage

Build the two sides flat on the plan. Assemble them with the aid of the two formers, using the flat portion on the fuselage top to keep the structure true. Make up the undercarriage box, bind it tightly with thread, and rub cement into the binding. Use ample cement on the gussets which hold the box to the longerons. The undercarriage and wheels are self-explanatory on the plan.

Propeller and Noseblock

Lay out the block from five layers of 18 in. long quarter inch sheet, 1 in. wide, as shown on the plan. It is an advantage to drill each layer before assembly, and then to assemble them on a piece of wire protruding vertically from the building board. The centre hole for the bush is then automatically true.

Leave the block to dry for 24 hours, then carve and sand. Cut away about half the block thickness at the back of the hub to reduce weight and drag there.

Make the noseblock from four layers of ⅛ in. sheet, with a rectangle made up from $\frac{1}{16}$ in. square to fit into the fuselage nose. Ensure that the bush is true, then carve and sand to shape.

Assemble by first bending the front hook, then adding washer, propeller, ball race and noseblock. Bend the bobbin hook last of all.

Wing

Build this on the plan, first one side, then the other and finally assemble on to the centre section. Make good joints around the dihedral braces and add the fairing after covering.

Tail and Fin

No special instructions are necessary except that the fin base must be a good tight fit in the slot between the tail centre-ribs.

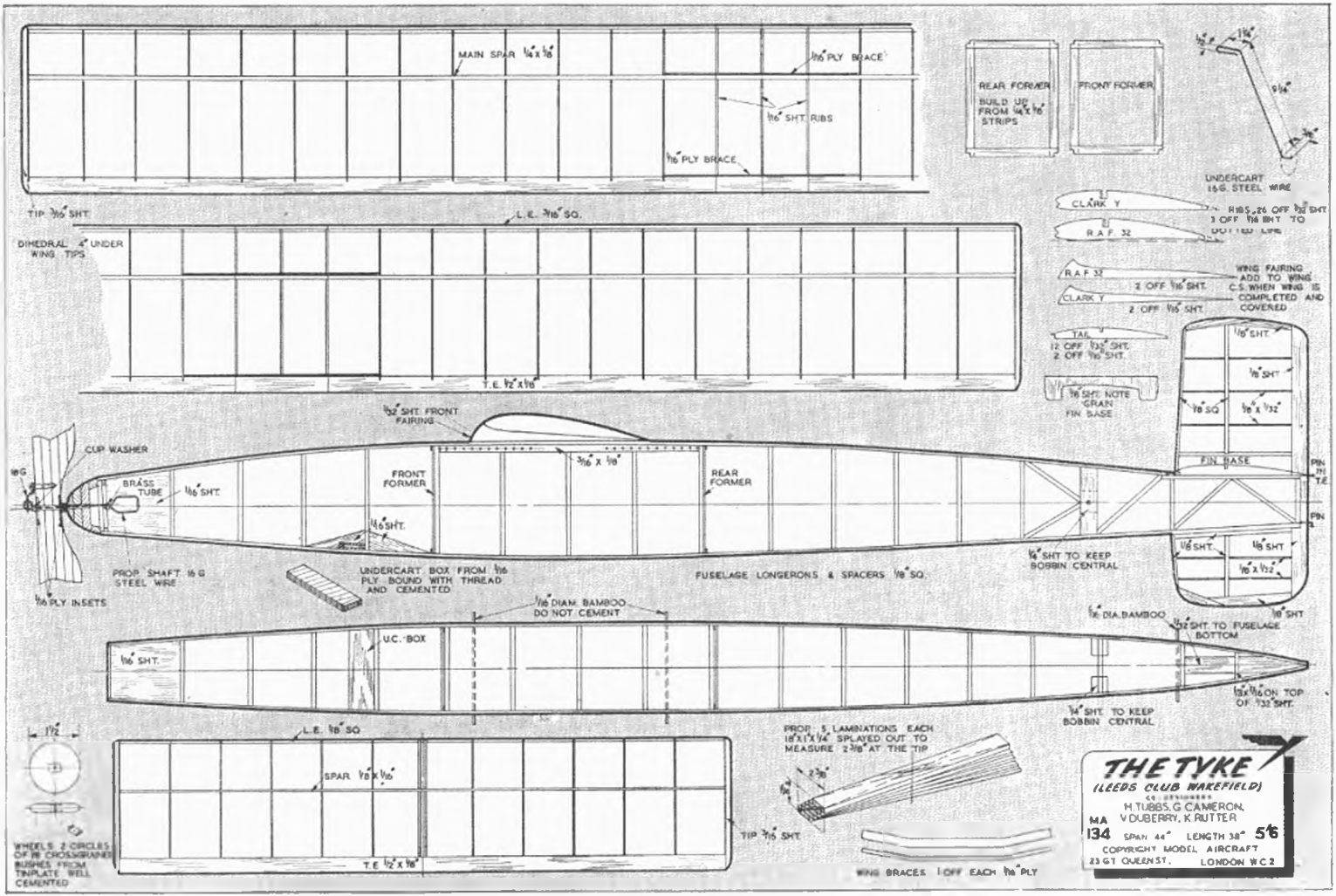
Cover the model with lightweight modelspan and give one coat of clear dope. Use no coloured dope except on the noseblock if desired. It is preferable from the timekeepers' viewpoint to make the fuselage a dark colour.

Motor

This is sixteen strands of Dunlop or Pirelli ¼ in. × 1/24 in. rubber. The length will depend on the airframe weight—use enough to bring the total weight of the model to 8¼ oz. As a rough guide about 180 in. of Dunlop rubber strip weighs 1oz., Pirelli is slightly heavier.

Lubricate the motor with castor oil or glycerine and tension it by splitting it into two halves of eight strands each and winding about 70 to 80 turns in the normal direction on to each half. For flying, the motor should take about 15 tons per inch of its

(*Continued on page* 383)



FULL SIZE WORKING DRAWINGS ARE OBTAINABLE FROM YOUR LOCAL DEALER, OR BY POST FROM THE "MODEL AIRCRAFT" PLANS DEPARTMENT, 23, GREAT QUEEN STREET, LONDON, W.C.2, 5s. 6d., POST FREE.

MODEL AIRCRAFT

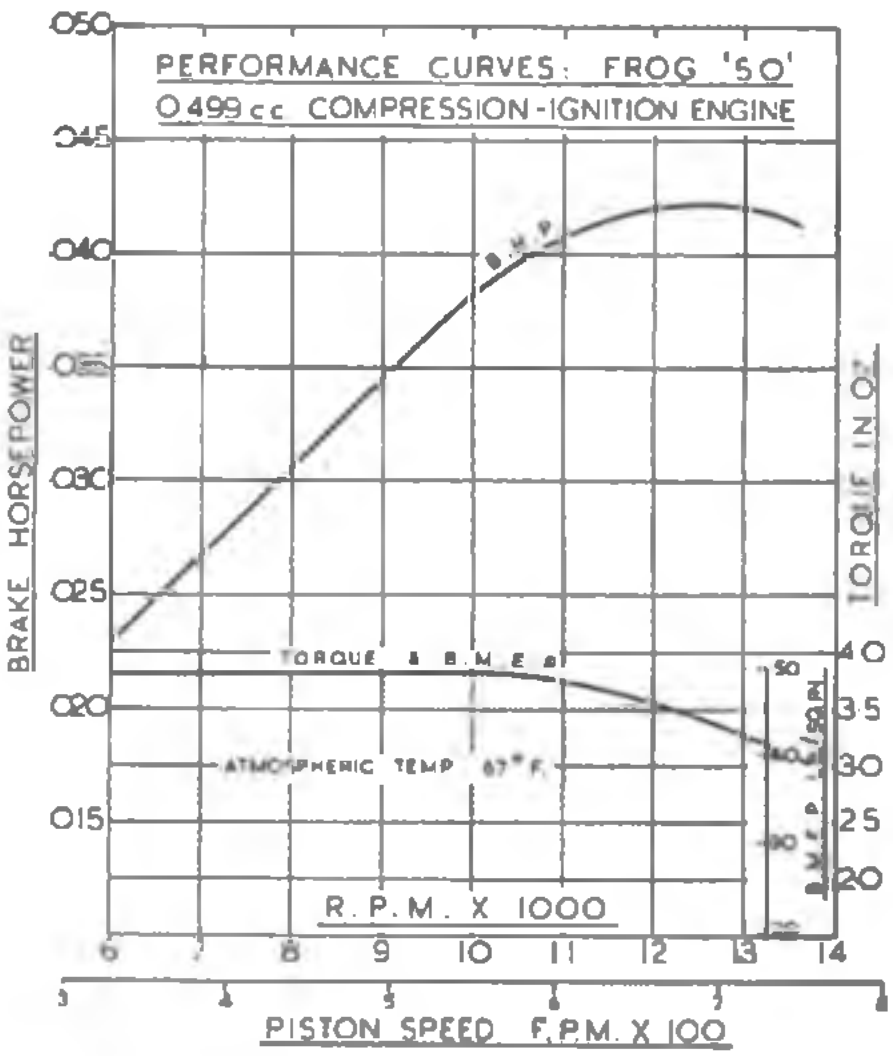
ENGINE TESTS

No. 38. The FROG "50"

THE most compact and just about the lightest of current ½ c.c. engines is the new Frog "50." It is also the lowest-priced; which price, however, has not been achieved by any sacrifice in quality. The unit is well made, both in respect of the quality of the die-casting and machining.

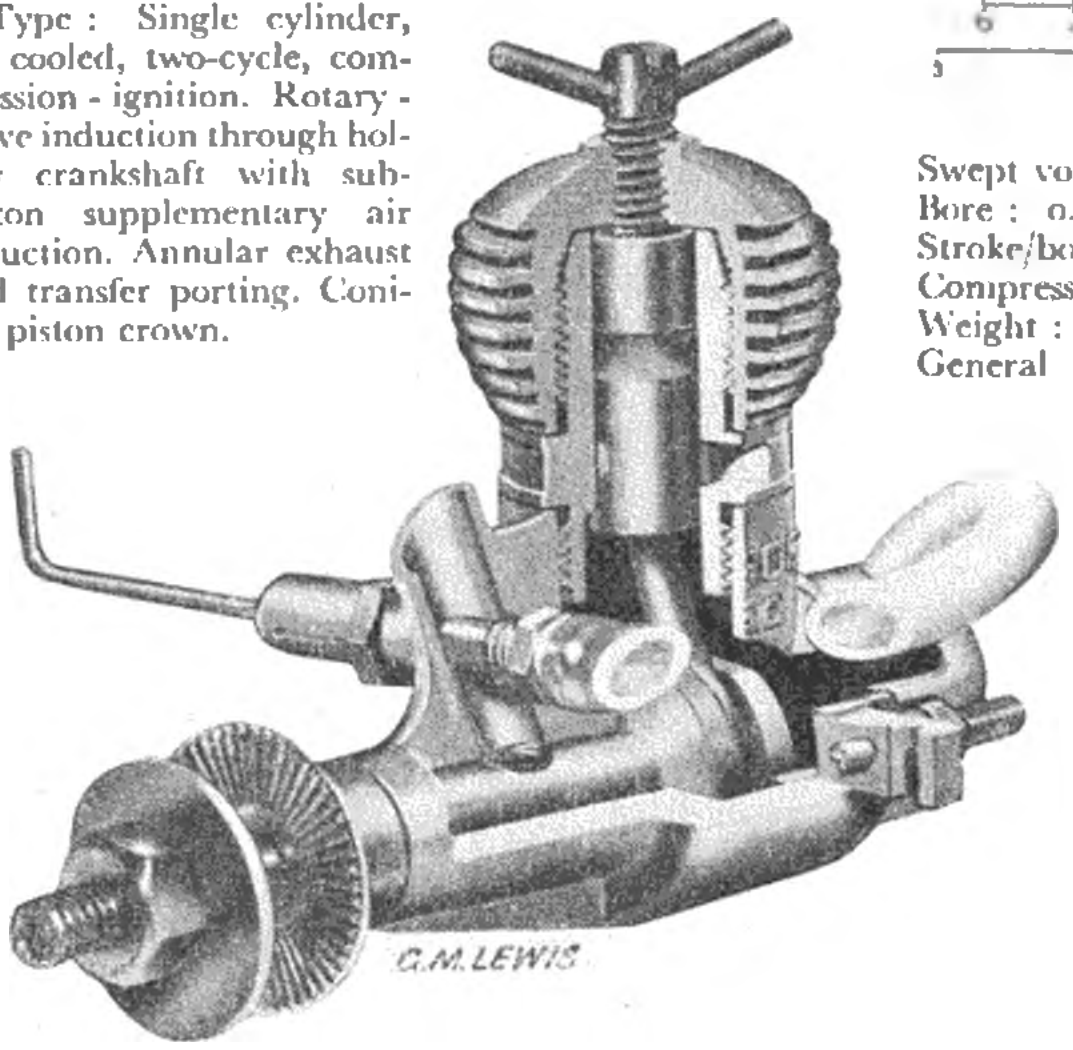
Basically, the "50" is a scaled down version of the "150" model introduced last year and dealt with earlier in this series. The only notable design modification is the use of a slightly higher stroke/bore ratio. Externally, the appearance of the engine differs only in the use of a die-cast metal tank (in place of the transparent plastic one on the "150") and in the vee-type compression lever and slightly deeper cylinder fins.

At the time of writing, Frog "50's" have not yet become generally available at home, the bulk of production being exported, and the co-operation of the manufacturers was, therefore, gladly accepted in the supply of a unit for test purposes. By the time these words appear, "50's" should be a little more plentiful.



Specification

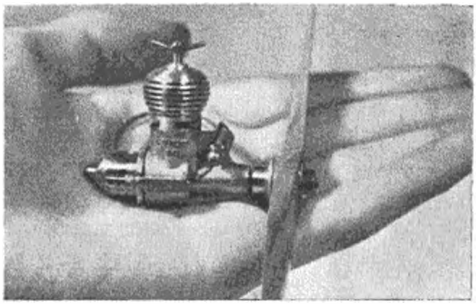
Type: Single cylinder, air cooled, two-cycle, compression-ignition. Rotary-valve induction through hollow crankshaft with sub-piston supplementary air induction. Annular exhaust and transfer porting. Conical piston crown.



Swept volume: 0.499 c.c. (0.0305 cu. in.).
Bore: 0.343 in. Stroke: 0.330 in.
Stroke/bore ratio: 0.962 : 1.
Compression ratio: Variable.
Weight: 1.2 oz. (including tank).
General structural data: Die-cast aluminium alloy crankcase and rear cover. Hardened steel cylinder, ground and honed and threaded into crankcase. Mechanite piston and contra-piston, ground and lapped. Silver-steel gudgeon pin, tight press fit in piston. Forged hiduminium RR.56 connecting-rod. Hardened steel crankshaft, ground and lapped. Spray-bar type needle-valve assembly. Beam or radial mounting. Detachable fuel tank, attached with single screw to crankcase cover and may be rotated for inverted or side-mounted running.

Test Engine Data

Total time logged: 2 hours.



This picture shows the small size of the engine.

Fuel used : Ether (40 per cent.), castor-oil (30 per cent.), kerosene (30 per cent.) plus, 2 per cent. amyl-nitrate.

Performance

In submitting the " 50 " engine for test, the makers stated that a r.p.m. check had shown it to be about 2,000 revs down on the potential performance, and it was suggested that this improvement would be realised after about two hours' running-in. Such an improvement, of course, calls for a very big increase in horsepower as delivered at the shaft and the engine was therefore run-in for the period specified and a check kept on the power being delivered.

After a few preliminary runs to check for any undue tightness, the engine was loaded to produce an even speed of 9,000 r.p.m. At the end of half an hour of intermittent running, an improvement of approximately 16 per cent. b.h.p. was obtained. During the next hour, a further 14 per cent. b.h.p. was registered. No further increase was detected beyond this period.

The engine showed a negligible loss of power when running hot. It was, therefore, given two continuous runs of 15 min. each at 10,000 r.p.m. Power checks were taken at the beginning and end of each run. The engine held even readings throughout each run.

The fuel used throughout the tests, and for running-in, was the mixture given above, which the makers advise for this engine. The use of " etherless " type fuels, such as Frog " Powa-Mix," is not recommended for use with the " 50."

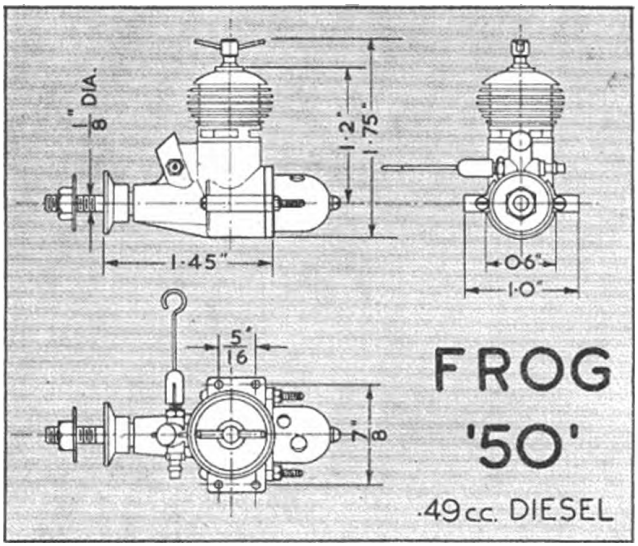
The " 50 " was then run over a speed range of 6,000/13,500 r.p.m. to obtain readings for the torque and b.h.p. curves. At the lower speeds there was some fluctuation and the " 50 " definitely seems to prefer to run at speeds above 8,000 r.p.m., than below this figure. The best torque figure obtained was approximately 3.8 in. oz., which is very good, being equivalent to a b.m.e.p. of nearly 50 lb./sq. in. and this seemed to suggest that a good mechanical efficiency had been achieved following the 2-hour running-in period. It is, of course, just possible that further prolonged running-in may result in a slightly higher figure being realised at the top end of the speed range, accompanied by a higher peak b.h.p. and r.p.m., but the decline of the torque curve is, in fact, at quite a normal rate, while the actual figures of just over 0.042 b.h.p. at around 12,600 r.p.m. is, of course, a very good performance for a 0.5 c.c. unit.

As regards general handling characteristics, we have only one complaint to make and this, in any case, may only apply to the example tested. On the test engine, the contra-piston was unduly tight which not only made adjusting it rather uncomfortable but, more important, complicated the tests by making it impossible to reduce compression once the engine was running. Thus, every re-adjustment to suit load had to be made towards the critical setting by *increasing* compression, and not by backing off from excess compression. If, when running, the engine began to indicate symptoms of being over-compressed for the load, it was necessary to stop the engine, prime and flick to return the contra-piston re-start and re-adjust to a lower setting.

It must be emphasised that this is very unlikely to be a fault common to all " 50's." It is mentioned only because it is the purpose of these tests to report on all such effects encountered. In all other respects the engine behaved perfectly and it was not thought that a request to the makers for a replacement test unit was warranted.

