

Aero Modeller

INCORPORATING
MODEL AIRCRAFT

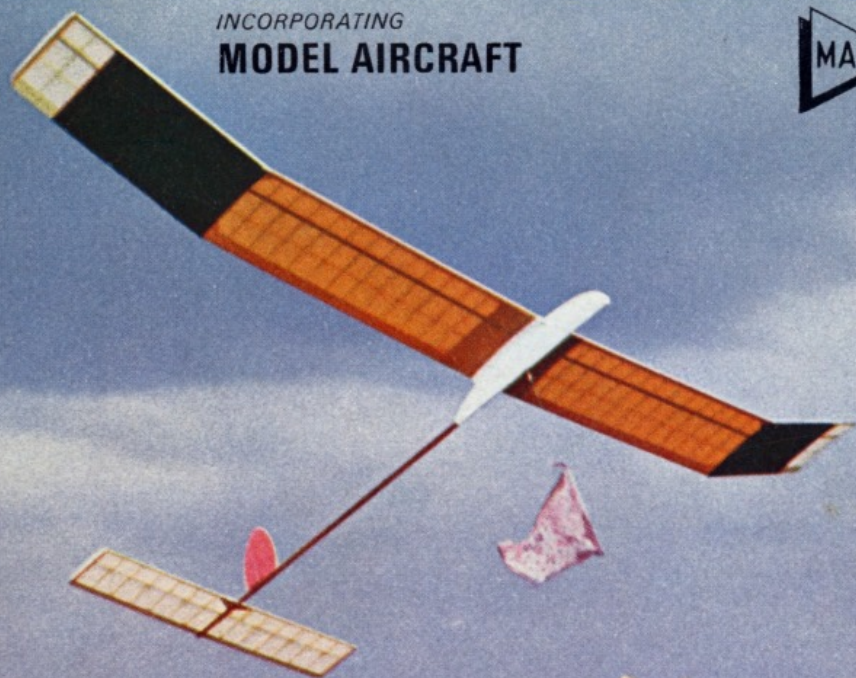
September 1973

15p

USA & Canada 75c.



HOBBY MAGAZINE



SPEED FLYING

AIRSCREWS EN MASSE

MITSUBISHI ZERO PLANS

THE NEW **RAPID**

QUICKSTART

**QUALITY ENGINEERED
2.5 cc DIESEL**
with outstanding
new features

REAR DISC INDUCTION
TWIN BALL RACE SHAFT
RADIO CONTROL THROTTLE OPTION
DESIGNED FOR HIGH POWER
PLUS SOUND RESTRICTION

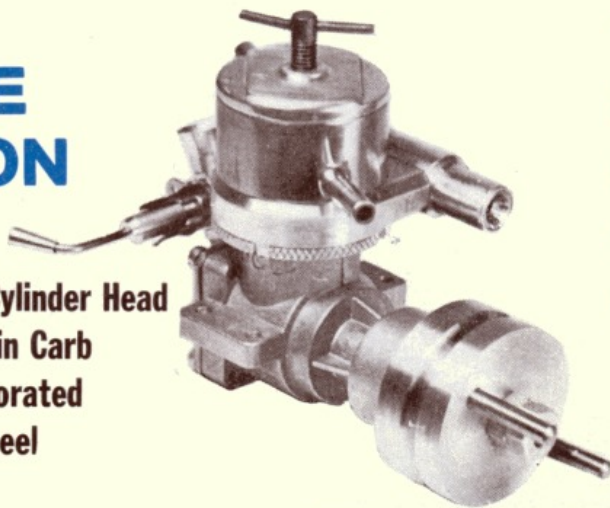
The Motor for the Modern Modeller!



- NEW Lightweight Piston
- NEW Cylinder Porting
- NEW Integral Silencer Unit
- NEW Shaft Bearing Design

MARINE VERSION

- Water-cooled Cylinder Head
- Throttle or Plain Carb
- Silencer Incorporated
- Balanced Flywheel



**Tried and tested,
backed by full
spares service
and years of
diesel 'know-how'**

PRICES

Std. AERO	£8.25 +	83p VAT
R/C AERO	£9.50 +	95p VAT
Std. MARINE	£10.50 +	£1.05 VAT
R/C MARINE	£11.75 +	£1.18 VAT

DAVIES-CHARLTON LTD

**Hills Meadow
Douglas, Isle of Man**

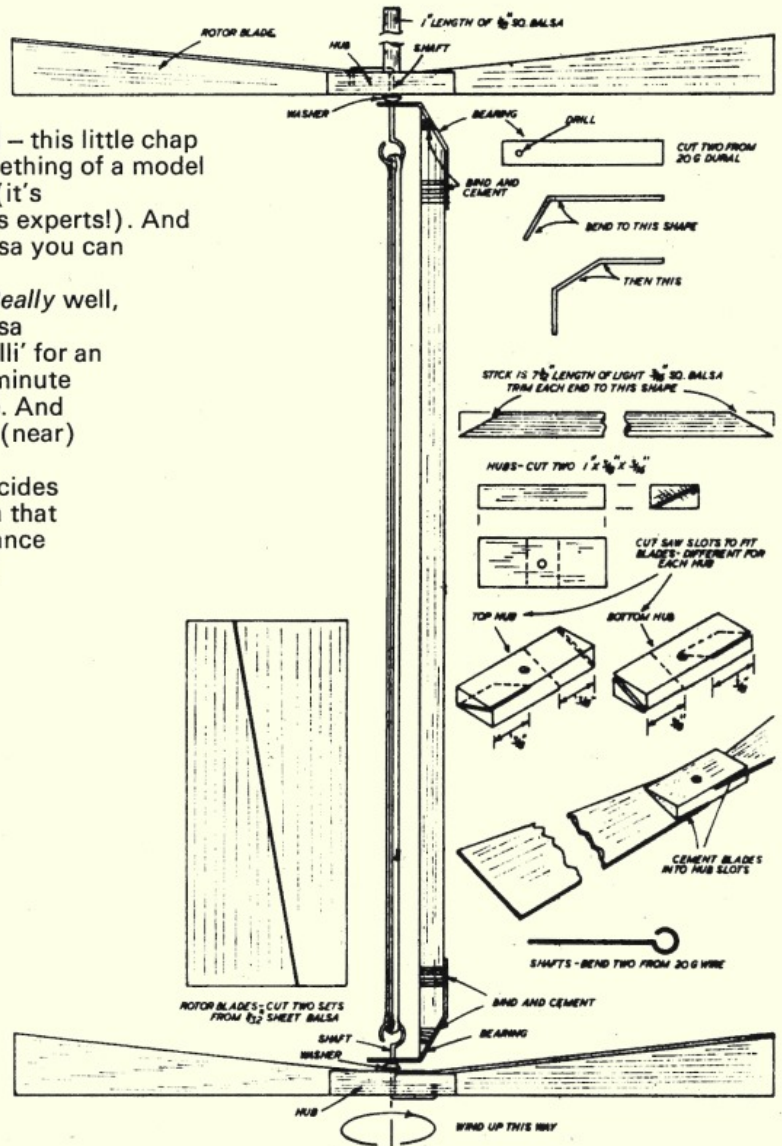
SOLARBO

Helicopters again this month? Well – this little chap is all-Balsa. You don't have to be something of a model engineering genius to put it together (it's recommended for beginners as well as experts!). And the cost is fractional (most of the Balsa you can find in your scrap stock).

On top of that, it flies pretty well. *Really* well, in fact, if you take extra care over Balsa selection – and strip down some 'Pirelli' for an optimum motor size. Try to beat the minute mark in your living room. It's possible. And we've even used the same design for (near) horizontal speed flying outdoors!

It's the rubber motor that finally decides the performance – but Balsa selection that really governs how good the performance can be. This little model is a practical demonstration of that basic rule of aeromodelling.

It's the same with any type of model. However good the design, the top performance realisable really depends on the quality of construction. That's why you need to use quality Balsa throughout. That means Solarbo Balsa – every time. Quality guaranteed! Every piece!



THE HOME OF
GOOD Balsa

SOLARBO
LIMITED

COMMERCE WAY
LANCING SUSSEX

ALWAYS ASK FOR
'SOLARBO' BY NAME

KINDLY MENTION 'AEROMODELLER' WHEN REPLYING TO ADVERTISEMENTS

Buy and Fly the Best...

VERON

A VINTAGE YEAR FOR VETERANS!

FIRST THE HAWKER TOMTIT, THEN THE FOKKER D.VIII

48" SPAN (1220 mm)

AND NOW THE SOPWITH 1½ STRUTTER

'VERY-NEAR-TO-SCALE'

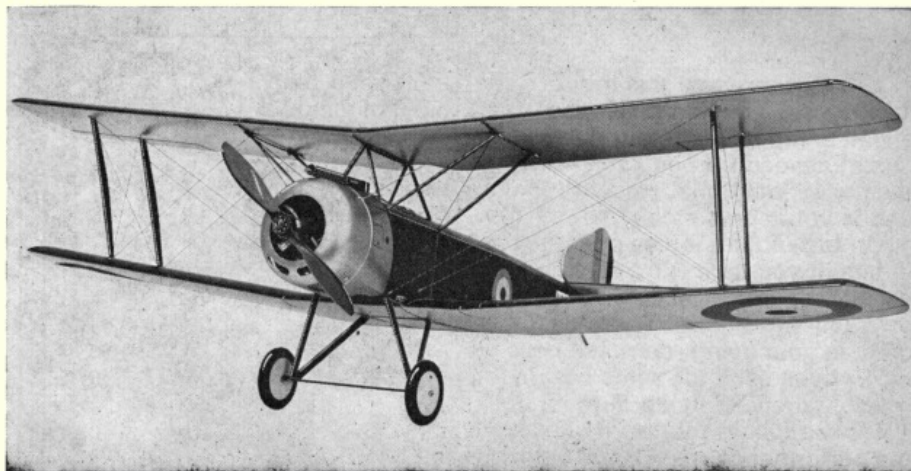
Circa 1916-18

ISN'T SHE A BEAUTY?

Photo of our Prototype Model fitted with 2 Channel Proportional on Rudder & Elevator only (optional 3 on Motor), powered with a 3.44 c.c. 'GLOW-STAR' with Silencer.

KIT PRICE £13.85

For 2.5 to 3.5 c.c. (.15 to .19 cu. in.) A.B.S. Vacuum Formed Cowl, Semi-pneumatic Vintage Wheels, Vinyl Decals, Superlative Die-cutting, Preformed Wire Strutting & Super Kitting.



FOKKER D.VIII

For 1.5 c.c. (.09 cu. in.) Diesel or Glow motors with rudder only (Single Channel or One Prop), or up to 2.5 c.c. (.15 cu. in.) with 2-Channel Prop on Rudder & Elevator. Also suitable for Free-Flight with 1 c.c.

KIT PRICE

£9.16

46" SPAN
(1168 mm)

THE SOPWITH REQUIRES 2-CHANNEL PROPO, BUT THE FOKKER FLIES BEAUTIFULLY ON SINGLE PROPO!



IDEAL FOR
TAIPAN 'TYRO'
1.8 c.c. DIESEL
£6.47
Silencer 78p

Very-near-to-scale (Class 2)
Vintage W.W.I Single Seat
Fighter. Circa 1917/18. Kit complete with A.B.S. Cowl & Vintage
Wheels.

LATEST PRICES FOR OUR RADIO CONTROL KIT RANGE

HAWKER TOMTIT...	£21.22	BIG EAGLE	£12.31
CESSNA SKYLANE	£9.16	IMPALA	£5.63
FOURNIER R.F.5	£11.72	SPRINGBOK	£8.67
CHEROKEE	£17.23	ROBOT	£7.02

ALL PRICES SHOWN ARE RETAIL RECOMMENDED INCLUDING V.A.T.



ENGINES

STANDARD & R.C.

NEW! - NEW! - NEW! - NEW!

FOX 19 (11900) 3.5 c.c. ... **£4.92**

FOX 19 R.C. (21900) 3.5 c.c. ... **£7.57**

FOX SILENCER **£1.88**

COMPLETE RANGE OF ECONOMY PRICED MOTORS, ACCESSORIES, SILENCERS, SPARES & GLOW-PLUGS.

11500 Fox 15	2.5 c.c.	£4.16
12500 Fox 25	4.1 c.c.	£4.92
12900 Fox 29	5.0 c.c.	£5.67
13500 Fox 35	5.9 c.c.	£6.42
13600 Fox 36	6.0 c.c.	£5.67
14000 Fox 40	6.6 c.c.	£7.19
16000 Fox 60	10.0 c.c.	£9.46
21500 Fox 15RC	2.5 c.c.	£6.05
22500 Fox 25RC	4.1 c.c.	£7.57
22900 Fox 29RC	5.0 c.c.	£9.10
23600 Fox 36RC	6.0 c.c.	£9.10
2400 Fox 40RC	6.6 c.c.	£9.85
2600 Fox 60-C	10.0 c.c.	£13.24
26099 Fox 60RC	10.0 c.c.	£18.95

**QUALITY AND ECONOMY PRICE
- FROM YOUR LOCAL DEALER!**



MODEL AIRCRAFT (Bournemouth) LTD., NORWOOD PLACE, BOURNEMOUTH

Canada: Academy Products, 51 Millwick Drive, Weston, Ontario, Canada
Australia: Pizzev Ltd., 1 Clark Street, Richmond, Melbourne, Australia
Holland: Model Engineering, Ezenlaan 45, Hilversum, Holland
Italy: Luigi Vayr, Via Cassini 75, 10129 Torino, Italy
Belgium: Ets. M. De Prest, Rue Vanderstichelen 62-64, B-1020 Brussels, Belgium
France: Scientific-France, 25 Rue de Mons, 59 Avnes-Sur-Meipe, France
Germany: Fein und Modelltechnik, Martin Eberth, 1 Berlin 36, Oranienstrasse 6, W. Germany
Sweden: S. Beckman & Co. AB, Wollmar Yxkullsgatan 1, S-116 50 Stockholm, Sweden