Most very small high-performance diesels tend to be slightly more critical to starting adjustments

(*Continued on page* 381)

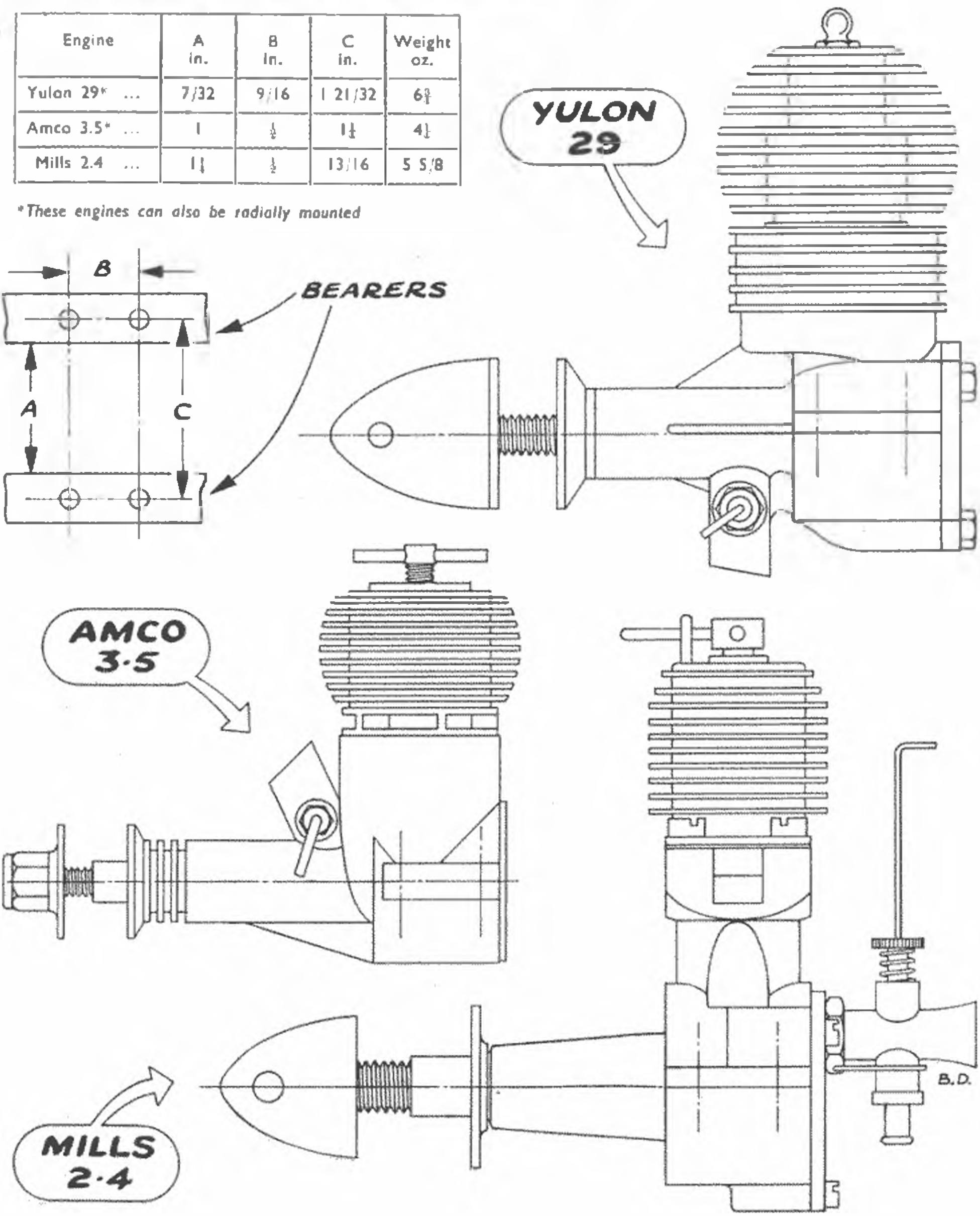


WILL THESE FIT ?

A FURTHER SELECTION OF ENGINE SIDE-VIEW DRAWINGS

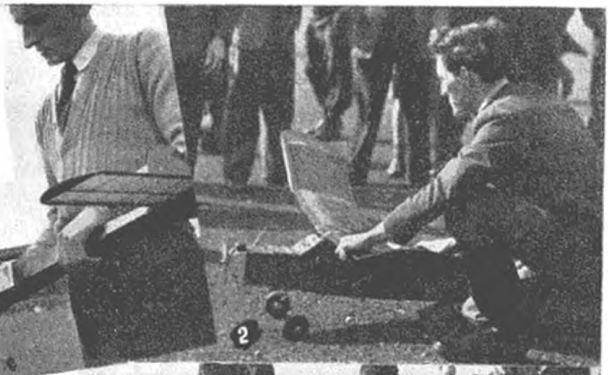
Engine	A in.	B in.	C in.	Weight oz.
Yulon 29* ...	7/32	9/16	1 21/32	6¾
Amco 3.5* ...	1	½	1¼	4¼
Mills 2.4 ...	1¼	½	13/16	5 5/8

**These engines can also be radially mounted*

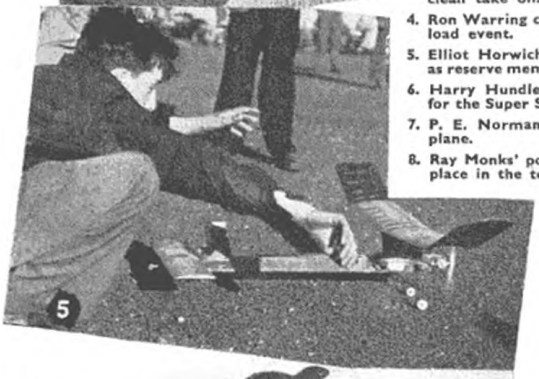


WHIT SUNDAY MEETING at FAIRLOP

- International Power Trials
- Short Cup P.A.A. Payload
- Aeromodeller R/C Trophy
- Super Scale cup. Scale power



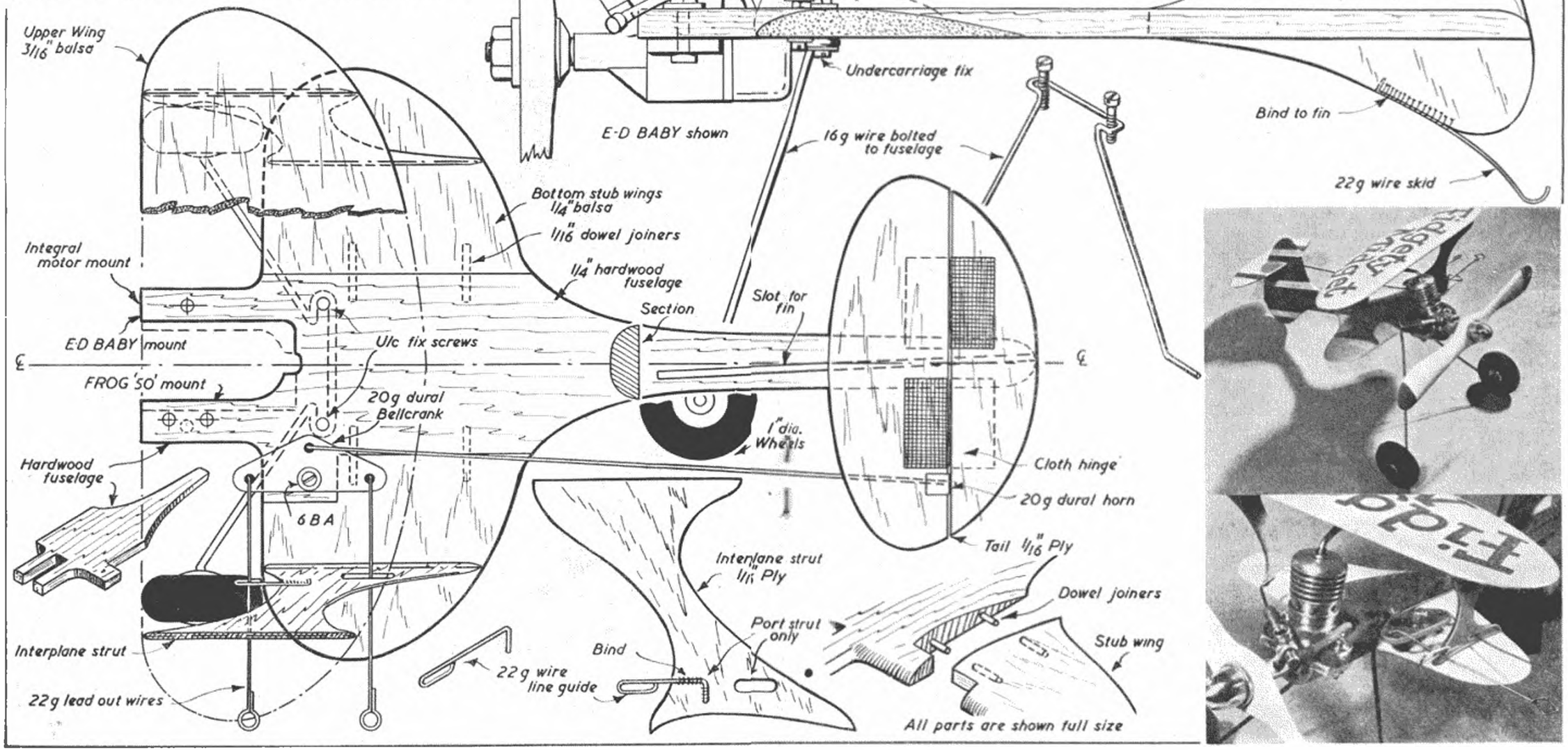
1. Silvio Lanfranchi checking the engine run on his power model.
2. Chas. Taylor making final adjustments to Den Allen's winning R/C entry.
3. Henry Tubbs' power entry makes a clean take off.
4. Ron Warring came second in the payload event.
5. Elliot Horwich (Whitefield) qualified as reserve member of the power team.
6. Harry Hundleby judging the entries for the Super Scale Cup.
7. P. E. Norman with his Fokker Triplane.
8. Ray Monks' power model won him a place in the team.



Fidgety Midget

by GUY RAMAEKER

Here are full-size plans for an amusing little quick-to-build control line model for .5 c.c. motors

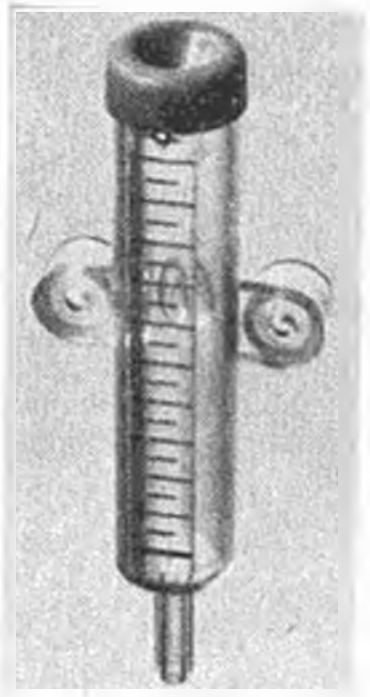


OVER THE COUNTER

Warneford's are back with finished, ready-to-fly rubber models. Their first is called the *Wasp* and is a 16 in. span stick design which sells for 8s. 6d. Older readers will remember that in the early 1930's Warneford ready-made stick models were a great attraction. Of hardwood and wire construction with oiled silk covering, they really flew. Quite a number of present day experts will admit to having been set on the " duration " road with a Warneford.

* * *

A very welcome addition to the accessory line is a new graduated fuel tank produced by The Model Shop (Newcastle). This has been specially designed for baby engines and has a non-removable filler cap (a good point, for this part cannot get lost) ; tapered nozzle to fit any size of fuel tubing ; and stout mounting lugs. Just the sort of accessory, in fact, that contest modellers have been looking for for a long time. Judging by the " bodge jobs " we have seen on the flying field with home-made celluloid tanks, this is not an item that the average modeller likes making himself. Price of the " M.S." tank is 2s. 3d. (including P.T.).



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Messrs. Wilmot Mansour & Co., manufacturers of Jetex motors, are working on a 10 ft. 6 in. span radio controlled glider project for the Ministry of Supply. This work is being carried out jointly with the Low Speed Aerodynamic Research Association. The model was designed by N. K. Walker as a R/C test bed, and construction and flight testing have been in the hands of A. A. Judge who, as we reported earlier, joined Wilmot Mansour recently from International Model Aircraft.

Main object behind this experimental model, it appears, is to test the practicability of radio controlling target gliders to be used for gunnery practice.

* * *

Production of the first of the new Keilkraft 1/72nd scale solid kits has been delayed so that a complete range of ten models can be launched simultaneously.

THE MODEL SHOP
13, BOOTLE STREET, DEANSGATE, MANCHESTER, 2.

Opened in January 1951, by Mr. R. E. Ridyard, the shop is managed by his son Keith, who is seen in the photograph above. Both are keen modellers and members of the Sale M.A.C.

To cope with its expanding business the shop has been extended to double its original size and it is now possible to display the comprehensive range of model aircraft requisites which is stocked.

These will include such modern prototypes as the Vickers *Valiant*, etc.

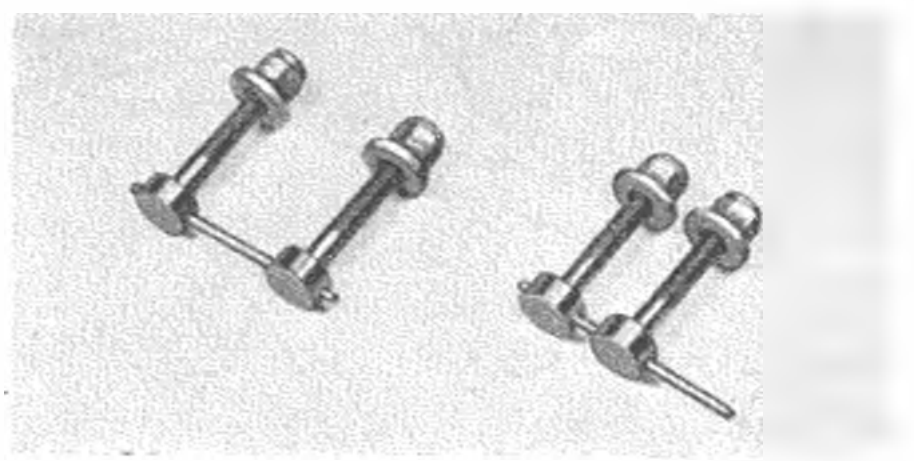
* * *

To any retailers who have not been circulated we take this opportunity of advising them that all *Jetex* products are now distributed direct by the manufacturers. All future trade orders, etc., should therefore be despatched to Wilmot, Mansour & Co. Ltd., Salisbury Road, Totton, Hants.

* * *

We can thoroughly recommend the new M.S. " Lockfast " adjustable hold-down bolts for mounting all sizes of motors up to 5 c.c. These obviate the necessity of soldering the heads of screws to a length of wire under the bearers, or similar methods, to prevent the screws turning as the nuts are tightened.

A pointer here for retailers. We tried in several model shops to purchase a 6 B.A. box spanner. Only one out of six could supply. Now this, we would have thought, was an accessory every retailer ought to have in stock.



OVER THE COUNTER

JETEX "JETMASTER"

TEST REPORT

Twenty-nine and fourpence may at first sight seem a lot of money for a Jetex "100" unit but when you come to examine the new "Jetmaster" in detail you quickly realise that it is quite an intricate piece of mechanism (if such a term can be applied to a power unit with no moving parts). Furthermore, it is designed and manufactured to the very highest standards.

The "Jetmaster" represents a considerable advance over the original "100" unit with its greater thrust and more streamlined appearance. It is not, however, a unit which can be treated with careless abandon. It needs proper maintenance and careful cleaning—both simple and straightforward jobs, but very necessary.

The redesigned clip assembly makes it easier to reload the unit but the space between the jet hole and the charge is now considerably increased. Since the wick is a fairly close fit in the jet hole this does make insertion of the wick a little more tricky. It is imperative, in fact, that the jet be *thoroughly* cleaned after each firing and a special tool is provided for this purpose. On test we found it easier to use a longer length of fuse than that specified so that there was enough to hold the fuse rigid in the fingers and push the end right through the jet before attempting to replace the main end cap. Surplus fuse was then cut off to leave the recommended ¼ in. protruding.

A series of thrust tests were carried out on a simple piece of apparatus made for the job. This is shown in the diagram, together with a graph of the results. The spring used was wound from 30 s.w.g. piano wire, aged by "working" some five hundred times under load and the trolley scale then calibrated with hanging weights. At the end of the tests the calibration of the scale was again checked.

The resulting thrust curves have been smoothed to give a more straightforward picture of comparative results. In all cases the thrust was more nearly constant with the augmenter tube than without.

With the augmenter tube, and using Red Spot fuel, the makers' claimed figure of 2.25 oz. thrust was achieved on all tests. With the augmenter tube and standard "Jetex" fuel, average thrust was almost exactly 2 oz. Thus the Red Spot fuel gave a 20 per cent. increase in thrust over standard.

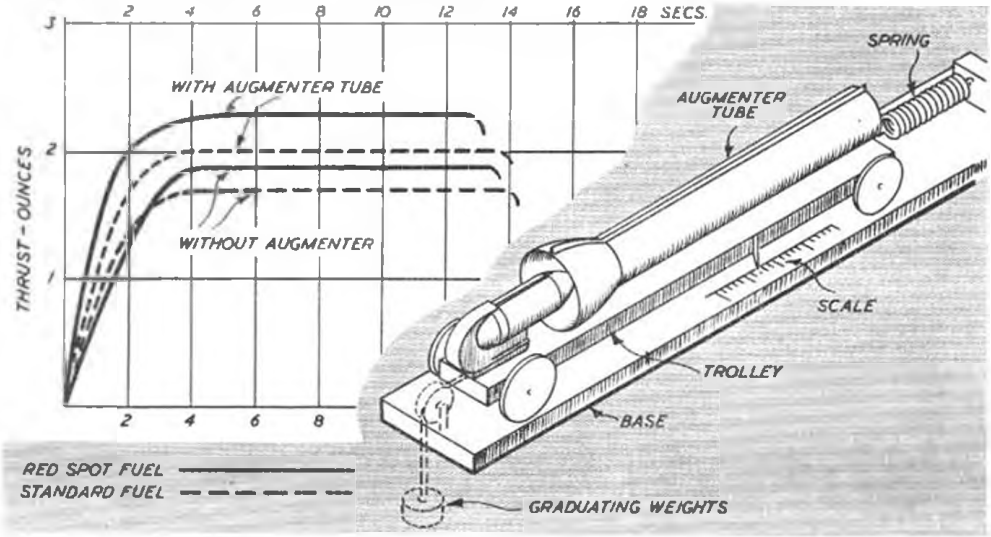
Without the augmenter the increase in thrust was somewhat smaller. An average thrust of approximately 1.85 oz. was obtained with Red Spot fuel as against 1.7 oz. with standard fuel (increase about 9 per cent.) but both figures were above those claimed by the makers.

For lighting the fuse when an augmenter tube is used a wire gadget is employed which grips a cigarette and is passed up the augmenter tube from the rear. This worked quite satisfactorily and was quite easy to use. It is, in fact, about the only practical method of firing the unit when an augmenter tube is fitted.

Although no apparatus was available to check, the Red Spot fuel appeared to burn hotter than standard fuel. Gauzes disintegrated after three firings and the main cap washer needed replacement after every seven or eight firings, on average.

The one criticism we have of the "Jetmaster" unit is the method of mounting. This is most ingenious and, like most other good design features,

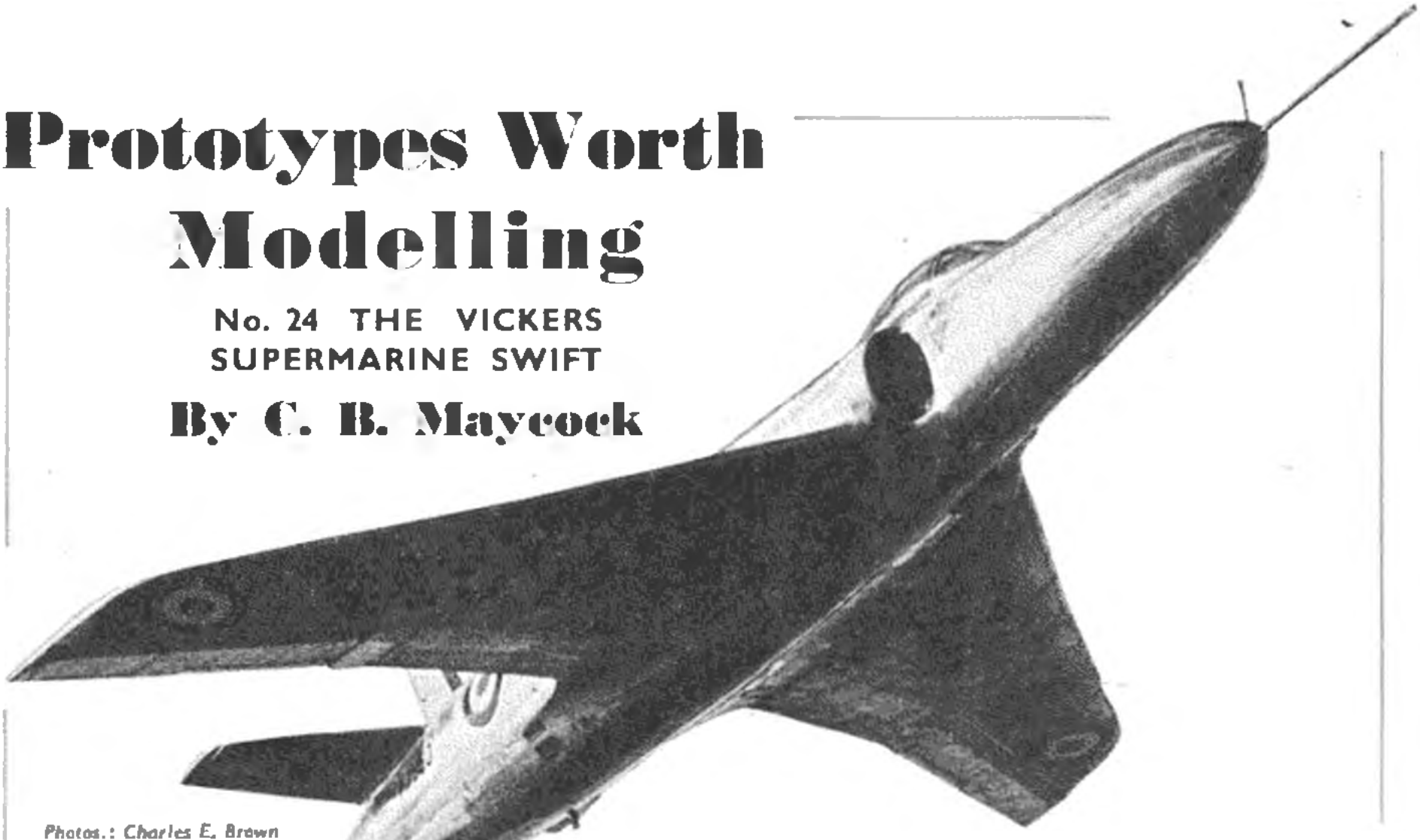
(*Continued on page* 379)



Prototypes Worth Modelling

No. 24 THE VICKERS SUPERMARINE SWIFT

By C. B. Maycock



Photos.: Charles E. Brown

THE Vickers Supermarine *Swift*, fitted with a Rolls Royce "Avon" axial-flow turbine first flew in August, 1951. It was developed from the *Attacker* and has many parts in common with that aircraft.

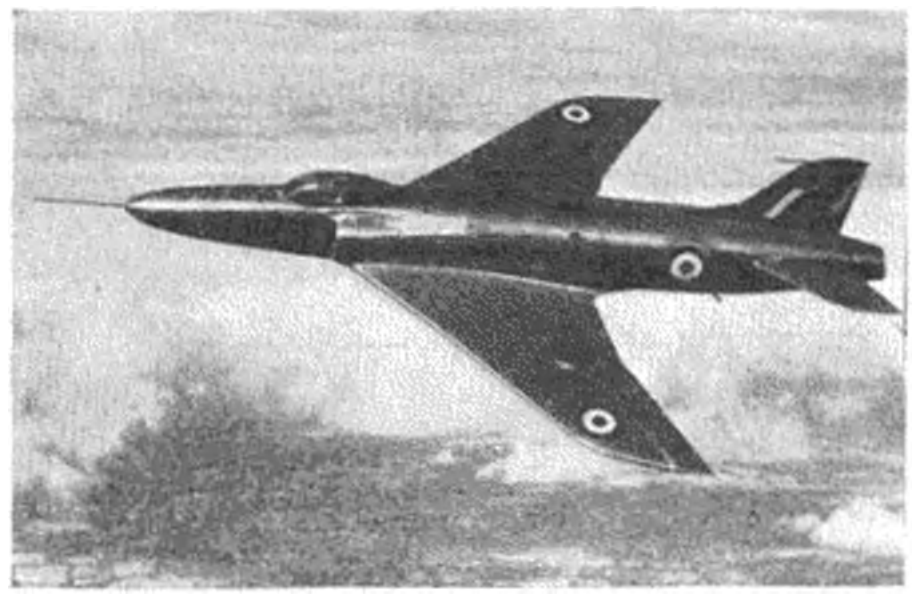
The fuselage is of circular section and, where it joins the mainplanes, consists of three heavy bulkheads, and a half bulkhead under the mainspar connected by the stiffened lower half of the skin. These and the upper half form into a complete drum of great strength. The central main bulkhead carries the pick-up points for the main spar and divides the fuselage into two bays at the centre section. The forward portion contains the divided air intakes and the after portion, the engine bay. The "Avon" runs the full length of the engine bay with the tail pipe protruding through. The housing containing the compressor and combustion chambers is mounted on to the half bulkhead; the thrust and inertia forces are taken up by diagonal struts. The main fuel tanks fit the space between and above the air ducts, while a further saddle tank is over the engine bay.

The mainplanes are sharply swept back and have two spars. There are two special ribs where the outer panels are attached. The front spar is of box section, and the rear spar I-section inside a C-section. The front portion of the fuselage carries the pressurised cabin. Pressure and heat for the cabin are supplied from the engine compressor. The fixed windscreen has double panels each side and at the front. The after part of the canopy slides rearwards on a rail and can be jettisoned when the ejector seat is to be used. In front of the pilot is an armour plate, and there are two curved plates each side. An emergency exit is placed each side in front of the air intakes. They can be opened from outside or inside.

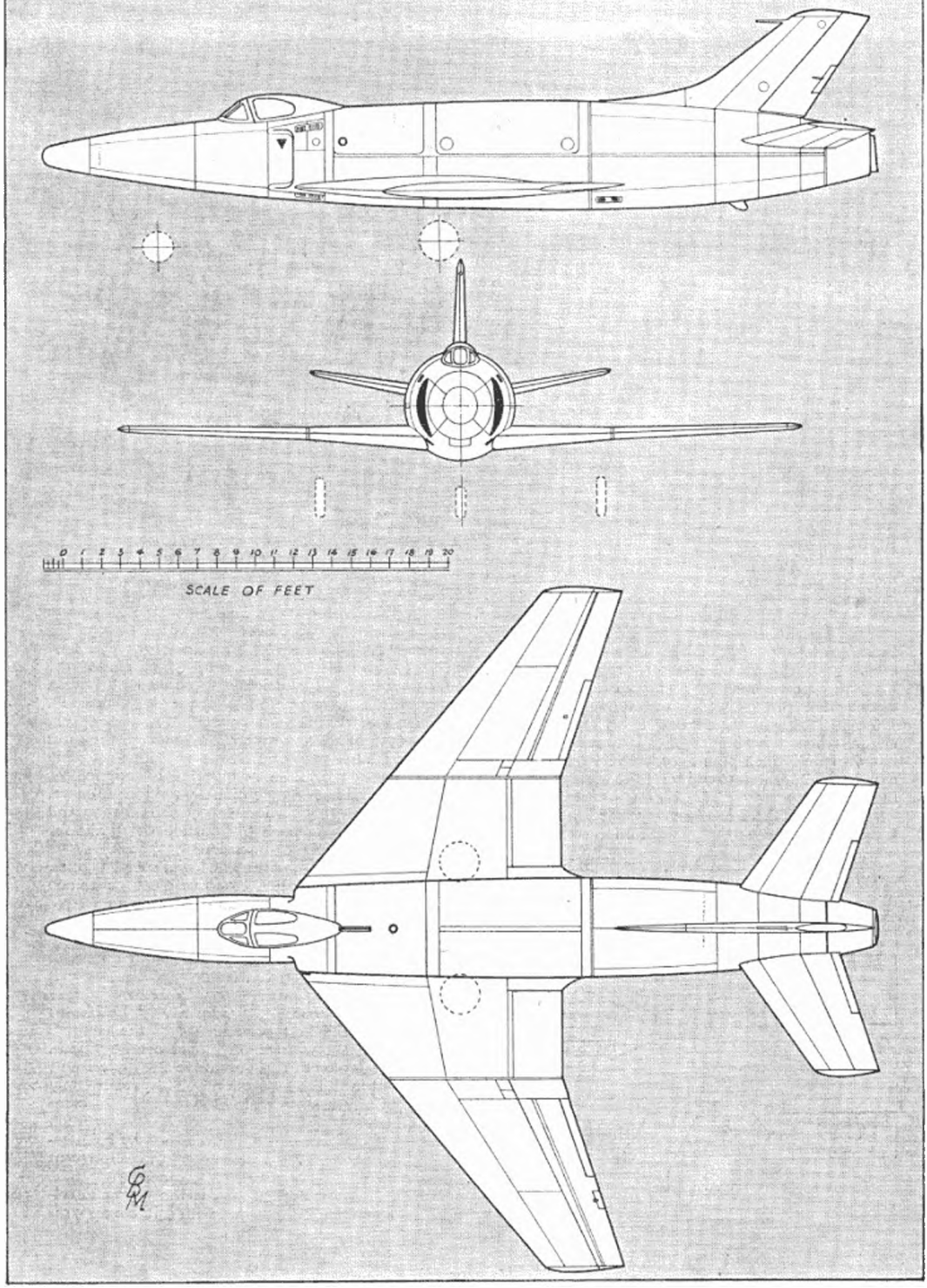
The controls are very similar to those of the piston-engined Vickers-Supermarine *Spiteful*. A gyro gun sight is fitted and the armament probably consists of four 30 mm. cannon with 300 to 400 rounds for each. The VHF radio, beam approach and IFF systems are all housed in the quickly detachable nose.

The colour scheme is highly polished metal all over, plus the usual red, white and blue R.A.F. markings and the lettering in black. The number of the prototype is WJ960, placed each side of the after end of the fuselage in line with the leading edge of the tailplane, and on the undersurfaces only of the mainplanes, fairly large and close to the leading edge. The main dimensions are as follows: span 31 ft. 8 in., length 43 ft. 4 in.

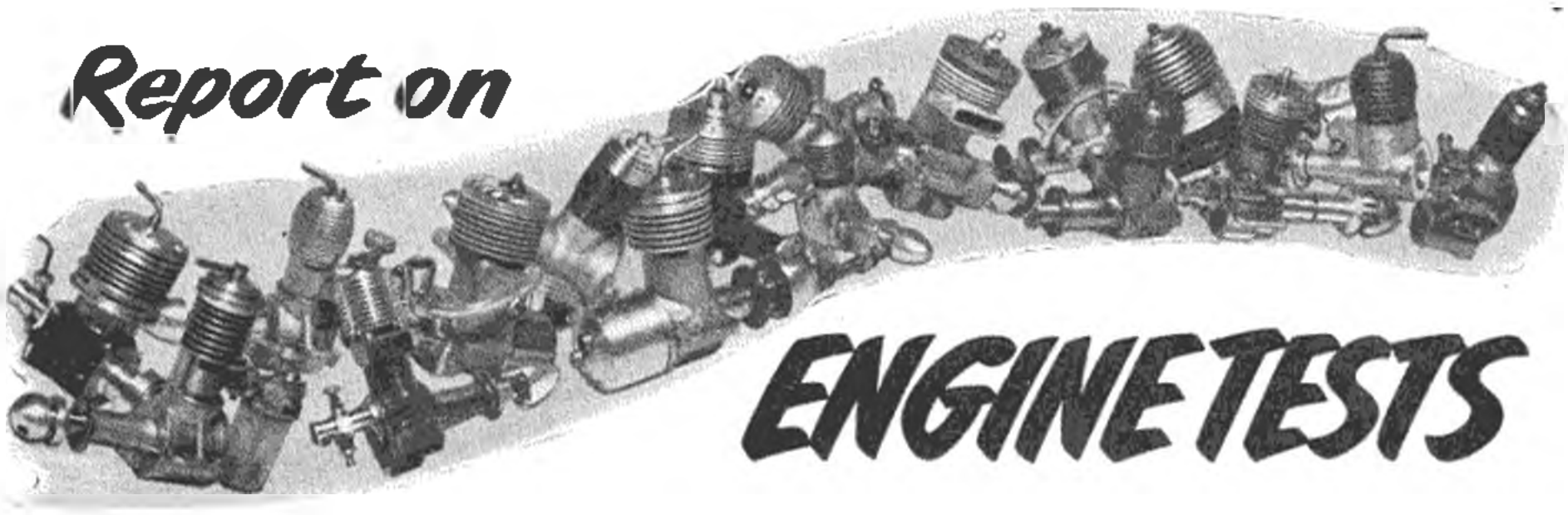
The undercarriage is of the tricycle type, the nosewheel retracting forwards and the mainwheels inwards, aft of the main spar. As announced recently, the *Swift* is the first swept-wing fighter to go into quantity production for the R.A.F.



VICKERS-SUPERMARINE "SWIFT"



Report on ENGINE TESTS



Part II Performance Factors and Design Trends

IN the first part of this article, published last month, we discussed the question of performance variation, as recorded by the "Engine Tests," between apparently identical examples of model engines, and of the factors which influence such variation.

Before going on to analyse the progress which has been made of recent years, it is, perhaps, appropriate to insert at this point, some notes of the meaning of the various units by which the performance of a model engine is measured and recorded for the test reports.

Inevitably, this will repeat certain of the definitions included in the writer's earlier article, "Facts and Findings on Engine Tests," published nearly two years ago in MODEL AIRCRAFT, but this is necessary for the benefit of new readers unacquainted with these terms. Some additional information is, however, now included. The terms are torque, b.h.p., b.m.e.p., power/weight and power/displacement factors and piston-speed.

Torque is simply the turning effort exerted by an engine when it is running and is usually measured in foot-pounds, inch-pounds or, for very small engines where the larger unit would run to unwieldy decimals, in inch-ounces.

In the past, there has been a tendency to confuse torque with airscrew design. One has seen it stated that a propeller of a certain type should be used on such-and-such a model because it "has less torque" and will therefore lessen the tendency towards spiral dives.

This is very muddled thinking. Torque *reaction*, which is the effect that causes an aircraft to bank to the left, with a normal anti-clockwise rotating engine (viewed from the front) is entirely dependent on the torque generated by the engine.

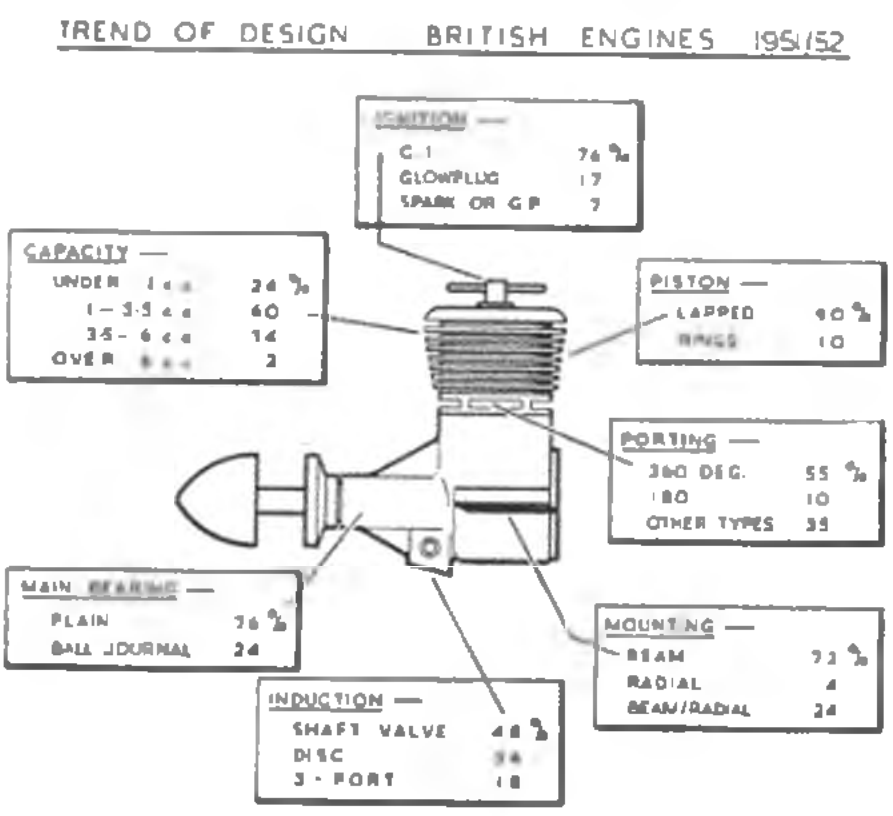
The only way in which a change of airscrew could influence torque value, would be by its power-absorption characteristics being either higher or lower, thus increasing or reducing the load on the engine and thus lowering or raising the shaft r.p.m. If, on the original airscrew, the engine had been running at a speed corresponding to the maximum torque—i.e., the figure developed at the peak of the torque curve—then a reduction in torque could be achieved by the fitting of a prop which caused the revs to rise or fall sufficiently to correspond with a point on the curve where less torque was generated.

Generally, running an engine at a high speed, rather than at an excessively low speed, is the most effective way of reducing torque without sacrificing power, but if the motor in question is designed for high speed and has an exceptionally flat torque curve, this may mean that an increase of several thousand r.p.m. is required—probably outside the limits for a propeller of efficient dimensions.

On the other hand, with some lower speed engines, increasing revs from, say, 8,000 to 9,000 or 10,000 r.p.m., can result in a considerable drop in torque where there is a quick decline of the torque curve beyond its peak.

For the most part, however, the torque curves of modern engines are such that no useful purpose is served by juggling with props to reduce torque reaction effects. Rather, a prop should be chosen which makes the best possible use of the engine's power, consistent with aerodynamic considerations, and a trim adopted to avoid excessive and undesirable banking from torque reaction. This really only applies, in any case, to scale type models. In competition free-flight types, design is generally such that torque reaction effects are subdued by counteracting forces, such as gyroscopic and slipstream effects.

B.H.P. or brake-horsepower, is the power developed by an engine as measured with suitable appara-



tus, such as a friction brake or reaction dynamometer. B.H.P. is the difference between the indicated horsepower (i.h.p.) or power developed within the engine before accounting for mechanical losses, and the f.h.p., or frictional-horsepower, and is thus the actual power available at the crankshaft.

Some confusion regarding the meaning of "horsepower" has been apparent in the past due to the existence of various formulae and rating systems, such as R.A.C., Rating, Treasury Rating, S.A.E. Rating, etc., as applied to motor vehicles. The Treasury or R.A.C. formula was originally devised, in the early days of motoring, as a means of rating motorcars and, used for taxation purposes, gave a purely nominal figure based only on the bore and number of cylinders. Thus did cars become designated "12 h.p.," "20 h.p.," etc., although, in fact, these figures bore little relation to the actual power delivered and the majority of touring cars now develop three to five times their R.A.C. rating, while a modern Grand Prix 2-stage supercharged racing car of 1½ litres—nominally, perhaps, 15 R.A.C. h.p., may develop as much as 400 b.h.p.

Full scale aircraft engines are normally rated according to their b.h.p. output at certain safe operational speeds and at certain altitudes. Unlike model engines, many full size engines are made to utilise only part of their maximum potential output, i.e., their rated working b.h.p. and r.p.m. are obtained below the peak of their power curves.

In all cases, however, the meaning of b.h.p. is the same and the definition for this is that one horsepower is the equivalent of 33,000 ft. lb. work performed in one minute. Thus, torque and revolutions per minute, multiplied together in a suitable equation, gives us brake-horsepower.

B.M.E.P. or brake mean effective pressure. More useful than the torque figure, as a measure of the efficiency of an engine, is the b.m.e.p. In effect, b.m.e.p. gives us a "specific torque" figure, i.e., one that is *relative to the capacity of the engine* and enables us to quickly compare the torque developed by different engines, irrespective of piston displacement.

Actually, b.m.e.p. refers to the average pressure exerted on the piston throughout the power stroke. B.M.E.P. curves form an extremely useful basis for comparison between different engines and also, incidentally, between different fuels. Being directly related to torque, b.m.e.p., always expressed in pounds per square inch, gives a clear indication of the efficiency of the engine in making use of the energy liberated by the combustion of the fuel. With current model two-strokes, a value of 40-45 lb./sq. in. is average. 50 lb./sq. in. or over may be considered good. 60 lb./sq. in. is exceptional and has only been reached or exceeded on four occasions during tests.

The speed at which the maximum torque or b.m.e.p. is reached is also significant. A high figure at low speed will indicate good low-speed flexibility and pulling power—e.g., the ability to swing a fairly large diameter prop. On the other hand, where the maximum b.m.e.p. is reached at high revs (or is maintained at a fairly even rate well up the r.p.m. scale) the designer's interest in the highest possible b.h.p. is suggested—as in all racing engines.

Piston Speed. Piston speed gives an indication of the useful life of an engine. For full scale practice, a value of 2,500 to 3,000 ft. per min. mean piston velocity, has been laid down as the maximum speed at which an engine should be operated continuously. Only in the case of high quality racing engines do piston speeds frequently exceed 3,000 f.p.m.

The piston velocity at peak r.p.m. reached in tests with a 10 c.c. model racing engine has not exceeded 2,400 f.p.m., this being realised at between 16,000 and 17,000 r.p.m. Appropriately, the lowest speeds (700 f.p.m.) have been reached with very small short-stroke c.i. engines where minimum bore wear for the maintenance of a good seal with lapped pistons is important.

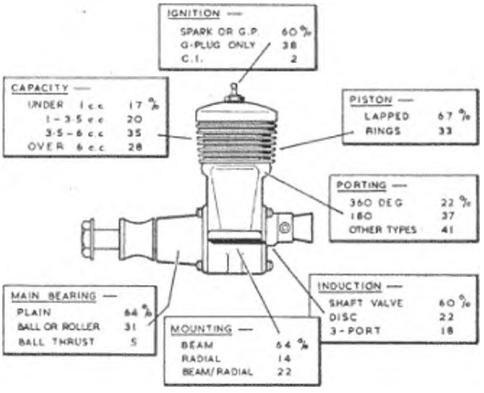
Power/Weight Ratio and *Power/displacement Ratio* factors are virtually self-explanatory. Power-to-weight ratio is simply the maximum b.h.p. divided by the actual weight of the engine and expression in b.h.p./lb. The power/displacement ratio gives a specific power factor which facilitates the evaluation of the performance of engines of different capacities and is obtained by dividing the maximum b.h.p. by the swept volume and expressing the result in b.h.p./litre.