KINDLY MENTION 'AEROMODELLER' WHEN REPLYING TO ADVERTISEMENTS

Aero Modeller

INCORPORATING
MODEL AIRCRAFT

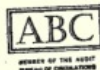
September 1973
CONTENTS

Volume XXXVIII No. 452

HANGAR DOORS	481
'MITSUBISHI ZERO'	482
FLYING SCALE COLUMN	484
AIRCRAFT DESCRIBED - RFB (Lippisch) X-113 Am	488
LATEST ENGINE NEWS	491
AIRSCREWS EN MASSE	494
FLY SPEED	496
GLASS REINFORCED PLASTICS	501
CONTROL LINE NEWS	504
FREE-FLIGHT COMMENT	506
TOPICAL TWISTS	510
CLUB NEWS	511
CONTEST CALENDAR	513



HOBBY MAGAZINE



ALSO MODEL BOATS · RADIO CONTROL
MODELS & ELECTRONICS · MODEL ENGINEER
MODEL RAILWAYS · SCALE MODELS · WOOD-
WORKER and MILITARY MODELLING

This periodical is sold subject to the following conditions that it shall not, without the written consent of the publishers, be lent, re-sold, hired out or otherwise disposed of by way of the Trade (except at the full retail price of 15p or 75 cents and that it shall not be lent, re-sold, hired out or otherwise disposed of in a mutilated condition or in any unauthorised cover by way of Trade, or affixed to or as part of any publication of advertising, literary, or pictorial matter whatsoever.

Second-class postage rates paid at New York, N.Y. Registered at the G.P.O. for transmission by Canadian Post. American inquiries regarding subscriptions, news stand sales and advertising should be sent to AERO MODELLER, Eastern News Distributors Inc., 155 West 15th Street, New York, N.Y. 10011 U.S.A. Inquiries regarding distribution to the Model & Hobby trade in the U.S.A. to associated Hobby Manufacturers Inc., 621 East Cayuga St., Philadelphia, PA 19120 U.S.A.

Advertisement Offices: Model & Allied Publications Ltd., P.O. Box 35, Bridge Street, Hemel Hempstead, Hertfordshire HP1 1EE. Tel: Hemel Hempstead 5611/.

Subscription Department: Remittances to Model & Allied Publications Ltd., P.O. Box 35, Bridge Street, Hemel Hempstead, Herts HP1 1EE (subscription queries Tel. Kings Langley 62692/3). Direct subscription rate £3.00 per annum, including December edition and index, \$8 (U.S.) for overseas subscribers.

CORRESPONDENCE anticipating a reply must be accompanied by a stamped and self-addressed envelope or international reply coupon. While every care is taken, no responsibility can be accepted for unsolicited manuscripts, photographs or artwork, etc. News reports should be submitted to arrive not later than the 15th of each month for publication in the next immediate issue. Photographs should be accompanied by negatives where possible and can only be accepted for use on an exclusive basis for British Copyright. AERO MODELLER incorporates the MODEL AEROPLANE CONSTRUCTOR and MODEL AIRCRAFT and is published on the third Friday of each month prior to date of publication by:

MODEL & ALLIED PUBLICATIONS LTD.

P.O. BOX 35, BRIDGE STREET, HEHEL HEMPSTEAD, HERTS HP1 1EE

Tel.: Hemel Hempstead 2501-2-3 (Mon.-Fri.)

Editorial Director D. J. LAIDLAW-DICKSON

Managing Editor R. G. MOULTON

EDITOR P. S. RICHARDSON

COMMENT

World trading trends, with the tumbling U.S. Dollar and Pound Sterling affecting costs of all imported goods, will have their effect on the British Model market. Never was the time more opportune for the British manufacturer. We appear to be heading for the situation which existed for Japan ten years ago with low domestic prices made attractive to the overseas buyer. But will the opportunity be taken up? Do we have the competitive products? That is the burning question, and one which can only be resolved by new approaches in the research and development departments of our model kit, engine and accessory manufacturers. Meanwhile, take note that prices quoted for some imported items in advertisements in this issue will be subject to increase.

on the cover

Although an assistant is a useful 'accessory' when flying gliders, they are not essential, as Tony Cordes demonstrates, solo-launching his large 97 in. wingspan 'Big Dad' open class glider which was featured in the July '73 issue of this magazine. Photograph by John O'Donnell.

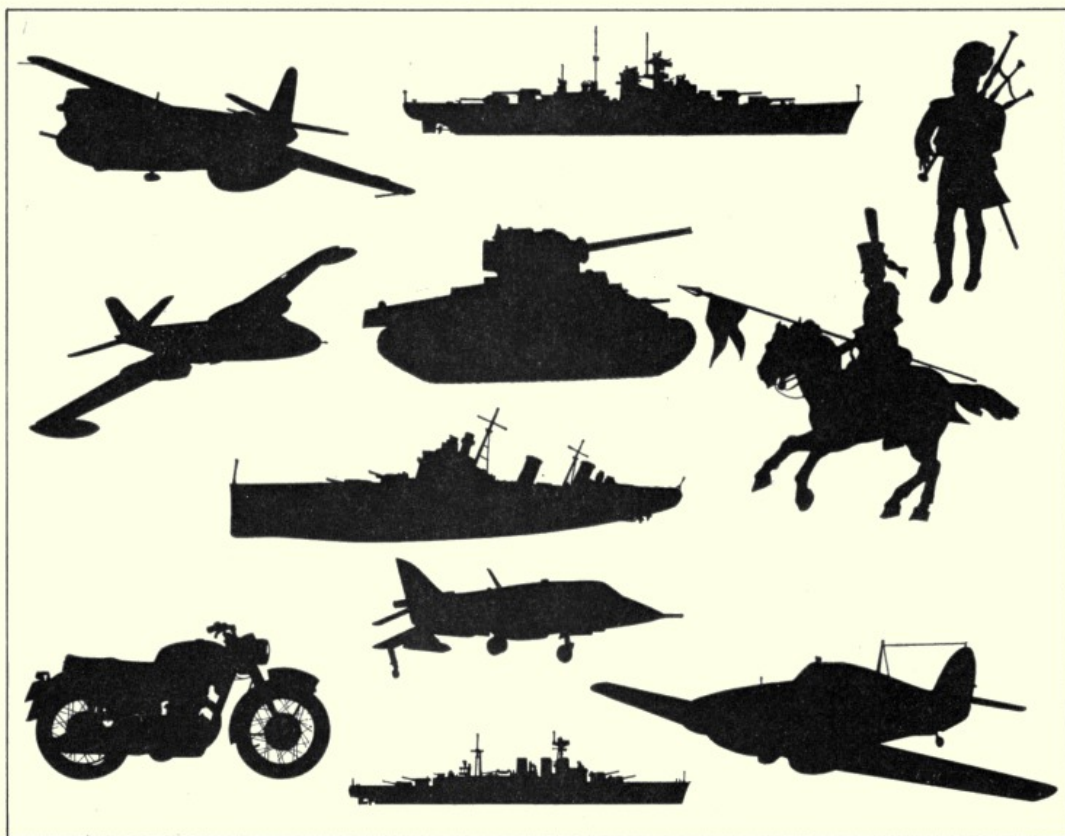
next month

Free full-sized plan for free-flight JA power model from Tony Cordes' stable. Return of our beginners' series with a new subject, and for control line competition enthusiasts, Rob Metkemeyer offers much practical advice on flying F.A.I. team-race. All this plus regular (and not so regular!) features in the October issue - on sale September 21st.