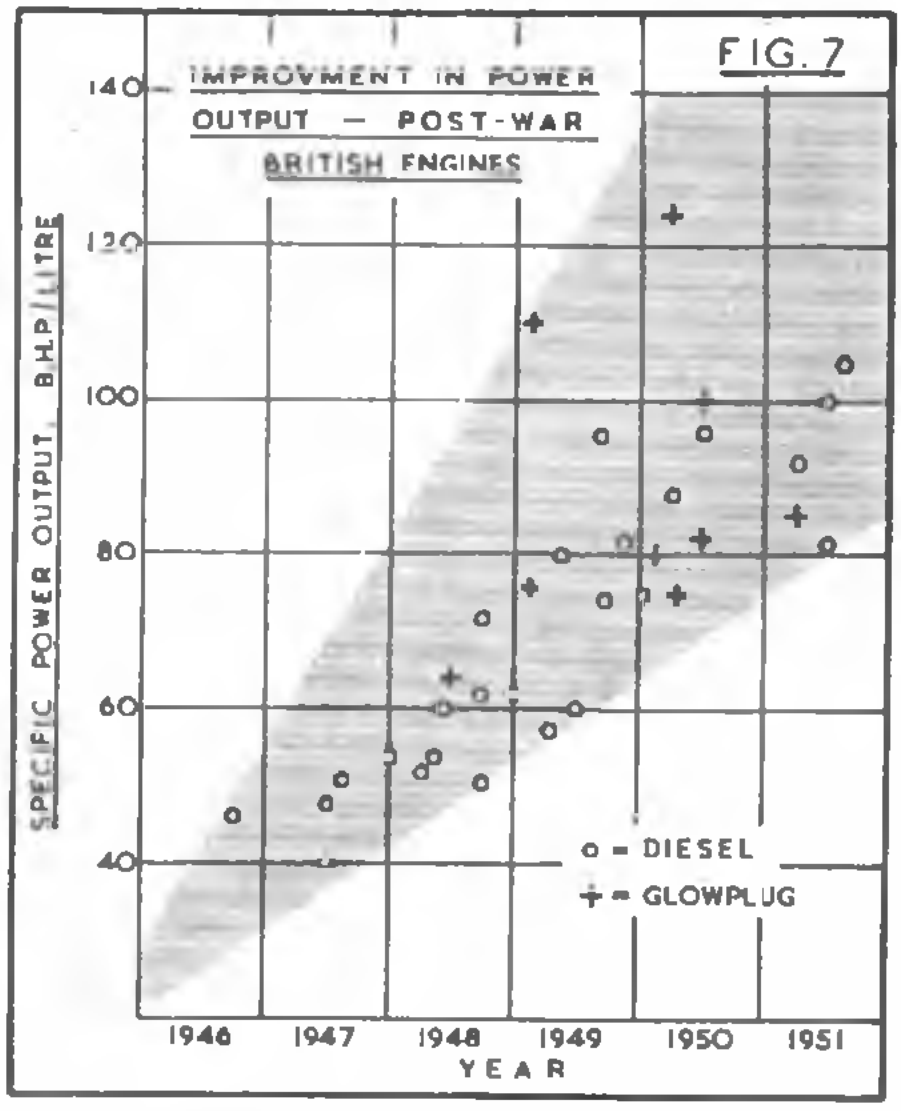
The advances in model aircraft engine design, and in the performance realised, have been outstanding during the past five years. Based on the average performance obtainable at the beginning of this five-year period, when the writer first started to conduct b.h.p. tests, present-day engines are, for example, about 100 per cent. more powerful.

The greater power, of course, has been mainly brought about by higher peak r.p.m., although improvements of up to 20 per cent. in b.m.e.p. have also been a contributing factor.

In general, the greater r.p.m. and torque can be attributed, almost entirely, to improved porting. The use of ball bearings in some cases has, of course,

TREND OF DESIGN AMERICAN ENGINES 1951/52





been of assistance in maintaining mechanical efficiency at a higher level than would otherwise be obtained at very high r.p.m. with plain bearings, but this has mainly applied to the very high-revving glow-plug and spark ignition racing types, as have improvements due to more powerful fuels. With diesels, fuel developments have not made any substantial contribution to indicated power outputs.

An analysis of the specific outputs of various British engines produced in the five years 1946/51, shows that the greatest advances were made in 1949.

This corresponds with the extensive adoption of the 360-degree porting system for diesels combined with a shaft type rotary admission valve, and led by Elfin and Amco. Although, of course, a few other diesels using different layouts have achieved similar levels of performance, it was this type that indicated the high power/weight ratios and r.p.m. which were previously considered the exclusive features of the high-speed spark-ignition and glow-plug ignition engine.

From power/weight ratios of less than 0.4 b.h.p./lb. common for diesels in the 1946/48 period, both the Amco 3.5 and the Elfin 2.49 achieved the magic one-horsepower-per-pound figure, with peak speeds well into five figures, the latter engine also distinguishing itself by being the first diesel to approach a specific output of 100 b.h.p./litre—a figure still confined to very select few among c.i. types.

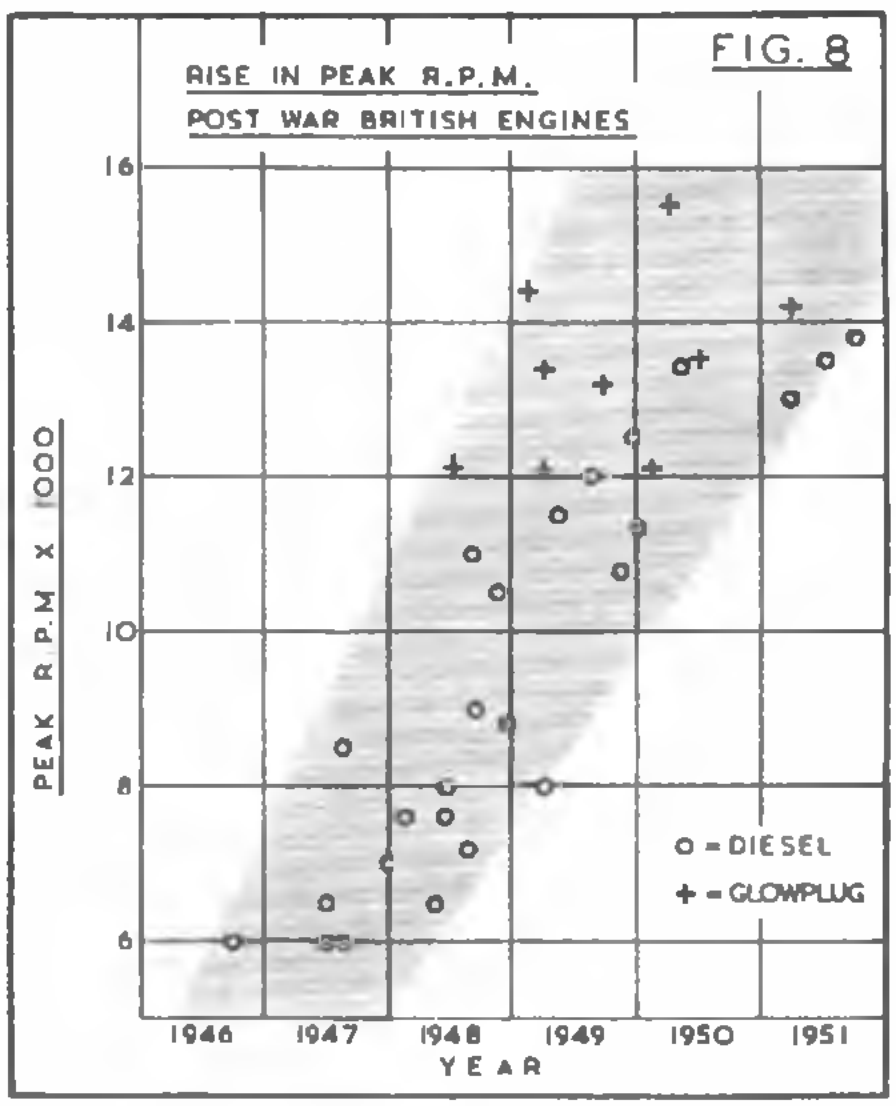
Lowest weight of any diesel on the basis of weight per c.c. was actually achieved by the Amco 3.5, but this was accompanied by a rather severe crop of structural failures and a retraction in favour of slightly greater weight was evident in the 1951 BB. 3.5 Amco model, which suffered no reduction in power/weight ratio, however, since a further substantial improvement had been made in b.h.p.

The tremendous strides which have, in fact, been made in British model engine design and performance are graphically shown in Figs. 7, 8 and 9.

Unlike the diesel, the glow-plug engine has not shown any marked improvement since its introduction to this country—except over one or two sub-standard designs appearing in 1948/49. This is due mainly to the fact that this type of engine, and the spark-ignition engine from which it had stemmed, had already been developed to a high standard in the United States and the general requirements of high-performance design were, therefore, already understood ; also because the very high output at high r.p.m. which are the attributes of the 5-10 c.c. class racing glow-plug motors, are no longer in such great demand, following the decline of interest in competition C/L flying.

It will be noted that a glow-plug engine does, in fact, show the highest value in each of the three graphs. All three top places, are, in fact, filled by the Series III model Eta "29," thus making this the best performing British model aircraft engine produced to date.

During the past year it has become increasingly evident that the days of new engines being introduced every month are gone. Standards of design, construction and performance have now been established and at no time since 1946, have design trends been so static. This applies not only to Great Britain, but to the United States as well and the time would seem to be ripe, therefore, for a general review of current design trends in both countries.

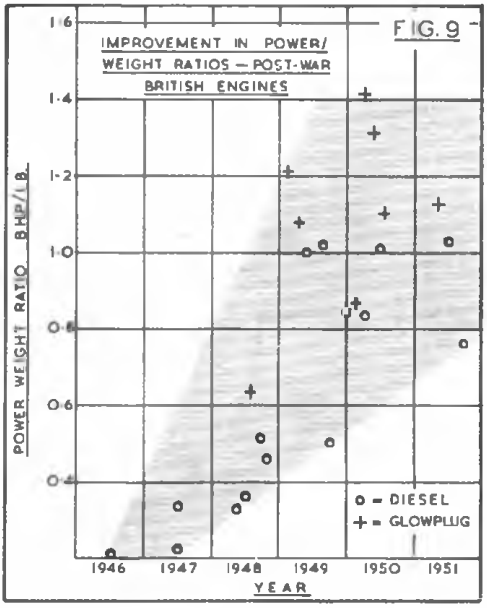


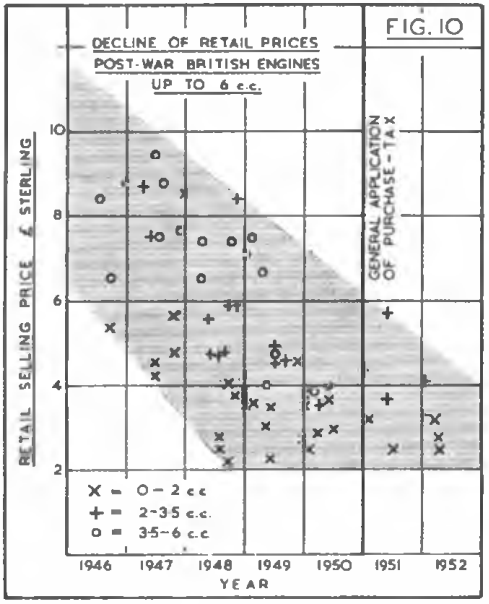
The accompanying illustrations on trends of design are based on all engines marketed in each country at the end of 1951. The percentages are based on the number of makes and types marketed—not on actual production or sales, in which the cheap and popular engines may far outnumber other types—and they do hot, therefore, constitute a poll of feature popularity.

From these analyses, it will be seen that the vast majority of British motors are compression-ignition types (76 per cent.) of between 1 c.c. and 3.5 c.c. (60 per cent.), with 84 per cent. of the total under 3.5 c.c. By contrast, the U.S. engines are almost exclusively spark-ignition and glow-plug types and the greatest number of engines are found in the 3.5 to 6 c.c. group (35 per cent.) and over 6 c.c. group (28 per cent.).

360-degree porting accounts for some 55 per cent. of British engines, but in America, where the system originated, only 22 per cent., mostly among the under 0.1 cu. in. sizes, employ annular port design. Only one in ten British models use the 180-degree exhaust port system common to racing types, whereas 37 per cent. of U.S. motors feature this.

The popularity of the shaft rotary-valve is firmly established in both countries, this type of induction having gained ground in America, over the disc valve, with the introduction of "Half-A" motors and of the shaft-valve McCoy models—formerly an exclusively disc-valve make, while even the well-known Forster "29"—pioneer of production disc-valve engines, has lately appeared in a shaft-valve version. This reversion to the simpler shaft-valve can, of course, be attributed more to the demands of cheapness than efficiency. The orthodox three-





port layout is now the least used and, in both countries, less than one in five engines now employ it.

Being mainly c.i. types, only one in ten British engines features piston-rings, but one in three American pistons is ringed, while almost an equal number of U.S. engines have ball or roller main bearings, against one in four British motors thus equipped.

Methods of mounting show similar trends in both Britain and the U.S., beam being the most popular. Where radial fixing is featured, this is more frequently found to be complementary to beam mounting lugs, than as the sole method of mounting.

Not the least important development, in post-war model engine production, has been the very considerable decline in prices. This, so far as British engines are concerned, is shown in Fig. 10, for engines up to 6 c.c. and is particularly noteworthy for the fact that, during this same period, most other manufactured goods have steadily risen in cost to the consumer. A slight rise has been evident following the general imposition of purchase-tax from the end of 1950 but, for the most part, the general level of prices is actually lower than the pre-war average.

NEXT MONTH

MODEL AIRCRAFT will contain a full report and pictures of the Wakefield Trophy Event held in Sweden. Be sure not to miss this issue.

Topical Twists

Special Aircraft

The most momentous event in the model world since the launching of the first thermal is the recent record application for a revolutionary type of special aircraft. By the simple process of mating the upper works of an autogiro with an ordinary glider a form of perpetual motion has now been established and the bogey of gravity at long last overcome.

The principle on which this unique machine works is of such utter simplicity that even a child can understand it. Perhaps had I been a child I wouldn't have found it so incomprehensible. Still, I must say that the idea appeals to me. Even as a small boy, I never could understand why my little chum's kite could fly merrily aloft for hours on end while my own little aeroplane would persist in falling to the ground almost as soon as it was launched. This was just as inexplicable to me as the fact that, whereas I could quite easily lift up other little boys of my own size and weight I couldn't elevate myself one single inch off the deck. I'd stand in a basket and tug at the handles for hours, but always without result.

Now I no longer need be disturbed by the memory of that blooming kite After tacking a set of vanes on the old glider I'll at last have a model which doesn't have to come down every few minutes for a shot of fuel, a wind-up of rubber, or a long, hard tow. And no strings attached either.

• • •

Observers at a recent High Court action were impressed with the judge's quick grasp of the fundamentals of R/C model flying.

This suggests to me that it would be a good thing for our learned judges to be brought into closer contact with those light-fingered airfield lurkers who have an equally quick grasp of the fundamentals of power model flying.

" Well, he says it's his own design, but it looks vaguely familiar, somehow."

A Million Chuck Gliders

It is well said that the road to a certain torrid, subterranean domicile is paved with good intentions. This could be aptly applied to the recent efforts of a number of well meaning back seat fliers to unleash a pestilential horde of chuck-gliding young perishers on to our already much abused flying fields.

That the scheme is a worthy and public spirited one I have no doubt, and were I not a selfish model flier without any concern for the well-being of the nation's youth I would unhesitatingly give every support to the policy of driving the destructive little brutes into large open spaces, where they would be rendered less harmful to the peace loving community. However, as a selfish model flier, with the usual dog-in-the-mangerish attitude towards his few privileges, I am quite happy to see the delinquent little juveniles tearing down my fences, breaking my milk bottles, or smashing my windows, just as long as they *stay off the flying field* !

• • •

Where Two's a Crowd

Official eyebrows were raised askance when recently a model club with a total establishment of only two members unabashedly applied for re-affiliation. On the surface of things it does appear rather an impudent request. Or perhaps a pathetic one—it all depends upon your point of view. My own view is that, if by happy chance, both members are on the active flying list, then the club, albeit small, must be regarded as a much livelier proposition than many a club with a long and impressive paper membership.

Indicative of this is the existence, in the London Area, of an informal body known as the Fairlop Mutual Aid Society. Only two qualifications are necessary for admission to the society : a model box and a lost look. The present membership, about a dozen, comprises the active flying elements of some 20 or more London model clubs. *Flying*, repeat *flying*, meetings are held every Sunday, and all refugees from paper clubs are extended a hearty welcome.

Speaking to a newly joined member, I was informed that he was officially attached to a large and flourishing club. A really go-ahead sort of concern, simply swarming with brisk and efficient types busily organising its many and elaborate functions. Club meetings, A.G.M's and other official fixtures were models of their kind, and the annual programme was a star studded galaxy of exhibitions, dances and lavish club dinners. Yet in spite of all this commendable club activitiy our friend confessed to feeling rather out of things. He couldn't quite understand why, but thought it might be due to the fact that he was the only member who still flew model aircraft.

• • •

London Area officials are looking a trifle less careworn since the authorities decided to drop the Fairlop back rent claim. The only back rents now being collected are by bods climbing over the new barbed wire fencing.

• • •

One club, we hear, has decorated its airfield clubroom with beer mats. Judging by the rate at which modellers are being kicked out of aerodromes all over the country I should have thought that prayer mats would have been more in keeping.

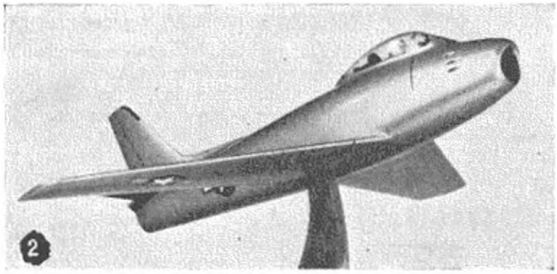
Pylonius

Photonews

No. 1 on this month's variety bill, is a photograph by J. B. Stewart, of Salisbury, and shows fellow club member L. Wheeler hand-launching a very sleek-looking semi-scale power model.


1

The beautiful solid in photograph **No. 2** was built by Phil Landray, of the Wimbledon Power Club, and is the prototype of a range of models which will be made available to American and Canadian Air Force pilots in England. The model is a 12½ in. span North American *Sabre*, and has a really superb sprayed silver finish. The photograph was taken by R. A. Adams.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3

In **No. 3** we have something really ambitious in the way of radio-controlled models. In the picture, newsreel cameramen are seen filming a demonstration flight by a 1/10 scale model of the U.S. Navy's XP5Y-1 turbo-prop flying boat, at San Diego Bay, Southern California, where tests are carried out by Convair's hydrodynamic research lab. The model is actually powered by jets, and the control panel on the right of the picture certainly involves rather more than the usual press-Button-A technique!

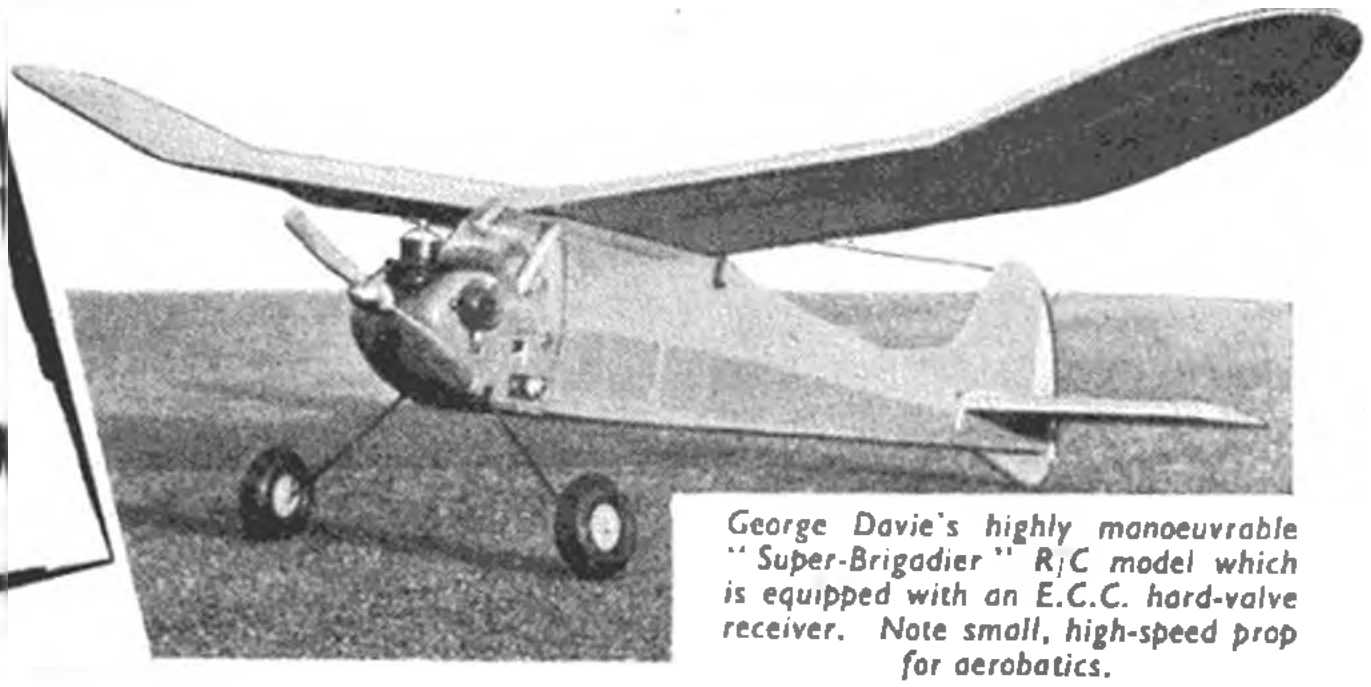
In photograph **No. 4** we are treated to a portrait of that well-known Fairlop landmark—Len (Stoo) Steward of West Essex. The model with the rather vacant expression that he is seen holding, is his Kestrel-powered *Little Tram*, an R/C model using a home-built receiver. It has flown consistently for the past two years, and was flown between the vee aerial masts on its first day out! The photograph is by Chas. Taylor.

Our star award this month goes to **No. 5**, a beautiful 1/9 scale Hawker *Demon*, by D. Bryant, of the South London Scale club. The model is powered by an Elfin 1.8, is silk-covered, and with a span of 44 in., weighs 2 lb. 2 oz. It is finished in the colours of No. 23 Sqn., and was photographed by J. Savage with—a box camera! Panchromatic film was used, with a pale green filter and a close-up attachment.


4

5

Mainly Radio Control



George Davie's highly manoeuvrable "Super-Brigadier" R/C model which is equipped with an E.C.C. hard-valve receiver. Note small, high-speed prop for aerobatics.

ACCENT ON POWER

BY

P. G. F. CHINN

LATELY we have been flying a Berkeley *Super-Brigadier*. (Note to old-timers: this is not to be confused with the *Super-Buccaneer* of pre-war fame). This model is good: outstandingly so. Yet the design is really quite conventional—conventional in that it is a straightforward high-wing cabin monoplane of moderate dimensions and uses none of the strictly "R/C model" features which have come into fashion, most of which can be traced to the *Rudderbug*.

The *Brigadier* was designed by the well-known American free-flight expert and former National Champion of that country, Henry Struck (with certain of the structural design by Bill Effinger) for R/C and P.A.A. Load contests. It is kitted by Berkeley Models Inc., of New York, and has had a number of contest successes during the past couple of years or so.

The model has a wingspan of 57 in. and is approximately 38 in. long. The wing area is 480 sq. in. and the empty weight of the P.A.A. Load version is given as 29 or 33 oz. according to whether a spark ignition or glow-plug engine is used. For the R/C version, using the standard ultra-lightweight "Aerotrol" receiver and escapement installation, an all-up weight of 36-oz. is quoted. Engines of up to 0.29 cu. in. (5 c.c.) are specified for P.A.A. Load events. Installations mentioned on the plan include data for the Ohlsson .29, McCoy .29, K. & B. Torpedo, Drone-Diesel and Arden .199.

With the actual *Brigadier* in question, George Davie, whose model this is, decided to start off with an E.D. 2.46, with the idea of changing to an Amco or something similar, if greater power were needed for aerobatics. It was felt that this might well be the case, particularly as, instead of the "Aerotrol," it had been decided to try out the new E.C.C. hard-valve set which, of course, would put the weight up slightly. In any case, by British standards, a 2.46, even at a weight of 44 oz. (as the model eventually turned out to be) does not suggest underpowering in R/C.

Using this engine and radio installation, some juggling with the interior arrangements was necessary to get the batteries suitably located and the fuel tank, a "Slipstream" transparent type, was eventually mounted on the side of the cowling. However, this has an advantage in that the fuel level is at all times visible; also that it feeds satisfactorily in manoeuvres.

With a diesel motor, of course, any marked variation in load at the crankshaft is apt to make the engine cut out or stall. This is particularly so when a large prop, running at moderate revs, is used on a radio-controlled model. Putting the model into a spiral dive, which causes airspeed to rise sharply and reduce load, is then likely to cause engine speed to over-run the compression adjustment, i.e., for the ignition timing to become much too late, with the result that the engine will misfire, then cut out completely. Alternatively, should it be possible to keep the engine running under reduced load (possibly by sending the model off slightly over-compressed) any attempt at a steep climb, such as for a loop, will tend to overload the engine and cause it to stall.

These conditions are always aggravated by the use of extra large props and consequent low revolutions. The E.D. 3.46 powered *Junior* 60 illustrated, for example, is shown equipped with a 14 × 6 wide blade propeller. This gives a good take-off and a steady flight with several minutes running on a standard tank. In fact, the level flight performance is, to all intents and purposes, just as good as can be obtained with the engine delivering twice the output on a much smaller prop. The model cannot perform even mild aerobatics, however, since a 360-degree turn will immediately cause revs to build up to a point where the engine cuts itself out! Useful for avoiding power-on spiral dives if control is lost, but no good for advanced work.

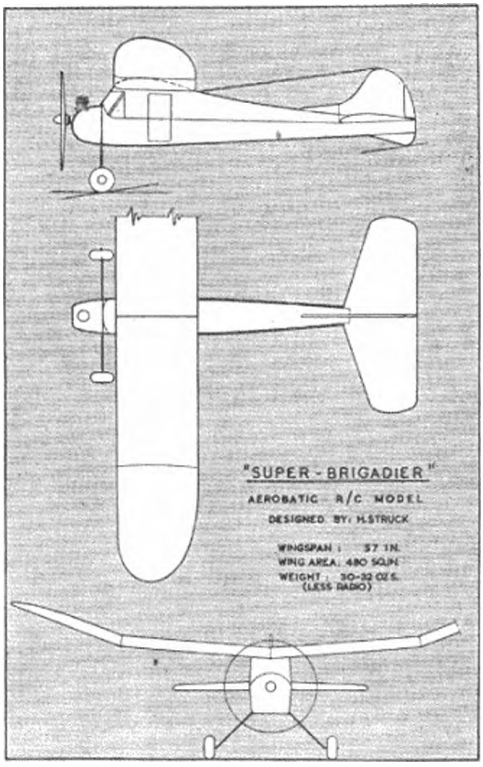
For the *Brigadier*, therefore, a prop was chosen which would allow fairly high revs to be maintained irrespective of airspeed. This presumably meant that a substantial slip would be tolerated with the model climbing, so that the most efficient dimensions aerodynamically, would be the opposite of our requirements.

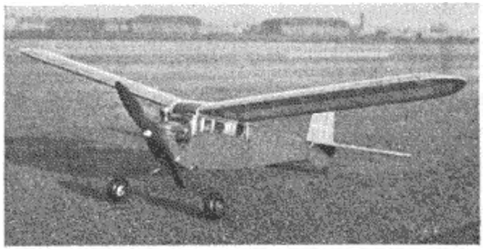
With this in mind, a thin narrow-blade Stant propeller of 10 in. diameter and 5 in. pitch, but with tips tapered and rounded, was thought to be the largest size that could safely be used. With a prop of this type, a good 2.46 will turn close to 9,000 revs and our choice has, in fact, had the desired effect.

With the model thus equipped and with a fine disregard for the possible consequences, George handed the writer the transmitter key for the *Brigadier's* maiden flight. Believing that, on the engine/prop combination used, we would need practically all the available power, the model was sent off with the 2.46 adjusted to maximum revs.

At first, it seemed that the climb was too shallow but, having no engine offset and having a slight left rudder bias, the model was turning off to the left rather sharply. A slight application of right rudder gave instant response, the model heeling quickly to the right and into a fast climb. Thereafter, a periodic touch of right rudder kept it on a slightly zig-zagging course up to 300 feet or so. It was obvious, from the rapid response to control and the speed under power, that this would easily be the nearest to an aerobatic R/C model out of six types flown to date ; nevertheless, we were hardly prepared for what happened next.

Having gained a safe altitude, it was natural to





Large prop on this E.D. 3.46 powered " Junior 60 " eliminates risk of a power-on crash in the event of radio failure.

try a turn. We had meant this to be to the right—i.e., against the torque and inherent left turn—but somehow contrived to give left rudder. The model seemed to spin round in its own length, drop a wing, and hurtle earthward in the most frightening spiral dive we have ever seen. Panic-stricken, we punched the button and in no time at all, the *Brigadier* seemed to have climbed fifty feet almost vertically. We have no very clear recollection of what we did, but the model seemed to wing-over, loop and roll and then quite suddenly settle down into level flight again—following which, the writer suddenly became conscious of the transmitter key, cold and clammy in the hand. . . . A cheer went up from watching friends. Weakly we had to admit that the whole spectacular manoeuvre had been purely unintentional.

However, the main thing was that the motor had run without a miss throughout these violent manoeuvres. When the engine cut, the model settled into a steady glide. Rudder power now seemed to be just right for accurate manoeuvring for a touch down and, with no conscious effort, the model was brought in to land within a hundred feet of the transmitter.

The respective and differing flying qualities under power and glide are one of the good features of this design. So many stooge-type R/C models positively lumber along under power, seemingly sensitive to control because they are all too ready to tumble earthward, yet are without a correspondingly rapid response to pull out from such tumblings, while this glide is often faster than the power flight.

The *Brigadier* is in direct contrast. Its speed under power is good ; climb to an adequate altitude for aerobatics takes little time without excessive loss of forward speed against moderate winds, while correction is extremely rapid. The glide is what one would expect of a 13 oz./sq. ft. loading and clean design, and the control in the glide inspires the sort of confidence essential for safe manoeuvring near the ground and spot landings.

A few days after its first outing, having straightened out the left bias, but with still no right thrust to correct torque, we took the *Brigadier* out again. On this occasion, we had a visit from E.C.C. designer Steve Fairbrass. Of course, we made good use of Steve by getting him to check the receiver, after which he was forthwith handed the button.

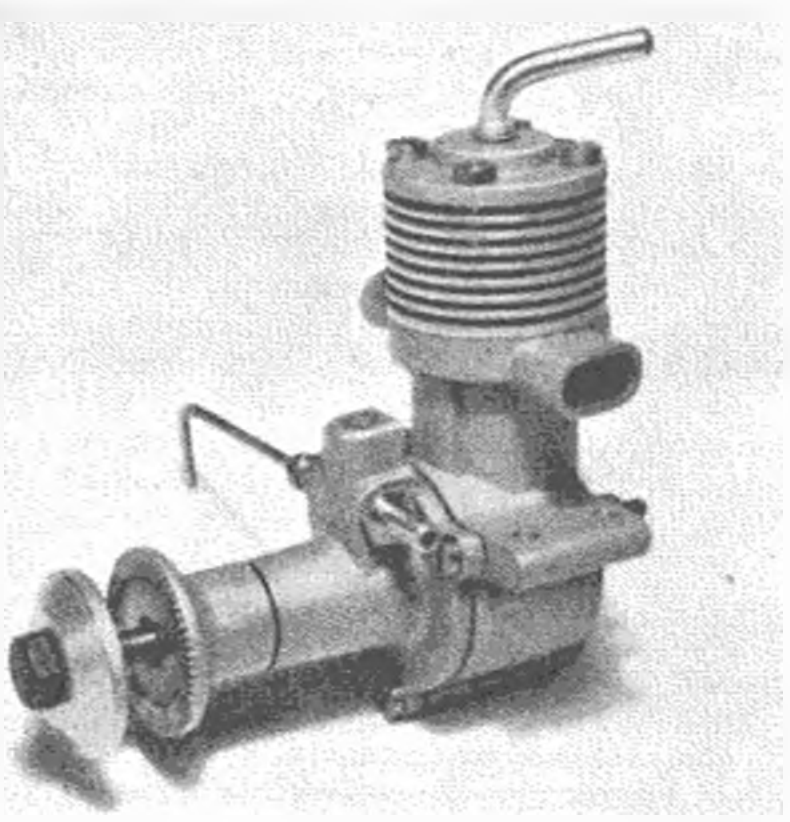
As the model took to the air, we thought it expedient to venture a word to Steve : " You'll find this model quite responsive." To which, a second or two later, Steve, correcting the left turn, declared, " You're telling me."

At about 300 feet we said, " Now try left rudder, till' loop easily." " No fear," said Steve and spun the model to the right, neutralised and did two loops, clean and round, just like Gold Trophy stuff.

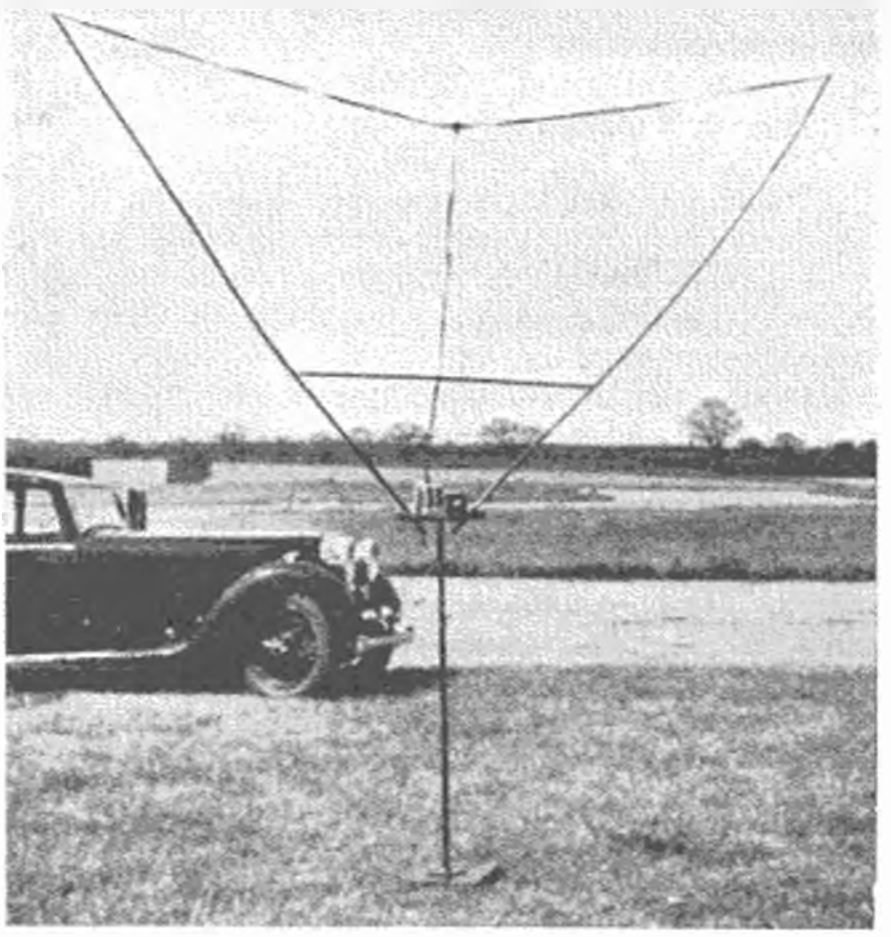
Frankly, we have never associated rudder-only R/C models with consecutive loops and this seems to be an effective answer to the claims of some people that R/C is in a rut. Presumably there are not very many aerobatic R/C models in the country, but their owners would probably agree that the only thing which discourages the development of the true R/C stunt model, is the " radio failure " worry. If the rudder should stick over on the *Brigadier* at any height under power, it is doubtful whether the pieces will be worth picking up, and the same would apply to any high aerobatic model unless some sort of over-riding safety control, operating on a separate channel, could be built in.

With the *Brigadier*, these disquieting thoughts on the dire consequences of radio failure have so far only initiated the construction of a duplicate model which, by the usual law applying to such things, should mean that the evil day will be indefinitely postponed. . . No reflection on the efficiency of the E.C.C. hard-valve receiver must be inferred—this set has so far given no trouble—but we cannot guarantee our own infallability when it comes to keeping the radio gear 100 per cent.

For the second *Brigadier*, it has been decided to use the Norwegian David-Anderson 2.5 c.c. diesel (recently featured in the " Engine Tests " series) which, as the test curves indicated, has a power equal to the 2.46 up to about 9,000 r.p.m. and slightly better at lower speeds. This is a very nice engine to operate and an advantage lies in the fact that, being a shaft-valve model, better tankage and battery arrangements, unhampered by a rear intake, will be permitted.



A good engine for R/C. The David-Andersen 2.5 c.c. diesel.



Half-wave aerial on rotating mounting.

Without wishing to appear dogmatic, the writer feels that it is in this type of model that, for the next few years, the greatest promise in R/C power models lies. That is to say, in medium size and weight, with plenty of power, allied to an aerodynamic layout giving a high degree of " free " flight stability, but with sufficient rudder power to induce rapid manoeuvrability.

GENERAL DATA—E.D. 2.46 POWERED " SUPER-BRIGADIER "

Designed by :	H. Struck (U.S.A.)
Total Weight : ...	44 oz.
Overall Length : ...	38 in.
Mainplane :	
Area (gross)	480 sq. in.
Span	57 in.
Planform	Parallel. Elliptical tips.
Chord	8.875 in.
Aspect ratio	6.77
Section	13 per cent. Flat undersurface.
Tailplane :	
Area	135 sq. in.
= per cent. wing area	28.1 per cent.
Span	21.25 in.
Section	10 per cent. Flat undersurface.
Undercarriage : ...	Single leg. ¼ in. spring steel. 2½ in. airwheels.
Engine :	E.D. 2.46 c.c. diesel.
Airscrew	10 x 5 Stant. Tips rounded.
Receiver :	E.C.C. 951A (hard valve).
H.T. Batteries ...	67½ volts. 3 x B 122.
L.T. Battery ...	1½ volts. 1 x D.11.
Actuator :	E.D. rubber driven.
Battery	4½ volts. 1 x 1289.
Control :	Rudder. 2 position, self-neutralising.
Specified Rigging Data :	
Mainplane angle of inc.	1½ deg. pos.
Tailplane " " "	2 deg. neg.
Thrustline, down ...	Zero
" side ...	Zero.
C.G. location ...	40 per cent. chord.
Loadings :	
Wing	13.2 oz. /sq. ft.
Power (approx.) ...	14 lb./h.p.

Letters to the Editor

● **The Editor does not hold himself responsible for the views expressed by correspondents. The names and addresses of the writers, not necessarily for publication, must in all cases accompany letters**

1914-18 PROTOTYPES FOR FLYING SCALE

DEAR SIR,—In reply to Mr. Savage's letter, may I say, firstly, that my article "1914-18 Prototypes for Flying Scale" was written some time before details of Mr. Norman's *Camel* and *Triplane* were published.

Secondly, the article was based on many years' experience of *rubber-driven* flying scale models, and was intended as a general guide to those aircraft of the Great War suitable for reproduction, as *inherently stable* flying scale models. The writer has no use for problematical aids to stability, such as pendulum controlled surfaces. If a prototype cannot be reproduced in model form, incorporating *inherent stability*, without too much departure from scale, then I never bother to proceed further with it. Such was my experience with rubber driven models of the *Camel* and *Triplane* and that was why I stated that such aircraft were *unsuitable for reproduction as inherently stable model aircraft.*

Mr. Savage should really not adopt the political expedient of lifting sentences from their context, and using them to belabour fellow scale enthusiasts whose views fail to coincide with his own. I wrote :

" . . . The *Camel* . . . is not suitable for reproduction as a flying scale model. *I do not imply that, in the hands of an expert a well designed model would not fly, but it would be hopelessly unstable, and certainly no machine for trouble free 'sports' flying.*"

I have never had the pleasure of seeing Mr. Norman's *Camel* in flight, but it is reasonable to assume that the flight characteristics of "P.E.'s" heavily wing-loaded and overpowered scale models are very far from true scale flight and performance. I do Mr. Norman no injustice, for he himself stresses the fact that his models are ruggedly built and stressed to withstand hard knocks and crash landings. So are the writer's, but the average weight of a ¼th scale model is round about 1¼ lb. In consequence, I find that a good 1 or 1½ c.c. motor produces ample thrust to fly such a model, with a correspondingly low wing loading—and therefore a much more realistic scale performance. I am, of course, referring entirely to 1914-18 biplanes.