Made and printed in Great Britain by Graphic Art Services (Brighton) Ltd., Burgess Hill, Sussex RH15 9EH, for the proprietors, Model & Allied Publications Ltd., P.O. Box 35, Bridge Street, Hemel Hempstead, Herts HP1 1EE. Published by Argus Press Ltd., 12-18 Paul Street, London, E.C.2, to whom all trade inquiries should be addressed. Registered at the G.P.O. for transmission by Canadian Magazine Post.

The AIRFIX PROGRAMME of NEWCOMERS-

second to none
...and the shape of kits to come.



The world's biggest range of construction kits.

Don't miss these Airfix publications!

Airfix Catalogue – 64 full colour pages 15p.

Airfix magazine – a 'must' for modellers, 15p monthly.

Airfix books – 'HMS Victory', 'Mayflower', 'Spitfire',

'Messerschmitt BF 109' and 'P.51 Mustang' –

all available now.



KINDLY MENTION 'AEROMODELLER' WHEN REPLYING TO ADVERTISEMENTS



We have a good case to help you create super models

No. 82
X-acto Burlington
Hobby Chest
Just one of the many
hobby kits available.

You have only to glance at our case to see that in your hands these precision X-acto tools will give a new dimension in the creation of even finer modelling.

X-acto—everything from a single knife to a complete Hobby Chest.



KNIVES · PLIERS · FILES · RAZOR
SAWS · CLAMPS · DRILLS ·
SCREWDRIVERS · SOLDERING
IRON/HOT KNIFE.

**AVAILABLE FROM ALL
GOOD MODEL SHOPS**

Graupner

NYLON FIBREGLASS PROPS

5 x 2 ... 29p	7 x 6 ... 42p	9 1/2 x 5 ... 49p	SPECIALS
6 x 3 ... 36p	8 x 4 ... 44p	10 x 4 ... 52p	2-bl. Pusher
6 x 4 ... 36p	8 x 5 ... 44p	10 x 5 ... 52p	9 x 6 ... 64p
6 x 5 ... 36p	8 x 6 ... 44p	10 x 6 ... 52p	10 x 6 ... 69p
6 x 6 ... 36p	9 x 4 ... 46p	10 x 7 ... 52p	3-bl. Tractor
7 x 3 ... 42p	9 x 5 ... 46p	11 x 7 ... 57p	5 x 3 ... 33p
7 x 4 ... 42p	9 x 6 ... 46p	11 x 8 ... 57p	8 x 6 ... 69p
7 x 5 ... 42p	9 x 7 ... 46p	12 x 6 ... 62p	10 x 5 ... 78p

GRAUPNER	10 x 6 ... 99p	MAPLEWOOD
AHORN	10 x 7 ... 99p	2-bl. pusher
MAPLEWOOD	11 x 6 ... £1.10	8 x 4 ... £1.00
The finest precision machine-cut wooden propellers!	11 x 7 ... £1.10	9 x 6 ... £1.05
	11 x 8 ... £1.10	10 x 6 ... £1.10
	12 x 5 ... £1.15	11 x 6 ... £1.15

distributed by **RIPMAX**

SEE THEM ALL AT YOUR LOCAL MODEL SHOP!

THE BEGINNING - AND THE END (OF MODEL KIT CONSTRUCTION)

START RIGHT BY USING X-ACTO TOOLS

81 **KRYSTAL-PAK KNIFE SET** Nos. 1, 2 and 5 knives plus 10 assorted extra blades, in handy case £2.04.

82 **KNIFE CHEST** Nos. 1, 2 and 5 knives plus 9 assorted blades in natural finish wood chest £2.75

83 **BURLINGTON KNIFE AND TOOL CHEST** Nos. 1, 2 and 5 knives, blades, gouges, routers, planer, sander, stripper, spoke-shave, etc., in fitted wood chest £7.54.

513C **RAZOR SAW AND KNIFE SET** One NU 5 handle plus 3 assorted sawblades and keyhole blade plus 5 knife blades. A very useful set indeed! Price £1.85 per set.

371 **SCANNER** Pocket-sized illuminated scanner - built in 5 power lens - complete with batteries and carrying pouch. Price £1.21.

53 **ST RAZOR SAW SET** No. 5 handle with two assorted razor saw blades. Price 99p.

46 **'C' CLAMP SET** Four varied 'C' clamps. Price £1.32 per set.

NEEDLE FILES Six assorted types available: half round; knife; round; square; 3 square; equalling. Price 13p each.

FINISH PROFESSIONALLY WITH A BADGER AIRBRUSH

BADGER AIR BRUSH paint sprays provide the user with a highly versatile tool performing with ease, jobs that are difficult with a brush or other methods. The air brush gives a finer finish than spray cans and uses economical small paint jars. Colours can be mixed or straight, solid or tint. Use a fine spray or heavy spray - do fogging and blending. Make textures, patterns, designs or stencils. When a soft edge is needed such as blending one colour into another, painting camouflage or military aircraft models, a weathered finish on a steam loco, etc. - no edges or brush marks will show.

STANDARD MODEL 200 An easy-to-use, single action air brush, adjustable from a very fine spray for delicate painting or shading, to full spray to cover larger areas. Positive push-button control. Precision made, all metal components with Teflon bearings and seals. With proper care and cleaning, years of fine service can be expected. The standard kit includes No. 200 Air Brush unit, Six Foot Vinyl Air Hose, Propel Aerosol Can Air Valve, 1/2 oz. Paint Jar, Airbrush Holder and Instruction Manual. Price £20.13.

DE LUXE MODEL 200 KIT As per standard kit, but includes two containers, Badger Propel, 2 1/2 oz. Jars, etc. Price £22.50.

BADGER MODEL 250 PAINT SPRAY AIR BRUSH Air Brush and Air Valve are made of high impact Delrin with metal control and adjustable paint tip, the hose of lightweight vinyl - both materials resist solvents and paint chemicals. This is the 'economy' priced unit in the range - rugged and reliable and beautifully boxed at £4.95. (It will be necessary to purchase a can of propellant (72p) to operate this unit.)

A complete range of spares and accessories are available.