Possibly the spectacle of a model *Camel* or *Triplane* cavorting about the sky at scale *Spitfire* speed may be Mr. Savage's idea of scale model flight but it is certainly not mine.

I can well believe that Mr. Norman's scale *Triplane* has an excellent glide. So, no doubt, would the oft-mentioned barn-door, provided it were properly balanced and stabilised, and dropped from a sufficient height.

In conclusion, I am obliged to concede Mr. Savage's point apropos "Richthofen." I disposed of my copy of "Richthofen—Red Knight of Germany" some time ago, and none of my other books give authentic information concerning the particular type number of the *Albatros Scout*, used by the Richthofen Circus, prior to the *Fokker Triplane*. To the best of my recollection, the colloquialism "Vee-Strutter" was used by the wartime R.F.C. to designate the *Albatros D5* single seat *Scout* and this is the description given in their writings by McCudden and most other British airmen who fought the "circus."

Yours faithfully,

Portslade, Sussex. A. W. GARRY.

ANGLO-AMERICAN PROXY CONTESTS

DEAR SIR,—We here in America respect very much the standard of British free-flight flying, which is considerably better than ours. This has been due, in great part to the failure of the U.S. to take much part in international model aero competitions. We hope to remedy this situation soon.

If there are any clubs in Britain that would like to hold "proxy challenge meets" with our club in free-flight power, rubber and glider, they are welcome to write to the Polar Buzz Bugs, 2300 Gall Avenue East, North Saint Paul, Minnesota, U.S.A. The meets would be held on each of the club's flying grounds on the same day. This would be a novel arrangement at any rate. Also if there are any fliers that would like to have models proxy flown in our contests and at the same time, fly one of our models in non-S.M.A.E. competitions in England, we would be happy to hear from them.

Yours faithfully,

North St. Paul, Minn., U.S.A. JAMES BALTES,
Corresponding Secretary.

OVER THE COUNTER

Jetex "Jetmaster"

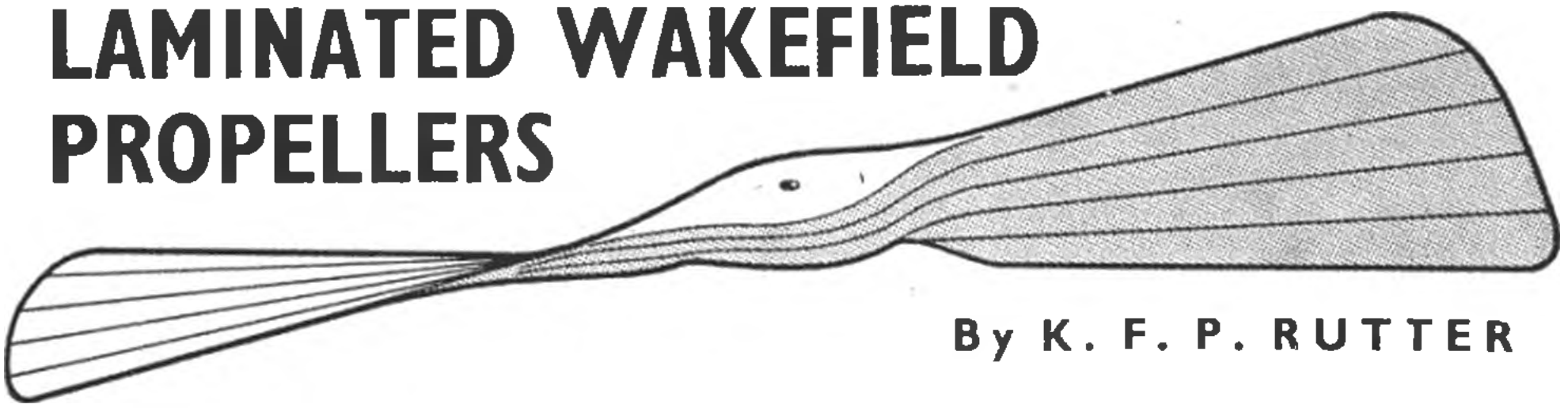
(*Continued from page 367*)

simple. But the actual location of the jet unit does not appear positive enough. If the wires on the clip assembly are bent in re-assembling the unit then accidental sidethrust may be given to the unit—not that this is likely to affect flight performance for "Jetex" units usually need an excessive amount of offset before "sidethrust" effects are apparent. More serious, however, is a tendency for the unit to come loose, or even drop out, if mounted inverted, and inverted mounting of a Jetex motor under the fuselage is a very popular design layout. A remedy is to squeeze the sides of the clip fairing in so that they grip the spring clip tightly.

All told, we could not help but be favourably impressed with the "Jetmaster." It is certainly a powerful jet unit capable of delivering over twice its own weight in direct thrust. As such it is undoubtedly *the* "Jetex" unit for duration flying. The introduction of an augmenter tube, of course, also makes it the ideal power unit for flying scale and semi-scale jet models where the jet unit can be completely enclosed in the fuselage.

A specification for a duration design would be a wing area of about 150 sq. in. and a total weight in the region of 3 oz. including loaded "Jetmaster" and augmenter tube. It should be capable of flight ratios in excess of 10 : 1 i.e., an average "still air" duration slightly in excess of 2 min.

LAMINATED WAKEFIELD PROPELLERS



By K. F. P. RUTTER

LAMINATED propellers are not exactly new. In fact they have been used in aviation ever since pilots wore knee-breeches and tweed caps with the peak facing aft. But the value of the method when applied to Wakefields seems not to be generally recognised.

The writer first started laminating Wakefield propellers about two years ago, when block wood of the right quality was hard to get. Experiments were also being made at that time with constant-thickness propellers and the two ideas fitted nicely together. So if you are interested in strong light Wakefield propellers which cost about a third of the normal block price, read on.

Assuming your propeller is to be eighteen inches in diameter, which is the most economical size, you need first to know the pitch. Most rubber-twisters have their own ideas about this, but if it is to be between 26 and 32 in., Table 1 will give the width of the blank at the tip. This is for a depth of 1¼ in., which again is an economical figure giving average blade area ; but if you want a real wind-shovel, use greater depth and increase the width in proportion. As an example, we will have a 30 in. pitch propeller, the blank for which will be 1¼ in. deep and 2.33 in. wide at the tip.

Now take five strips of quarter-inch sheet balsa, eighteen inches long and one inch wide. Recourse to mathematics will reveal that these can be cut from a stock-size sheet of quarter, with one strip left over. But if you are really gunning for old Sir Isaac, you can grade the wood so that the medium balsa goes into the top and bottom laminations and soft in the middle. Now drill each of the strips through the centre with a $\frac{1}{16}$ in. drill.

Next arrange a $\frac{1}{16}$ in. hole in the building board and insert a piece of 16 s.w.g. wire so that it protrudes about 1½ in. vertically. This wire is the "jig" for the centre hole of the propeller, so it must be truly vertical from all sides. Slot the laminations on to the wire and splay them out so they measure 2.33 in. (for 30 in. pitch) at the tip. Use a ruler and setsquare for this, as in Fig. 1.

It is possible to make very good left handed propellers this way, so watch it. You don't want symmetrical splaying out of the strips ; they should be crowded somewhat towards the rear of the propeller to give room for adequate undercamber in the carving stage.

Mark on each lamination with a ball pen the position of the lamination above it. Then take them apart, cement well and replace on the wire, pinning each strip to the next. Before the cement gets its hooks in, check the width at the tip once more, and—can you wind up sixteen strands backwards ?—If so don't bother to check if it is a right-handed block or not.

The block will take about twenty-four hours to dry out. If you carve before the cement has set thoroughly it will pull in at the joints and give you a

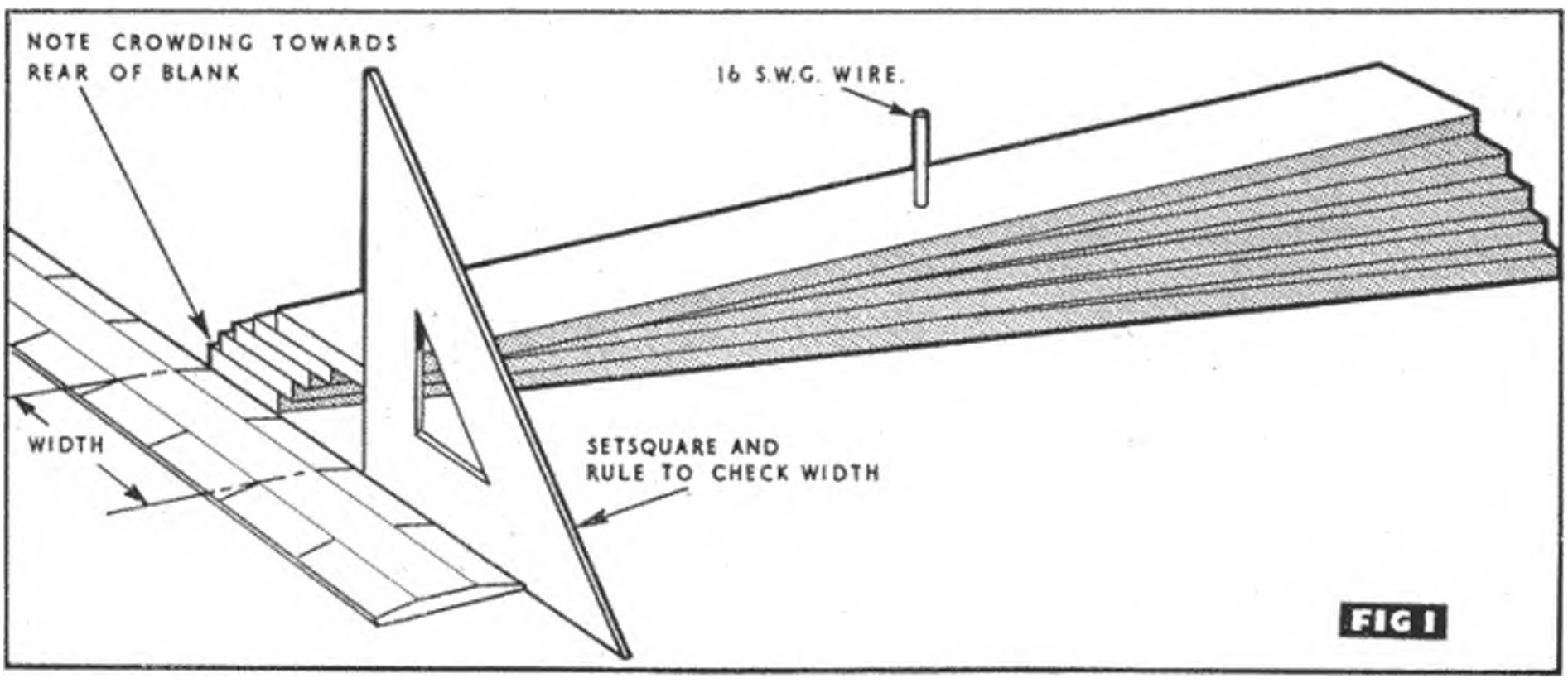


FIG 1

scalloped airfoil section. Before carving use a ball pen again to draw lines joining the opposite corners of the blank on both front and rear faces. These lines will be the leading and trailing edges of the propeller and will give a true helical pitch all the way down the blade except at the centre where a boss of some sort must be left. This will vary with individual builders (Fig. 2). About $\frac{1}{2}$ in. width at the centre is the minimum for reasonable strength.

Similarly, during the carving a cutaway should be made at the rear of the boss to reduce drag and weight there. Again this is at the discretion of the builder, but not less than half an inch thickness should be left (see heading picture).

The carving itself is straightforward, with less wood to cut away than with a normal propeller. In the writer's opinion the tips should be left almost square but they can of course be rounded off.

Well, that's it. Advantages over the normal block method are :—

1. Cheapness. The cost is that of a sheet of quarter inch balsa and half a tube of cement.
2. Strength. The cement layers add strength, and the grain fans out as the blade width increases towards the tip.

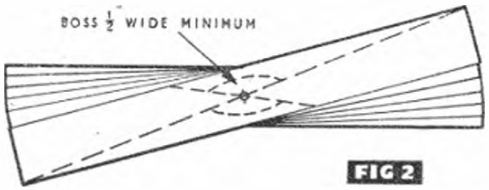


FIG 2

3. Lightness. By putting soft wood in the middle layers the weight of a finished Wakefield propeller, noseblock, shaft and dural bobbin need never exceed 0.9 oz. and can even be less.
4. Ease of construction, particularly in the matter of getting the hole centred.

In conclusion, the above refers to Wakefields, but the method has been used by the writer for all sizes of rubber-driven propellers with complete success.

Blank dimensions at tip for thickness of 1.25 ins.							
Pitch ins.	26	27	28	29	30	31	32
Width ins.	2.7	2.6	2.5	2.4	2.33	2.25	2.17

MODEL AIRCRAFT

Engine Tests

(*Continued from page 361*)

than other Class "A" capacities, but generally respond satisfactorily to one particular approach. With the Frog "50," the compression-lever was slackened off one-quarter to one-half a turn from the normal setting. The needle-valve was left at its running setting (approximately five turns open), the engine choked for about half-a-dozen flicks and primed with a few drops of fuel through the exhaust port. This procedure was found to produce a certain start within a few flicks. In general, the "50" likes to be fairly "wet" for starting—but, of course, care should be taken to avoid getting too much raw fuel into the combustion chamber.

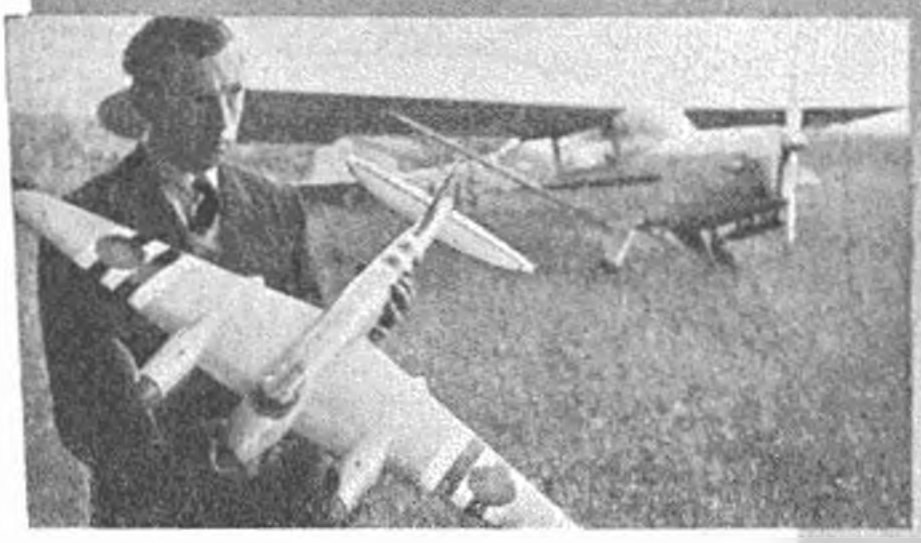
Mention has already been made of the Frog "50's" ability to hold high r.p.m. for long periods without loss of power. The most useful speed would appear to be 10,000-12,000 r.p.m., the lower figure corresponding to that approximately obtainable with the standard Frog 6 × 4 plastic airscrew, on which the engine starts and runs very well indeed. For scale models, a slightly larger and thicker section prop can be used to limit revs to about 8,000 r.p.m.

Power/weight ratio : (as tested) 0.57 b.h.p./lb.

Power/displacement ration : (as tested) 85 b.h.p./ litre.

OUT OF THE MOUTHS . . . By Harry Stil

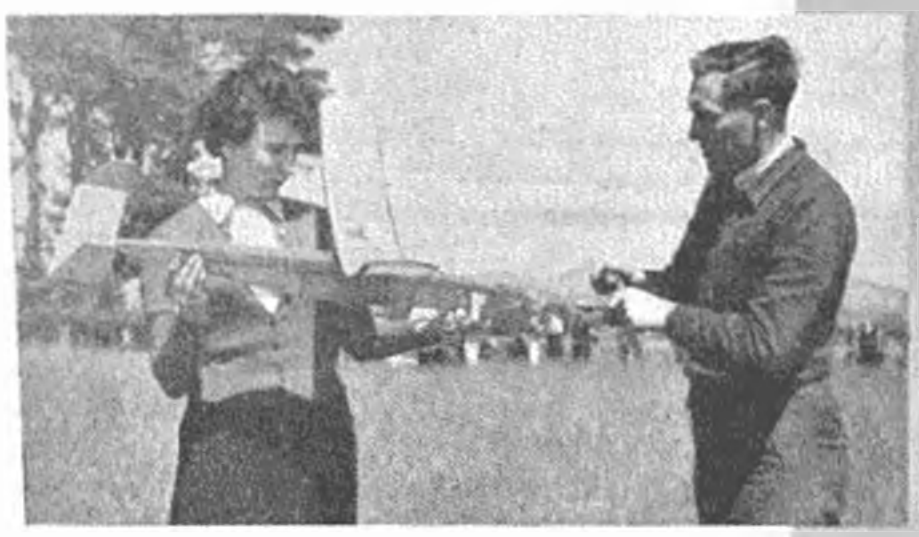
BUTLIN'S Contests



Winner of the Concours at Skegness, G. Langdale of Lincoln is seen at the aerodrome with his C/L Mosquito.

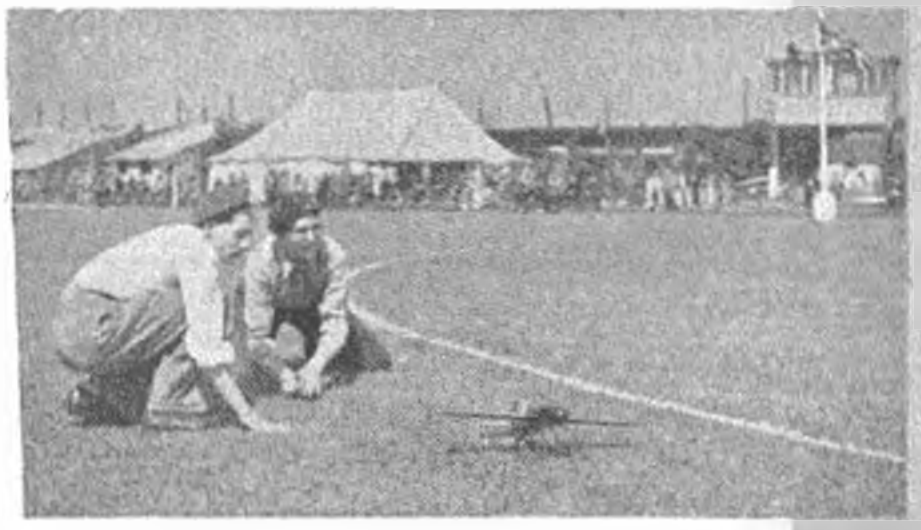
Booker, 'Lavery and Edgar of Barnsley during the team race at Filey.

Another Filey picture, this time a glider, plus more than a little "human interest"!



At Pwllheli, C. Wyatt of Aston with a lady assistant, winding up his rubber model.

Dennis Tricket and Fred and Freda Massey, with the Grimsby club's winning team racer at Skegness.



The two John Howards (unrelated) of the Foresters, release M. Hawforth's model in the Skegness team race.

A discussion over a C.L. Fokker Triplane, between Ray Maxwell, organiser of the contests at Ayr, and band leader Ronnie Caryl.

(Left) Vic Dubery entered in the rubber contest at the Filey camp.

USEFUL CONVERSION TABLES

CONVERTING c.c.s into cu. in. and cu. in. into c.c.s is always something of a bother. Most people know the "popular" sizes—0.19 cu. in. = 3.25 c.c., 0.29 cu. in. = 5 c.c. roughly, and so on. Conversions from c.c.s into cu. in. are not so well known.

To give an immediate solution to these problems the two following tables have been prepared. One converts c.c.s into cu. in., and the other cu. in. into c.c.s. Integer conversions, 1, 2, 3, etc., are given in the first column of the table, the following columns giving the values at 0.1 intervals. By using these tables and conversion may be arrived at, no matter how many decimal figures are involved. Simply break the conversion up and add the separate parts.

Example : To convert 0.4299 cu. in. into c.c.

From the table, 0.42 cu. in. = 6.8826 c.c. 0.99 cu. in. = 16.2232 c.c. Therefore 0.0099 cu. in. = 0.162232 c.c. 0.4299 cu. in. = 0.42 + 0.0099 cu. in. = 6.8826 + 0.1622 c.c. = 7.0448 c.c.

CUBIC INCHES TO CUBIC CENTIMETRES

Cu. in.	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
—	—	0.16357	0.32774	0.491612	0.65548	0.81935	0.98322	1.14709	1.31097	1.47484
0.1	1.63871	1.80258	1.96645	2.1303	2.2942	2.4581	2.6219	2.7858	2.9497	3.1135
0.2	3.27741	3.44128	3.66515	3.7690	3 9329	4.0968	4.2606	4.4245	4.5884	4.7523
0.3	4.91612	5.0800	5.2430	5.4077	5.5716	5.7355	5.8993	6.0632	6.2271	6.3910
0.4	6.5548	6.7187	6.8826	7.0464	7.2103	7.3742	7.5380	7.7019	7.8658	8.0297
0.5	8.1935	8.3574	8.5213	8.6851	8.8490	9.0129	9.1768	9.3406	9.5045	9.6684
0.6	9.8322	9.9961	10.1600	10.3239	10.4877	10.6516	10.8155	10.9793	11.1432	11.3071
0.7	11.4709	11.6348	11.7957	11.9626	12.1264	12.2903	12.4542	12.6180	12.7810	12.9458
0.8	13.1097	13.2735	13.4374	13.6013	13.7651	13.9290	14.0929	14.2567	14.4206	14.5845
0.9	14 7484	14.9122	15.0761	15.2400	15.4038	15.5677	15.7316	15.8955	16.0593	16.2232
1.0	16.3871									

CUBIC CENTIMETRES TO CUBIC INCHES

c.c.	0.00	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
—	—	.006102	0.012205	0.018307	0.024410	0.030512	0.036614	0.002717	0.048819	0.05492
1	0.061024	0.067126	0 073228	0.079331	0.085433	0.091536	0.097638	0.103740	0.109843	0.115945
2	0.122047	0.128150	0.134252	0.140355	0.146457	0.152559	0.158662	0.164764	0.170866	0.176969
3	0.183071	0.189174	0.195276	0.201378	0.207481	0.213583	0.219685	0.225788	0.231890	0.237993
4	0.244095	0.250197	0.256300	0.262402	0.268504	0.274607	0.280709	0.286812	0.292914	0.299016
5	0.305119	0.311221	0.317323	0.323426	0.329528	0.335631	0.341733	0.347835	0.353938	0.360040
6	0.366142	0.372245	0.378347	0.384450	0.390552	0.396654	0.402757	0.408859	0.414961	0.421064
7	0.427166	0.433269	0.439371	0.445473	0.451576	0.457678	0.463780	0.469883	0.475985	0.482088
8	0.488190	0.494292	0.50039	0.50650	0.51260	0.51870	0.52480	0.53091	0.53701	0.54311
9	0.54921	0.55532	0.56142	0.56752	0.57362	0.57973	0.58583	0.59193	0.59803	0.60414
10	0.61024									

THE TYKE

(*Continued from page* 358)

untensioned length when it is run in. but you may get more on if you have got the strength.

Flying

Remove any warps in the steam from a kettle, and adjust the wing dowels so that the model balances at 50 per cent. of the wing chord. Try a few hand launch glides on a calm evening and move the wing back or forward as necessary. A little offset rudder and sidethrust should give a right turn on both climb and glide. The dethermaliser arrangement is shown on the plan. Get into the habit of using it every time.

MATERIALS REQUIRED

Strip :

12 x ⅛ in. x ¼ in. x 36 in.
2 x 3/16 in. x 3 16 in. x 36 in.
2 x ¼ in. x ⅜ in. x 36 in.
3 x ¼ in x ½ in. x 36 in.

Sheet :

1 x 1/32 in. x 3 in. x 36 in.
1 x ½ in. x 3 in. x 36 in.
1 x 6 in. x 3 in. x ½ in.
1 x 12 in. x 3 in. x 1/16 in.
1 x 8 in. x 3 in. x 1/16 in. plywood.

Miscellaneous :

36 in. x 16 s.w.g. wire.
2 in. x 18 s.w.g. wire.
2 x 16 s.w.g. brass bushes.
2 x 16 s.w.g. cup washers.
1 ballrace.
2 sheets lightweight modelspan.

Northern Notes

W. Nelson of Sheffield engaged in the popular (and prevalent) pastime of "Flick-a-Flick."

★ THIS MONTH we can properly get out the flags for the lads in the North, for in spite of officious officials, ferocious farmers and tardy timekeepers, the Northern Area has to its credit, thanks to the stout efforts of Bill "Glider" Farrance and Silvio "Kaiser" Lanfranchi, no less than three major trophies and a place on the International A/2 Team. Bill Farrance's efforts at the lower end of a tow-line have long been appreciated in the Area, his touch in trimming is masterly and his tow ups a joy to behold, whilst to mention the name of Silvio immediately brings to mind a well built, trimmed-to-the-last-second power job. Jolly good luck lads, and may even more pots come your way. We hear that Silvio is even more thrilled at being asked to manage the International Power Team on their jaunt to Switzerland this year. To my mind the council could not have chosen a better manager had they deliberated for a month, and let me tell you that the lads of the team are more than lucky guys to be able to travel under the wing of one of the best.

★ HAD A long talk the other day with that notorious character, the Fiddler himself, anent aeromodelling in general and fiddles in particular. He was right in the middle of sorting out the receipts of the Wakefield Draw, and I was pleased to hear him say that the lads in the Area have supported this event this year in a big way. The general total, whilst not so good as the first year, is better than that of last and the amount realised should be more than enough to get the four teams to their destinations, always supposing that the council don't buy another plane, (by the by, what has happened to the other two we own?) As usual many clubs ignored the draw completely, others returned all the books of tickets without a single sale, some sold out, and some did the best they could. A few members were very indignant that they should be asked to have a tanner's worth of fiddle, no matter what the object, and one lot of members demanded 20 per cent. commission for selling tickets. The best of all was one country member who said that the Society should stop bothering about international competitions and devote their time to other and better objects; needless to say this was another no sale merchant. Sam calculated that the draw had involved him in something like one hundred hours' work—no wonder he never gets any time to build a model.

★ MY NORTH WESTERN correspondent was not a little critical of the organisation of the Wakefield and A/2 finals, in his own words they were not held, they just happened. In defence of the officials responsible I would point out that the whole of the organisation and running of this meeting fell upon the shoulders of four or five willing but hard worked officials, plus the usual press-ganged timekeepers, and from what I saw of the events there was little to complain about. After all to get through six rounds of a hundred flights per round in something like five hours, and considering the remarkably high times recorded, I think the people concerned did very well. Someone complained that the processing was a farce. They did not know, of course, that spot checks were in force all day, and that leading models in each round were checked as well as the final top eight. Someone else thought that the method of fly-when-you-please resulted in a shambles; this, of course, in direct contrast to the gentleman, who, you will remember, wrote a remarkable letter to the columns of this magazine last year, neatly marshalling every possible objection to the fly-by-numbers principle. What was it somebody once said? "You can please some of the people some of the time, but anybody who can please aeromodellers at all should be Prime Minister."

★ OUR NORTHERN team member, Bill Farrance, needs no further mention beyond that already said, his three maximums were all well earned and he made no bones about the fly-off. John O'Donnell, the N.W. Area Wakefield team member, is one of those lads who deserves his success by reason of his perseverance and attention to the main principle of comp. winners, fly and trim, trim and fly at every possible (and sometimes almost impossible) moment. Perhaps the luckiest man of all was the ultimate Wakefield winner, Royle of the Littleover Club. He mislaid his model on the second flight, and was still searching within half an hour of closing time. In the meantime the model had been returned to control, and his son, who was already up with the leaders in the A/2, dashed off, dragged back his Dad just in time to make a perfect maximum. Royle's model is a wonder to watch; it hardly seems to have the strength to get up off the deck, but it seems to plod along in the right direction all the time, i.e., upwards.

★ THE LATEST howl of "Why weren't we told?" came after the Pay Load event on Whit Sunday, when it was learned that the first three prizes were gold wrist watches valued at over one hundred pounds. Don't blame the society for the lack of information, because the prizes only came to hand the day before the contest, and rumours that half the council sat up all night trying to build models in time are strictly false.

★ I HEAR that Barry Haisman is very interested in acquiring an ex W.D. Mark III Fusesetter. Price no object, but must be accurate.

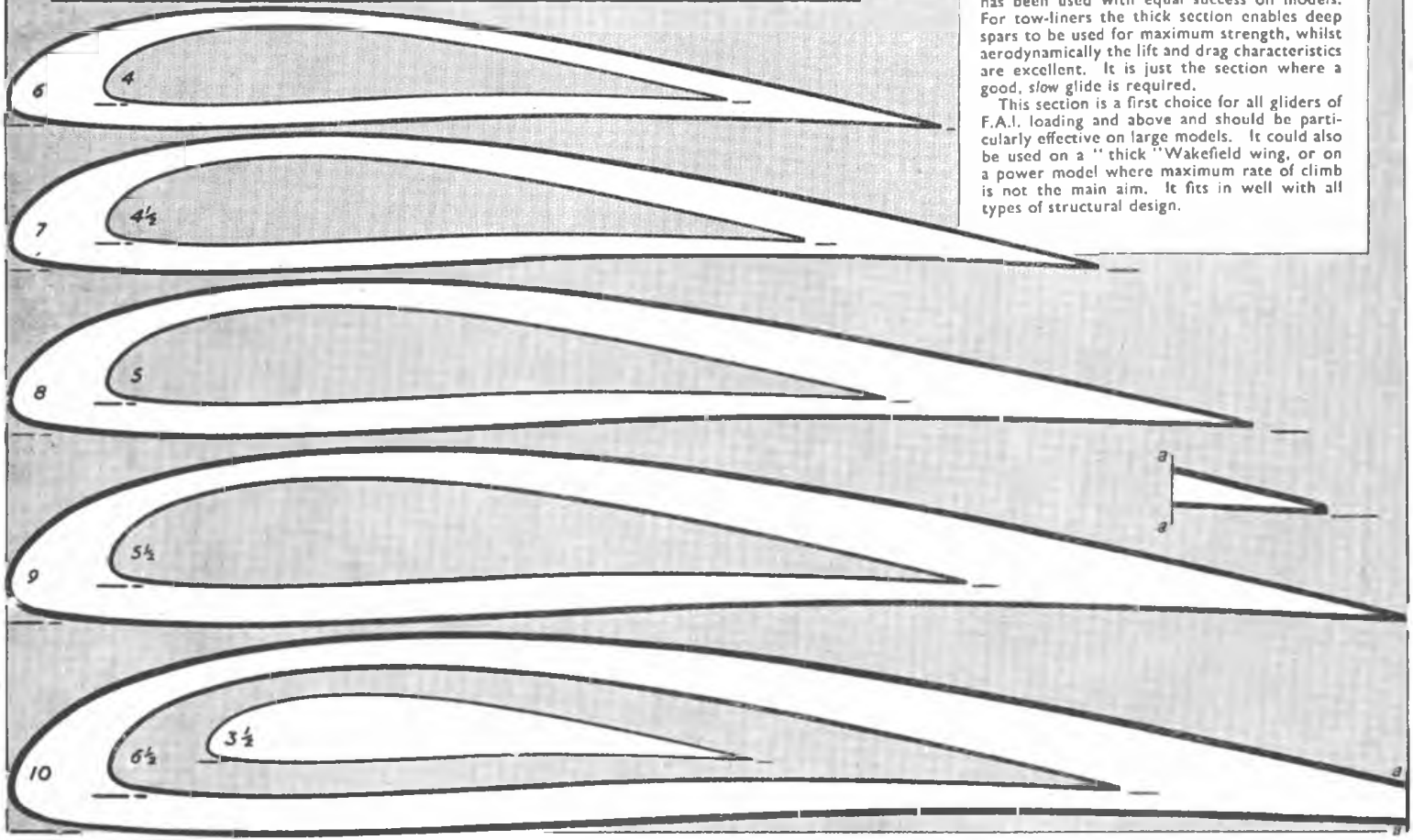
Seen at the recent N.A. meeting, a welcome return of an old timer, Norman Lees.

STATION	0	2·5	5	10	20	30	40	50	60	70	80	90	100
UPPER	2·45	7·05	8·55	10·55	12·25	12·75	12·05	10·70	9·00	7·10	4·90	2·60	0·10
LOWER	2·45	0·80	0·50	0·15	0·00	0·25	0·65	1·05	1·35	1·50	1·35	0·80	0·10

Göttingen 532

This is a famous full-size glider section which has been used with equal success on models. For tow-liners the thick section enables deep spars to be used for maximum strength, whilst aerodynamically the lift and drag characteristics are excellent. It is just the section where a good, *slow* glide is required.

This section is a first choice for all gliders of F.A.I. loading and above and should be particularly effective on large models. It could also be used on a " thick "Wakefield wing, or on a power model where maximum rate of climb is not the main aim. It fits in well with all types of structural design.



From the S.M.A.E. and the CLUBS

WEST OF SCOTLAND AREA

Thanks to the fine co-operation of White City stadium manager, Ian Hoskins, and streamlined organisation by area comp. secretary, Bill Meechan, 25,000 speedway fans at Glasgow, on May 25th, got a show that was inclined to put stink wheel racing in the shade. Flying men of Glasgow M.A.C., the Glasgow Barnstormers and Prestwick M.A.C. made full use of dead calm weather for a C/L stunt, racing and combat demonstration. A twenty-five minute interval didn't leave much time for flying off events concurrently, so the boys got three circles going simultaneously. At one end of the stadium Rab Colquhoun's *Ambassador* stuntster did the book, and then A. Bell and E. Perry dog-fought with a *Fokker D. VIII* and an *S.E.* [illegible]. At the other end, Bob Murdoch and Ian Clark did likewise with a *Spitfire* and an *F.W.* 190. This was fast and close, and probably stole the show. When the *Spitfire* came down to refuel Bob Murdoch kept the crowd on tip-toe by doing some natty zero feet inverted flying with the 190. After this flight, J. Clark put on an impressive display with an E.D. 2.46 stunt job. In the centre circle, Bob Parsons and Brian Harris, of Prestwick, raced Bill Chrystall and Tom Simpson of the Barnstormers. Bob flew his sleek Amco 3.5 powered job, Brian piloted Don Mitchell's Frog 500 model. On the Barnstormers' side, it was Ian Cochrane with Bill Chrystall's E.D. 3.46 racer, and Tom Simpson with Alec Clarke's Amco 3.5 job. The racing was fast and exciting once it got going, but baulking motors and awkward tufts of grass made it scrappy at times. Bill Chrystall's job toddled home first for the Barnstormers. When the team race finished, Eric Perry moved in with a Scottish Powell-sixty powered stunter. This model made more noise than three speedway bikes put together, and on its long-lines, manoeuvres were a joy to behold. The crowd gave the show a big hand, and the Area takes this opportunity to thank all clubs who helped to make the show such a success.

EAST ANGLIAN AREA

The eliminators for Power Wakefield and A/2, were held in very poor conditions, except the Weston and Astral days. The other two days consisted of high winds coupled with rain, both heavy and light. The outstanding points are noted under:

J. Hume (Belfairs) a junior member, placed second and third in the two A/2 eliminators, and topped the aggregated results.

D. Nichols (Southern Senior) gave the Ipswich duo of Gorham-Atkinson a run in the Wakefield, placing over Atkinson in the end.

G. Peek (Chelmsford) amazed all with the stable fast climb of his Elfin 2.49 *Jaded Maid* —he won both eliminators in the area.

Miss P. R. Healy (Belfairs) shook a good number of the lads by placing fourth in the first A/2 and tenth in the second—she just missed the trials.

The places in the trials were well divided, 5 to Belfairs, 3 to Clacton and Ipswich, 2 to Southend Senior and 1 to Chelmsford.

SCOTTISH SOUTH EAST AREA

Charities Model Show: Only three clubs entered the A & B team races at a show run for Edinburgh Students Charities Appeal, and every club took home a prize! Results were: Class A; Glasgow Barnstormers 1st, Glasgow M.A.C. 2nd, Class B: Glasgow M.A.C., 1st, Stirling 2nd.

Demonstrations of all types of C/L flying were given by Edinburgh members and guests. In particular we should like to mention the impeccable displays of stunt by Peter Russell (Stirling) and Adrian Joyce (Edinburgh), but undoubtedly the model that stole the show was Jock Wright's modified *Lancaster* (4 E.D. Racers).

Ideal conditions made the full-size air-show thoroughly enjoyable. 603 (City of Edinburgh) Auxiliary Squadron performed breath-taking aerobatics with jets, while the Varsity Air Squadron showed that *Chipmunks* are no mean stunters. Civil aircraft also took part, the most outstanding being the new Auster *Aiglet* trainer, brilliantly flown by the company's chief test pilot, Mr. Porteous. Territorial paratroops gave demonstration jumps throughout the afternoon, and took several members of E.M.F.C. aloft in the practice balloon next day.

Altogether the show was an example of how full-sized and model aircraft can combine to give the public an enjoyable time, even when an airfield is not available. Modellers and charities alike benefited by the subsequent publicity, and the convener, Bill Park, would like to thank all those who helped to stage the show.

Cowdenbeath. C.M.F.C. report some worthwhile activities, and some older clubs in the area would do well to hearken. The club's second exhibition was held in the Y.M.C.A. Hall on May 10th, and was opened by ex-Provost Maxwell, whom the club presented with a *Sabre* jet solid on a stand as a souvenir. The club are to be congratulated on such an ambitious show, from which only good publicity can come.

S.M.A.E. CONTESTS RESULTS

SUPER SCALE TROPHY

1. J. Bridgewood	Woodlands...	...	85.5
2. V. King ...	Thames Valley	...	53

AEROMODELLER TROPHY

1. S. Allen ...	West Essex	...	100
2. D. Allen ...	West Essex	...	50

SHORT TROPHY

1. P. Snodin ...	Northampton	...	3.34
2. R. H. Warring	Zombies ...	...	3.31
3. I. C. Lucas ...	Brighton ...	...	3.28

INTERNATIONAL POWER TRIALS

1. P. Buskell	Surbiton ...	...	11.50
2. R. C. Monks	Birmingham	....	10.02
3. R. J. North ...	Croydon ...	...	8.04
4. G. Byrd	Loughboro Coll.	...	7.03

NORDIC A2 "100"

1. W. Farrance	West Yorks	...	15.00
2. M. A. King	Belfairs ...	...	15.00
3. G. M. Byrd ...	Loughboro Coll.	...	15.00
4. P. J. Royle ...	R.A.F. St. Mawgan...		15.00

WAKEFIELD "100"

1. J. Royle	Littleover ...	...	15.00
2. R. Nicole	W. Middlesex	...	14.20
3. R. H. Warring	Zombies	...	13.22
4. J. O'Donnell	Whitefield ...	...	13.22
5. A. G. Albone	Croydon	...	13.22
6. T Dunkley ...	Northampton	...	13.19
7. E. W. Evans	Northampton	....	12.56

As A. G. Albone is unable to travel to Sweden his place in the Wakefield team will be taken by E. W. Evans.

On May 25th members visited Glenlomond Sanatorium and put on demonstrations of rubber and C/L flying, which were very well received by patients and staff. Afterwards gifts of fruit and sweets from the club and six kits donated by Mr. J. Reid were distributed among the patients—a very generous gesture indeed. Replying to the Matron's thanks, Mr. Brown (club pres.) said that the show was very satisfying and that the club was amply repaid by the enthusiasm of the younger patients. How about other clubs trying this? Most hospitals have grounds suitable for flying, or you might even manage some indoor stuff. Admittedly, the noise factor might be unwelcome sometimes, but there's no harm in asking. And in case you think you will be too busy preparing for comps., we can tell you right now that Cowdenbeath is finding time to build for most of the rallies.

Group of Southport competitors in the Halfax Trophy at Tilstock Aerodrome. They are Charlie Fitzpatrick, Harold Griffiths, Geoff Briggs, Bill Lewis, and Tom Nelson.

N.W. MIDDLESEX M.F.C.

The club are pleased to say that they beat Upton Park in the third round of the L.D.I.C.C., at Fairlop, on Sunday, May 25th. The weather was good and several maximums were put up, but both clubs only managed 11 out of the 12 possible flights, due to losses and prangs. However, both clubs scored over 1,800 sec., the Thermaleers winning by a minute and a few odd seconds. One of the juniors, Ronnie Bowker, has been showing the seniors how to fly a Wakefield. He placed 10th in the Weston and after a mad scramble to Digby on a motor bike on Sunday morning, flew in the "100."