**TRADE SUPPLIED
(MODELS) LTD.,
14 NEW CAVENTISH STREET,
LONDON W1
Telephones: 01-935 8835 - 01-486 3561**

W & H
Business Hours: Monday-Saturday 9.00 a.m.-5.30 p.m.

KINDLY MENTION 'AEROMODELLER' WHEN REPLYING TO ADVERTISEMENTS

SUPER Tigre Choice of Champions!

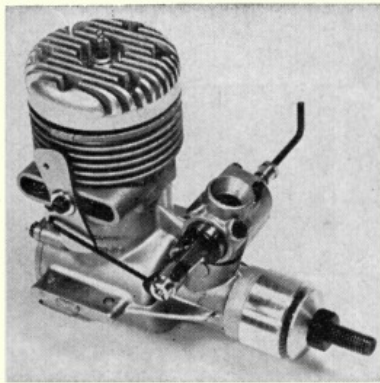
THE NAME THAT STANDS FOR SPEED & POWER

Those modellers and dealers who took time out to read our advert in the June issue will realise we had a right clanger on our hands. All the chat was about our attempt to up-date our stock information by the use of asterisks for in-stock motors. Unfortunately due to the spring bank holiday and a delay in the post the advert was printed without any asterisks at all indicating nil availability. Fortunately our trade friends, knowing our service, didn't take the omission seriously and we were able to meet most orders.

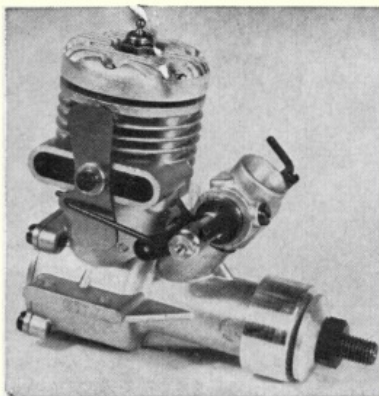
Fortunately R.C.M.&E. appears shortly after *Aeromodeller* and this corrected the error.

A phone call from Italy indicates that all the smaller sizes of motors are being made this month (July) prior to going on holiday in August.

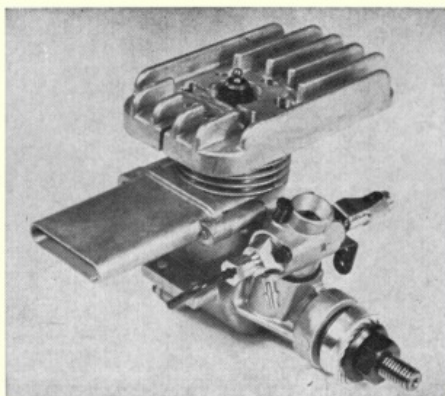
We have just received a massive shipment of spare parts from the factory and should be able to meet requests for most spares from stock.



ST.60 BB R/C



£19.30 ST.35 R/C



£13.72 G15/19 CAR

£18.49

THE SUPER TIGRE RANGE

G20/15 D	£9.90	G15/19 CAR	£18.49	ST.35 S R/C	£13.72
G29/15 D R/C	£12.17	G21/29 R.V. ABC	£17.09	ST.51 R/C	£17.08
G20/15 G	£9.90	G21/29 F.1	£12.17	ST.66 R/C	£18.29
G20/15 G R/C	£12.17	G21/29 F.1 R/C	£15.24	ST.60 R/C	£19.30
G15 F.1 with spinner	£12.58	G21/35 F.1	£12.40	G60 F.1 R/C	£24.38
G15 F.1 R/C	£15.74	G21/35 F.1 R/C	£15.45	G71 F.1 R/C	£24.89
G15 R.V. D	£15.65	G21/40 F.1	£13.21	G60 R.V. Racing	£30.49
G15/19 F.1 R/C	£15.74	G21/40 F.1 R/C	£16.17	G60 Marine	£33.53
G15 R.V. G	£15.65	G40 ABC R/C	£19.08	G60 Marine R/C	£35.57
G15/19 F.1	£12.58	G21/46 F.1 Std.	£13.82	G21/29 M	£18.76
G20/23	£9.90	G21/46 F.1 R/C	£17.01	G21/29 R/C M	£21.25
G20/23 R/C	£13.10	ST.35 Std.	£10.57	G15 R/C M	£17.06

*Asterisks indicate current stock as of August 1st.

ADDITIONAL SPARE PARTS AND ACCESSORIES PRICES

SUPER TIGRE ACCESSORIES

Silencers	
S.15 fits G20/15, 19, 23	£2.70
S.29 fits G21/29, 35, 40, 46	£3.30
S.35 fits ST.35 Stunt or Combat & R/C	£3.30
S.40 fits G40 only	£3.30
S.56 fits ST.51, 56, 60	£3.30
S.71 fits G60, F.1 or R.V. and G71	£3.75
G15 tuned pipe	£2.70
G21/29 tuned pipe	£3.30

G60 tuned pipe	£3.75
Glow plug standard	36p
Glow plug R/C	68p
Glow plug speed	46p
Spinners G15, G29 and G60	£1.25
Spinners Screw on type 2 1/2" dia.	£1.75
Radial mount G20/15, 19, 23 and G15 series	£1.87
Radial mount G21/29, 35, 40, 46	£1.87
Radial mount ST.51, 56 and 60	£1.87
Needle valve, all sizes except	

G20 R/C	15p
Needle valve, G20 R/C series	15p
Needle valve and spray bar	50p
Mag. 111 Jet assembly	62 1/2p
Idle needle assembly	62 1/2p
R/C Carburetors	
Mag. 111 G20 and G15 series	£3.75
Mag. 111 G21, 60 and ST series	£4.25
Seelig Gambrinus Free flight mount	£3.00
R/C car heat sink	£2.00
Exhaust extension (R/C car)	£1.25

SUPER TIGRE MOTORS ARE AVAILABLE FROM THE VERY BEST MODEL SHOPS



WORLD ENGINES

LIMITED

97 TUDOR AVENUE, WATFORD, HERTS
PHONE WATFORD 42859

VISITORS BY APPOINTMENT

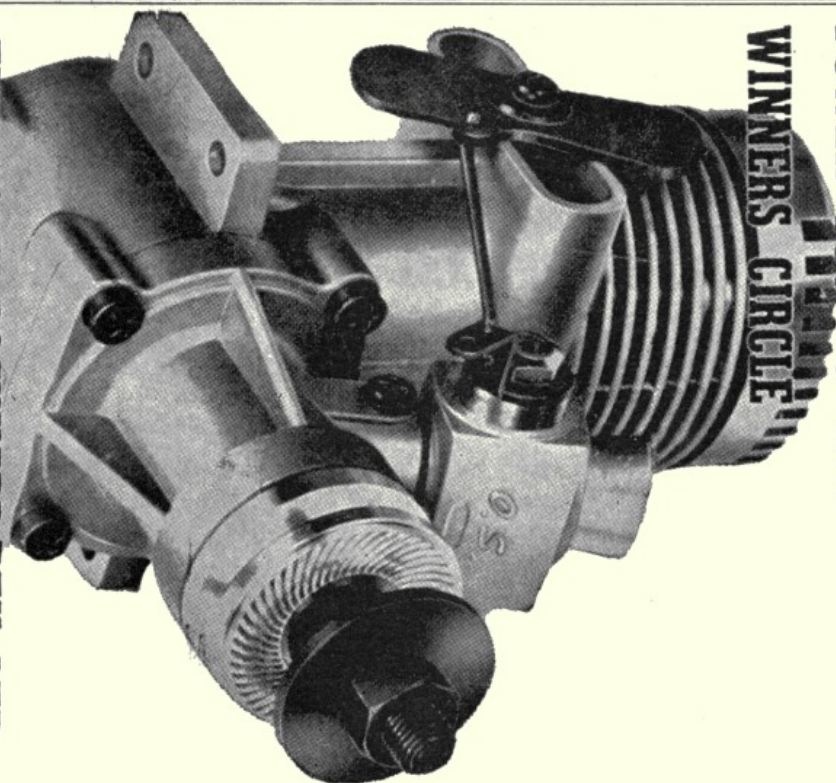
S.A.E. WITH INQUIRIES PLEASE

KINDLY MENTION 'AEROMODELLER' WHEN REPLYING TO ADVERTISEMENTS

NOVICE OR EXPERT LET **O.S.**

POWER YOU TO THE

WINNERS CIRCLE



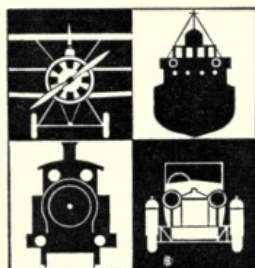
THE MODEL DOCKYARD PTY. LTD.

216-218 SWANSTON STREET

MELBOURNE, Ph. 663-3505

AUSTRALIA

NO MATTER WHICH WAY YOU LOOK AT IT



43rd Model Engineer

EXHIBITION . 1st - 12th January 1974

Model Locomotives, Boats, Aircraft,
Traction Engines, Militaria, Crafts

WHAT WILL BE FEATURED?

All the popular features of past years will again be provided. M.E. Workshop with our own expert consultants and contributors, plus S.M.E.E. members: S.M.E.E. Passenger Track with steam locomotives. MARINA 98 ft. by 28 ft. for R/C boat demonstrations. Large flying circle for Electric R.T.P. aircraft - better than ever. Trade Stands; Demonstrations; Special 75 years of Models on Display; Plus all the beautiful competition entries; Militaria.

ENTRIES

Every kind of model is eligible to enter. Over 20 trophies; over £300 in prizes, plus the pleasure of displaying your efforts and seeing those of other people. Rules and Entry Forms

available now. All small models displayed under glass to keep them clean and untouched.

PRIZE POOL ALLOCATION

Classes attracting six or more entries have 1st Prize £5, 2nd £3, 3rd £1. Over 12 entries, 1st £7, 2nd £4, 3rd £2, 4th £1. Under six entries, 1st and 2nd only, or at judges' discretion may be combined with other classes.

CLUBS

Club parties are especially welcome. Some clubs are arranging with us for a special day, when they will put their boats on the pool, arrange for their best locomotives to enjoy 'track time' and even have their varied contest entries grouped as a combined 'club show'. If yours can

do something special, please tell us soon, so that we can work it in.

MILITARY MODELLING

In addition to contest classes, we shall be staging war games sessions. If your club wants to take part, or have good experts available to steward, please tell us.

STEWARDED

We can always use a select band of stewards expert on model subjects. If you have time, strength (it's a hard day!) and knowledge, please tell us.

CLOSING DATE

Model entries should be in by mid-October. There are always late-comers - please enter early, it helps us. Still nearly six months to finish it!

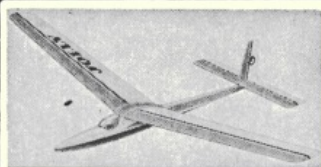
Details from Exhibition Manager (ME), M.A.P. Ltd., P.O. Box 35, Bridge Street, Hemel Hempstead, Herts HP1 1EE

KINDLY MENTION 'AEROMODELLER' WHEN REPLYING TO ADVERTISEMENTS

RIPMAX

RIPMAX SPITFIRE £20.95

A 63" span near-scale model for 40-61 engines. Realistic scale appearance - without the handling problems of many scale models! Kit includes veneered foam wings, pre-cut balsa and ply parts, moulded canopy, engine mount, formed wire undercarriage, nylon horns and wing bolts, hinge material, 7" diameter roundels, etc.
A SPECIALLY RECOMMENDED KIT!



STERLING

A superb series of RUBBER-POWERED FLYING SCALE MODELS, many with IN-FLIGHT ACTION FEATURES. Convertible to powered free flight or control line models.

- Fokker D-7 24" £3.20
- Stearman PT17 Crop Duster £2.65
- Boechraft Bonanza 22" £2.10
- P-47 Thunderbolt 20" £2.10



STERLING KITS

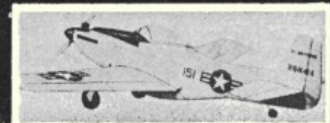
Top models specially selected from the STERLING range by RIPMAX - scale and freeline designs, each one in pre-fabricated kit form. The R/C scale models are also adaptable to CONTROL LINE if preferred. Choose your favourite from this famous American range.

NEW STERLING KITS

- CURTISS JENNY* 32 3/4" span ... £4.25
 - FOKKER TRIPLANE* 23 1/2" ... £4.25
 - DIAMANT SAILPLANE 74" ... £4.25
 - P-40 WARHAWK* 27" span ... £4.25
 - CITABRIA* 33 1/4" span ... £4.25
 - PIPER SUPER CRUISER* 35 1/2" ... £4.25
 - CIRRUS 87 1/4" span ... £5.80
- * rubber powered



- RIMFIRE 56" span ... £14.80
- SCHWEIZER 1-34 98 1/2" ... £15.95
- SCHWEIZER 1-26D 70" ... £11.65
- FLEDGLING 56" span ... £14.30
- CITABRIA 54" span ... £15.95
- PIPER TRI-PACER 58 1/2" ... £12.70
- CESSNA 180 45" span ... £7.95
- FAIRCHILD PT-19 48" ... £9.95
- PIPER CUB J-3 54" ... £9.50
- PIPER SUPER CRUISER 72" ... £19.60
- MUSTANG P-51 66" ... £24.40



- KING COBRA 70" ... £22.80
- SPITFIRE 64" ... £24.40
- STEARMAN PT17 64 1/2" ... £28.95
- FOKKER D-7 58 1/2" ... £25.50
- SESA BIPLANE 40 1/2" ... £13.80
- WIZARD BIPE 54" ... £13.25
- LANCER 53 1/2" span ... £15.95
- SUPER LANCER 5L-62 ... £20.95