WHITEFIELD M.A.C.

The club have had a considerable amount of success in S.M.A.E. contests recently. In the D/C contest for the Keil Trophy (power ratio), A. D. Bennett placed first with an agg. ratio of 66, while R. Woodhouse was fourth with 52 ratio.

In the area contests on May 11th, H. O'Donnell won the K.M.A.A. Cup with 13 min. 29 sec. agg., flying a very high A.R. design. Second place was secured by R. Askew, with 11 min. 55 sec., flying a long stick Nordic for two flights and a *Revenge* for the third.

In the trials at Digby, on June 8th, J. O'Donnell secured a place on the Wakefield team—tieing for third place with 13 min. 22 sec. agg. Flights of 4 min. 32 sec., 4 min. 20 sec., and 4 min. 30 sec. proved the value of much early morning and late night trimming. Two models were used as one was lost on the second flight—both being diamond pylons, feathering prop designs.

STOCKTON & DISTRICT M.F.C.

The weather at the last area meeting was not to the liking of the majority of our A/2 exponents but this did not prevent Ian Mawson gaining a place in the A/2 "100" and also a chance of competing in the British Championships.

Ian and Ernie Harrison travelled on motorcycles to Digby where Ian, although scoring a maximum on the first flight suffered from the effects of a down-draught and a premature D.T. on his second and third attempts. Despite these misfortunes, the boys had quite an enjoyable stay and are full of accounts on:—Warring's and Evans' Wakefields, the ultra long fuselaged A/2's and—the N.A.A.F.I. waitresses ! !

AEROBODS OF NOTE

No. 5
J. L. PITCHER

Wearing his famous cap, J. L. Pitcher is a familiar figure on the contest field. Preferring the Wakefield type model, he was a member of the 1950 British Wakefield Team.

YORK M.A.S.

York succeeded in defeating Sheffield & District M.E.E. in the first round of the Northern Area Knockout Comp., at Blackamoor, on May 25th. High winds and lost models were the order of the day and no spectacular times were achieved. A word of thanks to the Sheffield "bods" for their generous assistance in transporting the York team to the flying field.

Conditions at Rufforth for the Wakefield and A/2 Eliminators were pretty grim but Harold Budding managed to qualify for the "100," Ron Firth, "Copper" Brown and Arthur Wharrie also made the grade for the A/2, and visited Digby for the trials. None of them reached the top time brackets but nevertheless all put up a creditable performance. Harold Budding being well to the fore in the Northern Area contingent.

WEST YORKSHIRE M.A.C.

Although handicapped by what must surely be the worst flying ground in the country, we have had a very good season to date. W. Farrance has won both the S.M.A.E. and *Aeromodeller* trophies with his original *Hellios* A/2, and we have also had high placings from Ernie Farrance (gliders) and Geoff Illingworth (power). Geoff's model is an Elfin 1.49 c.c. *Blythe Spirit*, another Farrance design, and both these models are built as standard by our members.

Our lone radio man, Ken Lees, seems to have got the business taped this year and has three models, *Junior* 60 (Elfin), *Falcon* (McCoy) and *Stentorian* (Ensign 10 c.c.) performing beautifully.

We flew the first round of the Area Knock-Out against Huddersfield M.A.C. away, and only managed a win by a very narrow margin due to a last minute flight by Jack Hepworth, which just turned the tables. The keynote here seemed to be hospitality, and the Huddersfield lads even laid meat and drink on for us (literally). Thanks Huddersfield for a very happy day !

Our membership, in spite of our efforts, has now dropped to about 20, of whom only a dozen are keen fliers. This is about a third of what we had in 1948, so if any lone hands in the Dewsbury, Batley, Heckmondwike area read this, roll up, and you will be more than welcome.

One encouraging sign however, is that our half-dozen juniors are already making the grade, and competition for our junior trophy looks like developing into a real battle.

For the benefit of any intending members, meetings are held every first and third Friday evenings of the month, at the Victoria Central School, Wellington Road, Dewsbury.

HENLEY M.C.

The Henley members were again successful at the third South Midland Area meeting, held at Henlow, Beds. R. F. Sandy won the Wakefield event, flying his new own design "long" fuselage Wakefield model to score 8 min. 40 sec. with only two flights, and A. W. M. Cooke placed fourth, scoring 5 min. 52 sec. Sandy's "long" fuselage model astounded many of the onlookers with its very fast, steep climb, and has been appropriately called *Dragonfly*, closely resembling this insect with its long tail. These two members qualified for the Wakefield "100," Cooke placing first and Sandy third in the combined trials results.

We are naturally very pleased to hear that our club secretary, F. G. Waldron, has placed third in the National results for the Halfax, and as power flying was our weakest link, we hope this will give it a much needed boost ! Waldron flew an Elfin 2.49 c.c. powered *Contender* at 12¼ oz. all-up weight, but has now installed an Amco 3.5 c.c. diesel, giving all up weight of 13¼ oz.

HATFIELD M.A.C.

The club having changed to the South

A/2C Al. West pumps to start the Swiss jet engine on A/2C Cecil P. Pentecost's model at the U.S.A.F. Championships at Wiesbaden.

Midland Area, club members have attended competitions at Kidlington and Henlow.

J. Frazer having put up good times in the Wakefield Eliminators, passed on to the Wakefield "100."

Junior membership has climbed steadily in the last few weeks to a total of 22, many of whom are showing promise in rubber and glider.

Through the kindness of a local tradesman and club member, the club now possesses two further cups, thus bringing their total up sufficiently to cover glider, rubber, power and junior contests. The first takes place on June 22nd, and is for rubber.

To increase the competitive spirit in the club, we have now divided it up into two teams, points being gained in area, national and club competitions.

CARDIFF M.A.C.

Sunday, May 25th, saw a hurriedly organised "scramble" in progress at Ely Racecourse.

A maximum flight of two minutes and a minimum of 20 sec. were imposed, flights over 2 min. being "no score."

P. Persen won the event, his Nordic aggregating 13 min. 42 sec. in the ½ hr. allowed, making thirteen flights. Other entries were washed out by an all-powerful thermal which took four models away at once ! Glider men worked hard in a constantly changing breeze, some entrants using pulleys to get the 23 jobs up.

The most useful advice we can give to other people who may be contemplating similar events is that they should be held on nice cold days—*not* in the heat of a summer afternoon ! Several entries were eliminated by sheer exhaustion !

SURBITON & D. M.A.C.

We wish to announce that our glider gala which we had to cancel due to snow will now be run on October 5th.

Our first win of the season was at Croydon gala when Don Butler topped the glider event with an aggregate of 14 min. 15 sec., using a long fuselage development of his *Jader* 60.

After beating the Park M.A.L. boys by 44 min. 25 sec. to 35 min. 40 sec. in the first round of the L.D.I.C.C., we had the positions reversed in the second round by our old rivals, Croydon, who knocked us out by 47 min. 8 sec. to our 38 min. 20 sec.

Having got Allaker and Buskell in the Wakefield "100" and Smeed, Hancock,

Barks and Butler in the A/2 eliminators, we had high hopes, but it was not to be; dear old Dighy produced as many down draughts as up, though Jeff Hancock nearly did it, with Mr. Barks running him a close second.

Pete Huskell, after a bad start, has finally found his old form and has flown himself into the international power team, putting up top times in the eliminators.

HAYES & DISTRICT M.A.C.

The club gathered in three tents to face Northern Heights M.F.C. in between the showers at Fairlop on Whit Sunday to fly off the second round of the London Area K.O. team contest. After a dour struggle in which each team lost a model and many hectic repairs were carried out, the results were totted up to give us a win of 191 sec. over our worthy hosts.

The most important jobs of the day were carried out by the retrieving squads and it was here that the Hayes motor-cyclists proved their superiority over the N.H. cars.

Jim Murison deserted his autogyros to test out his first R/C job, a 4 lb. *Junior* 60, with Frog 500. He had the horrible experience of watching it disappear in the direction of Harrow, high up in a strong riser. Further news of it is still anxiously awaited.

Wally Callender has been looking sadly at his magnificent 12 ft. 6 in. span glider for the last two seasons and wondering how to get it out to the flying field whole!

After attempts to sell it on site had failed, he was heard sawing it up into seven handy pieces!

CROYDON & D. M.A.C.

Congratulations to our "dark horse," Mr. Albone, who after only two years of Wakefield experience, managed to get into this year's team. After a mediocre first flight of 3 min. 24 sec., he turned up trumps on his last two with maximums. Mr. Albone belongs to the freewheeler, two leg undercarriage brigade, but the lads are still convinced that folders are the best.

N. Marcus and E. Bennett both did 5 min. on their first flights, but poor second flights spoilt their chances. Mr. Pitcher managed about 12 min. total.

This is the third international team that Norman Marcus – he came 8th with 12 min. 47 sec.—has just missed by those few vital seconds.

The A/2 glider trials was a slightly sadder tale, with Roy Yeabsley—the only one who persevered—managing two maximums with his new design.

We must congratulate the S.M.A.E. on *not* being able to procure a public address system—this allowed the contests to proceed in a quiet and efficient manner!

Fred Massey, with the winning Grimsby team race model, explains the finer points to S/Ldr. R. E. Lewis D.F.C., entertainments manager at Skegness Holiday Camp.

EDINBURGH M.F.C.

Indoor Demonstrations. Club members gave a number of C/L displays, totalling 9 hours in all, at the Festival of Sport in the Waverley Market, Edinburgh. As the two weeks' show drew to a close it was noticeable that fewer models were appearing and that the better-built and finished aircraft stood up more to rough landings, etc., than did the others. A Mercury *Midge* was flown on 14 ft. lines (as were all models!) to the amazement of spectators, but a daring attempt to loop a stunt model met with failure owing to low rafters. This lack of room produced some novel ideas to replace normal stunting, e.g., balloon bursting, streamer cutting, glider pick-up, and flying through paper hoops, all of which were done successfully.

WALLASEY M.A.C.

A coachful of club members enjoyed a good day at Tilstock on May 4th, the weather turning out nearly perfect.

In the Keil Trophy event the top club ratios were 33.18, 26.95 and 22 turned in by Ces. Calkin, George Davies, and Stan Hinds respectively.

Unfortunately the weather put paid to the hopes of our glider boys at the second round of the A/2 eliminators, held the following week on May 11th, high winds and intermittent rain persisting most of the day.

Our team race crew, Messrs. Pumford, Alexander and Godwin are now practising hard for forthcoming events. Flying a modified *Lazy Daisy* with an E.D. 2.46, and using Roy Alexander's patent fuel brew, their speeds are well up in the 70 m.p.h. region, flying 50 laps before re-fuelling.

THE ENFIELD AND D. M.A.C.

The club power duration record was broken at Fairlop during the Easter holiday by Mr. R. Dudley, flying a *Mallard*, his time was 12 min. 57.6 sec. on a 10 sec. engine run—a ratio of 77.76, which we think is going to remain unbroken for a long time.

Our "Bainbridge Trophy" contest was won this year by Mr Mike Brown, with a Wakefield of his own design. His time for a total of three flights was 8 min. 17.3 sec. This trophy was presented in April, 1945, by Mr. Bainbridge, a late club member.

A successful auction was held in the clubroom on May 19th, to raise funds for a club tent. The useful amount of £5 5s. 0d. was collected in this manner. The committee has yet to decide whether one large tent or two small ones will be more suitable.

The club meets every Monday evening at "The George Spicer School," Southbury Road, Enfield, but when the weather is suitable, we hold a flying session on the local playing field, which by arrangement with the Enfield Council is the club flying ground.

CHESTER M.F.C.

Our annual C/L Rodeo, sponsored by the Chester Autumn Sports Committee, will again be held on August Bank Holiday, at Chester Racecourse.

Our open power event for the Hammond Trophy produced some good flying under perfect conditions.

The power record previously held by our president, Mr. R. W. Milton, was broken twice, first by F. Hammond, whose *Hell's Angel* clocked over 8 min., and later by F. Dodd, with a *Slicker* "50" fitted with his A/2 glider wing, which combination stayed aloft for some 24 min. and landed only half a mile away.

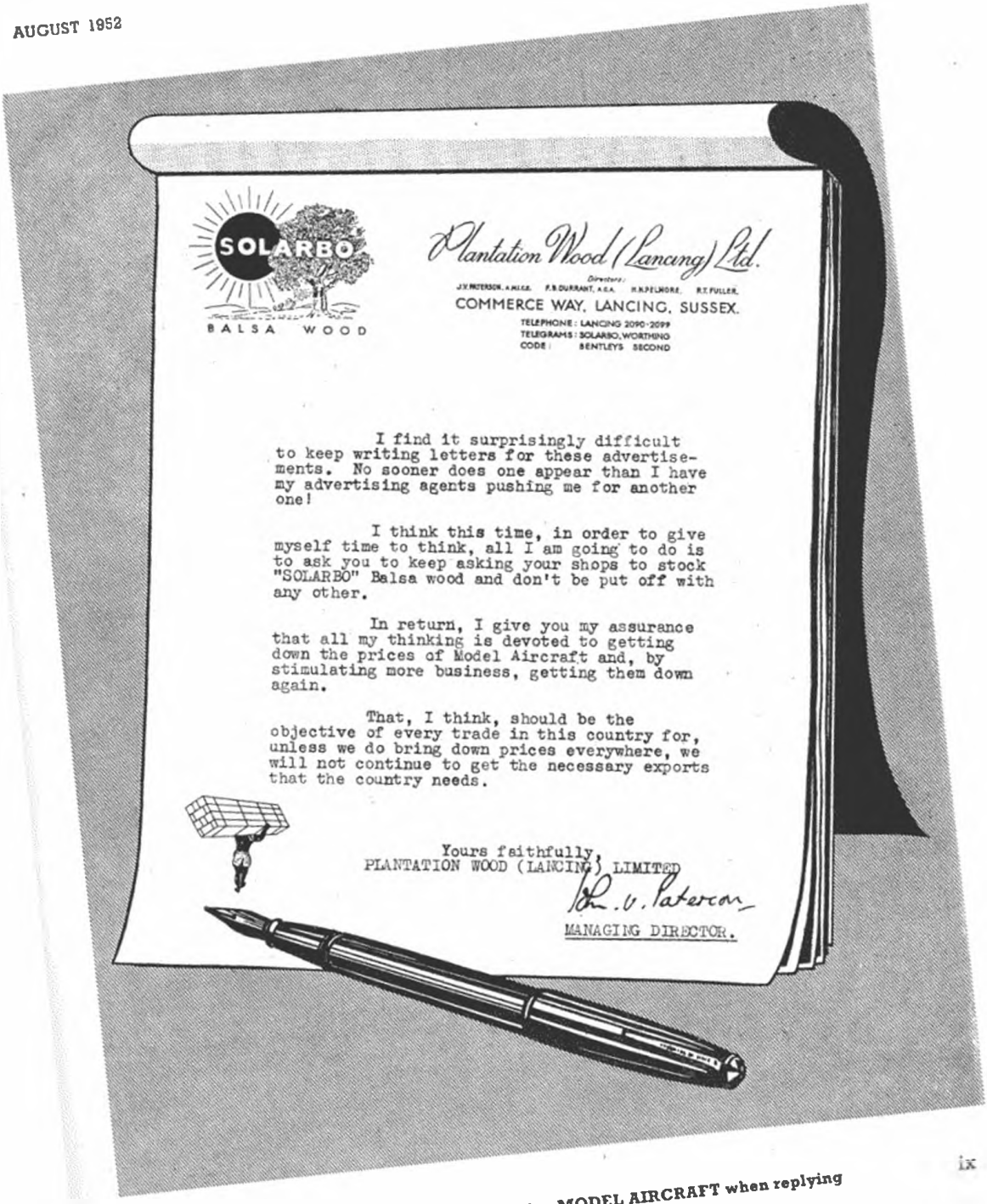
This placed Frank well in the lead but conditions were such that the issue was in doubt up to the last few flights.

MODEL AIRCRAFT CONTEST CALENDAR

THE BRITISH NATIONALS. R.N. Air Station, Gosport, Hants.

Aug. 3rd† **"MODEL AIRCRAFT" TROPHY.** Unrestricted Rubber.
" 3rd **THURSTON CUP.** Unrestricted Glider.
" 3rd **"GOLD" TROPHY.** Control-Line Stunt.
" 3rd **Class "A" Team Race.**
" 3rd & 4th **S.M.A.E. R/C TROPHY.** Radio Control.
" 3rd & 4th **CONTROL-LINE SPEED CONTESTS.**
" 4th **SIR JOHN SHELLEY CUP.** Power Duration.
" 4th **Class "B" Team Race.**
" 10th **Swindon M.A.C. Slope Soaring Meeting.** Wiltshire Downs.
" 10th **Belgium v. Gt. Britain C/L Challenge Contest.** Nemur, Belgium.
" 13th-17th **Swedish A/2 Glider Cup.** Graz, Austria.
" 24th **All-Herts Rally.** Radlett Aerodrome, Herts.
" 24th **Irish International Meeting.** Baldonnel Airport, Dublin.
" 24th **Bolton M.A.S. Rally,** Edgworth, Lancs.
Aug. 31st **BRITISH CHAMPIONSHIPS and TAPLIN TROPHY.** Radio Control. Cranfield Aerodrome, Beds.
" 31st **"Daily Dispatch" Rally.** Woodford Aerodrome, Ches.
Sept. 6th & 7th **Royal Air Force Championships.**
" 7th **"Yorkshire Evening News" Flying Festival.** Sherburn, Yorks.
" 14th **World Power Championships.** Switzerland.
" 14th **U.K. CHALLENGE MATCH.** Rubber/Glider/Power. Tilstock Aerodrome, Lancs. 14th Cambridge Team Race Rally, Coleridge Rd.
" 21st **Butlin's Contests.** Filey, Ayr, Pwllheli and Skegness. All classes of events
" 21st **Southern Counties Rally,** Thorney Island, Hants.
" 28th **"THE MODEL ENGINEER" CUP.** Team Glider. Area.
" 28th **"FROG" SENIOR CUP.** 1.5 c.c. Power Duration. Area.
" 28th **South Midland Area Rally.** Halton Aerodrome, Bucks.
Oct. 12th **RIPMAX TROPHY.** Radio Control.
" 12th **DAVIES TROPHY.** Team Race.
" 12th **CONTROL-LINE SPEED CONTESTS.** Centralised—Venue to be announced.

S.M.A.E. CONTESTS IN CAPITALS



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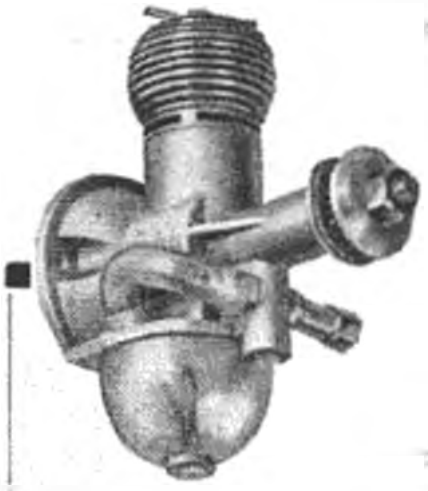

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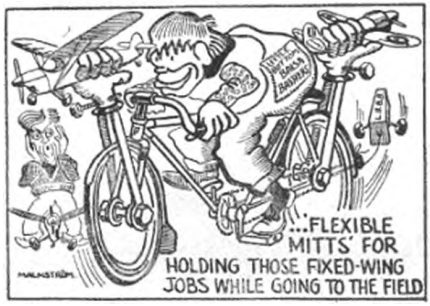

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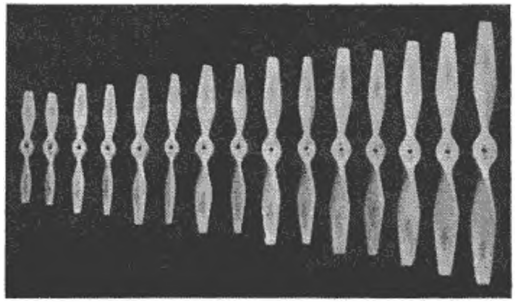

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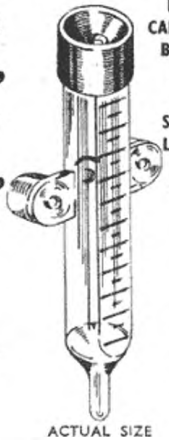

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68

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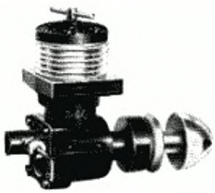

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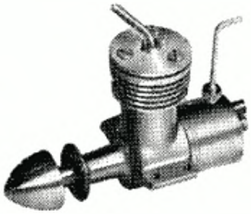

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