GOLDBERG KITS

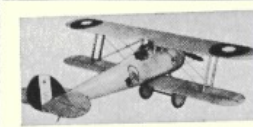
- SNR FALCON DE LUXE 69" ... £22.30
- FALCON 56 DE LUXE 56" ... £11.95
- JNR FALCON DE LUXE 37" ... £4.75



- SKYLANE 42 DE LUXE scale ... £5.95
- SKYLANE 62 DE LUXE scale ... £22.30
- SKYLARK 56 DE LUXE ... £13.80
- JUNIOR SKYLARK DE LUXE 37" ... £5.35
- SHOESTRING P/RACER 54" ... £17.95
- SWORDSMAN 18 1/8" span ... £2.10
- L'I'L WIZARD 21" span ... £2.35
- L'I'L JUMPIN' BEAN 21" ... £2.10
- SHOESTRING STUNTER 42" ... £4.75
- L'I'L SATAN Combat 19" ... £1.80
- RILEY WOOTEN VODOO 36" ... £2.95
- JUNIOR SATAN 29" span ... £2.35

GRAUPNER GLIDERS

- FOUGA SYLPHIE (Jetex) £2.10
- 26" span £3.25
- BEGINNER 39" span £5.80
- FILOU 39" span £5.80
- Pylon engine mount £1.05
- JOLLY 45" span £4.30
- Pylon engine mount £1.05
- AMIGO 2 78 1/4" span £9.95
- Pylon engine mount £1.40
- Ditto in ABS £2.80

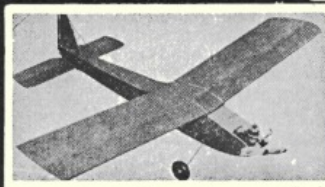
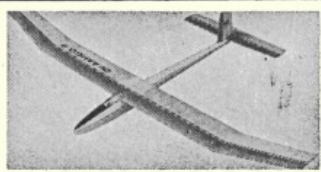


RIPMAX GANGSTERS



- Gangster 48 £14.45
- Gangster 63 £17.95

Foam-plastic wings; all balsa and ply parts pre-cut, tank, hardware, etc. Fully aerobatic R/C models for modern proportional radio. SUPER DE LUXE KITS for quick assembly!



- FOKA 102 1/4" span £16.80
- Canopy 75p Fuselage £6.20
- Wing formers (10) £1.10
- UHU Mark III 43 1/4" ... £3.35
- DANDY 63" span £8.25
- Pylon engine mount £1.05
- CIRRUS 118" span £22.40
- Canopy 59p Fuselage £10.20
- Mounting Fibs £1.20
- Canopy frame £1.45
- Pylon engine mount £1.70
- R/C pack £3.55
- NANCY 48 3/4" span £4.90
- KATY 67 1/4" span £9.30
- CUMULUS 2800 110" £49.95
- Canopy 60p Fuselage £16.60
- Wings (pair) £20.60
- Stabilisers £7.75
- Rudder £4.10 Cabin £3.80
- Canopy frame £1.45
- Pylon engine mount £1.70
- R/C pack £2.90

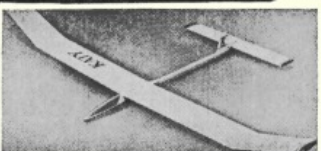
FOUR NEW DAZZLERS - all now with nosewheel undercars and other detail design changes, etc. These deluxe kits include veneered STYRO-TRU foam wings, pre-cut balsa and ply parts, and hardware.

FOR SINGLE-CHANNEL R/C

- All new DAZZLER 30 (30" span) £4.60
- All new DAZZLER 36 (36" span) £5.95
- All new DAZZLER 42 (42" span) £7.40

FOR MULTI & PROPO R/C

- DAZZLER 48 (48" span) ... £9.50
- DAZZLER 54 (54" span) ... £11.70
- DAZZLER 63 (63" span) ... £13.90
- BASIC MINI-TRAINER (R/C) 48" £9.60
- FULLHOUSE MINI-TRAINER 48" £10.60
- BASIC TRAINER 60" ... £11.80
- FULLHOUSE TRAINER ... £11.80
- SENATOR 52" ... £10.90
- SUPABIFE 50" ... £15.45
- SKYQUEEN 58" ... £9.95
- IVINGHOE 72" ... £9.80



STERLING CONTROL LINE

- SES Biplane 32" span £7.95
- Fokker D-7 32 1/4" span £7.95
- Corsair F4U 1 35" span £8.50
- Nieuport 28 33" span £7.95
- Stearman PT17 32 1/4" £7.95
- Great Lakes Trainer 36" £7.95

TOPLITE KITS

- SCHOOLBOY 29" span ... £2.95
- SCHOOLMASTER 29" span £5.40
- HEADMASTER 48" span £9.75
- SCHOOLGIRL BIPE 32" span £4.95
- RASCAL 27" span ... £2.80



- AS-K14 90 1/2" span £44.60
- Canopy 55p Fuselage £19.60
- R/C pack £4.85
- HI-FLY 90 1/2" span £14.20
- R/C pack £2.45
- Pylon engine mount £2.80
- Electric motor flight pack £9.60
- Installation pack £3.25
- E/F battery £12.60
- Folding prop £1.45

GRAUPNER C/L KITS

- MUSTANG 29 1/4" span £6.30
- DORNIER Do27 29 1/4" £7.85
- FOCKE WULF 190 38 1/4" £9.50
- KLEMM KL-107B 20 1/2" £6.55

'KWIKFORM' KITS



- EINDECKER near-scale 56" span £14.30
- Kit includes aluminium cow, wheels.
- Also NIEUPORT 18 ... £16.80
- SOPWITH SWALLOW ... £15.70
- B29 MITCHELL 74" ... £39.95

With veneer-covered Styro-Tru wings, all balsa and ply parts pre-cut, hardware, etc. Designed for R/C flying.



see them all AT YOUR MODEL SHOP!

Some descriptions and prices may be subject to change, due to our policy of continual improvement, fluctuating exchange rates, etc.

KINDLY MENTION 'AEROMODELLER' WHEN REPLYING TO ADVERTISEMENTS

M.E.



1cc HERON
1.5cc SNIPE

IF IT'S
RipMax
IT'S
GOOD!


Quite the easiest-starting, sweetest-running diesels available in the world today! Plus, of course, the UNIQUE ADVANTAGES of TWIN SILENCERS - quiet running with virtually no power loss. YOUR CHOICE of the 1cc HERON, or the 1.5cc SNIPE (the latter available with or without R/C-type throttle).

M.E. HERON AIRCOOLED	M.E. SNIPE AIRCOOLED
STANDARD £4.25	STANDARD.....£4.95
Twin SILENCERS £1.35	R/C (with throttle) £5.80
	Twin SILENCERS . £1.35

distributed by *RipMax*


AT YOUR MODEL SHOP

LONGER LIFE



BRIGHTER GLOW

JOY LUMINOUS PAINT



See in the dark with JOY Luminous Paint. Ideal for use on skeletons, toys, models, novelties, light switches, door numbers, paper, cardboard, and materials etc. Light active but not radio active. Outfits contain Base Reflecting Coat and Top Luminous Coat. Green shade only.

JOY is a registered trade mark of TURNBULLS LTD., LONDON, S.W.17.

EXTRAVAGANZA '73

AT THE MODEL SHOP (MANCHESTER)

In conjunction with RIPMAX Ltd.

Featuring the fabulous RIPMAX MOBILE EXHIBITION

AUGUST 29th to SEPTEMBER 5th including Sunday, 2nd September

Open 10 a.m. - 8.30 p.m.

OTHER FEATURES INCLUDING:—

- ★ Full display of products by **WALTRON ELECTRONICS**
- ★ Helicopters by **GRAUPNER** and **SCHUCO**
- ★ Northern debut of the fabulous **AUSTRO-WEBRA 61 R/C**
- ★ The unbelievable **MARUTAKA** scale kits
- ★ £10 voucher to all customers buying a **DiGI-ACE** radio during 'EXTRAVAGANZA'

PLUS.—

Many special money-saving offers available to visitors during 'Extravaganza' week only.

FREE COMPETITION:—

Open to all buying an R/C kit, radio or engine during 'EXTRAVAGANZA' - WIN A WIFE-PLEASING MINI-HOLIDAY ABROAD.

Free Draw Ticket to all visitors to 'EXTRAVAGANZA' - many valuable prizes.

Special offer available to callers only.

Limited number of Marutaka Marabu Mk. III kits £18.95 (List price £26.50). First come, first served.

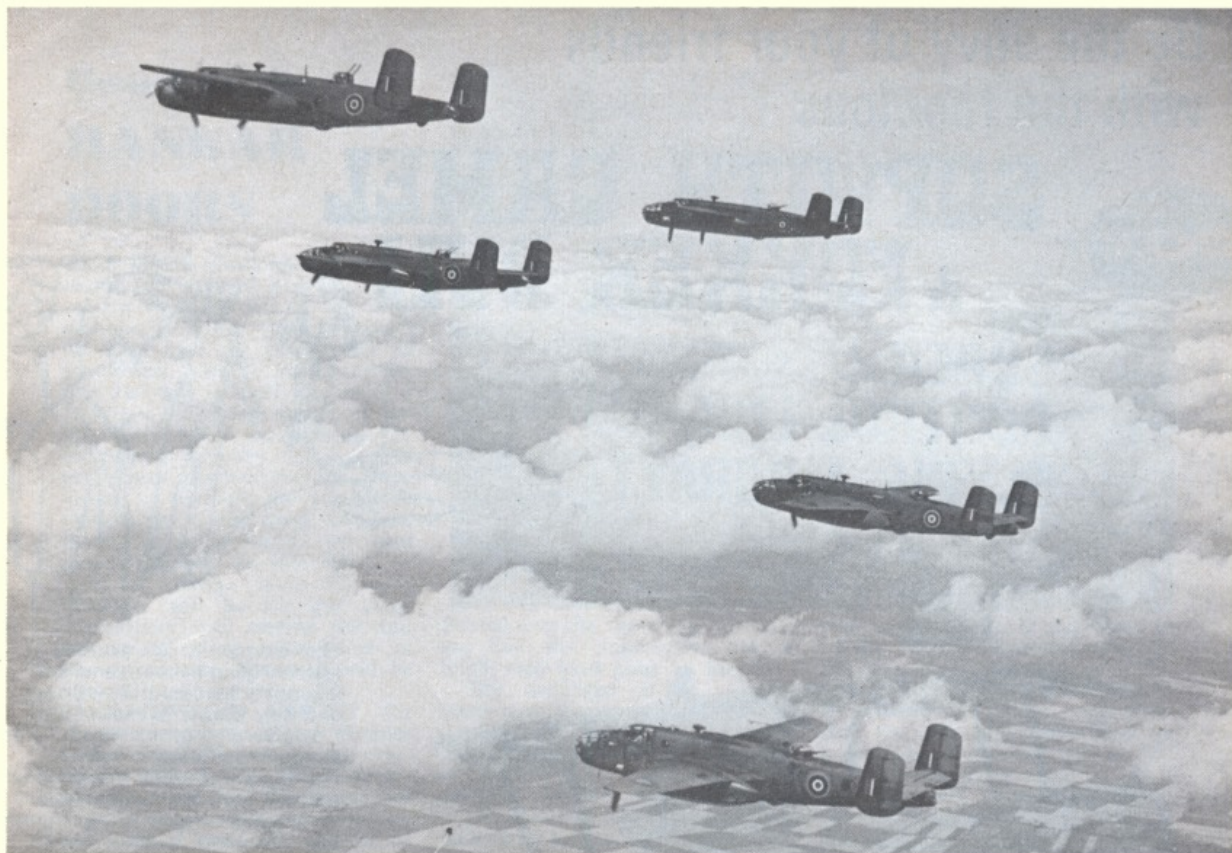
SEE POSSIBLY THE FINEST DISPLAY OF RADIO CONTROL EQUIPMENT, KITS AND ACCESSORIES EVER ASSEMBLED IN THE NORTH-WEST - DON'T FORGET THE DATES.

See you at **THE MODEL SHOP (MANCHESTER)**

7-13 BOOTLE STREET, DEANSGATE, MANCHESTER M2 5QU

Tel. 061-834 3972

KINDLY MENTION 'AEROMODELLER' WHEN REPLYING TO ADVERTISEMENTS



How many could we send now?

And how many could any of the world's 113 national airforces put in the skies? The answer to these questions can be found in the "World's Air Forces" chapter of a brand new reference book for the aircraft enthusiast called 'Know Aviation'. Its six chapters are designed to give the reader more than just a superficial knowledge of aviation by, tracing the history of aviation from its humble beginnings in the late 18th Century, through the awe-inspiring pioneering flights of the Wright Brothers' era, to today's technological revolution in air travel.

A Chronology of Aviation – from the nostalgic early days when 'lighter than air' craft – airships and balloons – graced the skies.

The World Air Lines – the commercial air lines, routes and principal airports.

The 'Classic' Aircraft – illustrated in full colour – the triumphs of design and invention, that dominated the skies and helped change the course of history over the last fifty years.

A modern international section – **The World's Aircraft** – a reference section of specifications of civil and military aircraft.

A Who's Who of Aviation – famous men and women of different nationalities.

The World's Air Forces – a survey of 113 national air forces today, their origins, a brief history, current combat strength and operational air bases. (Only saleable book to include these details.)

Know Aviation
Francis Mason &
Martin Windrow

256 pages/app 150 superb
illustrations/full colour
plates £2.75



Available from bookshops or to order your copy of 'Know Aviation' fill in the coupon below and post it, together with a cheque/P.O. for £2.75 made payable to George Philip and Son Limited to: P.O. Box 1, Littlehampton, Sussex.



K5

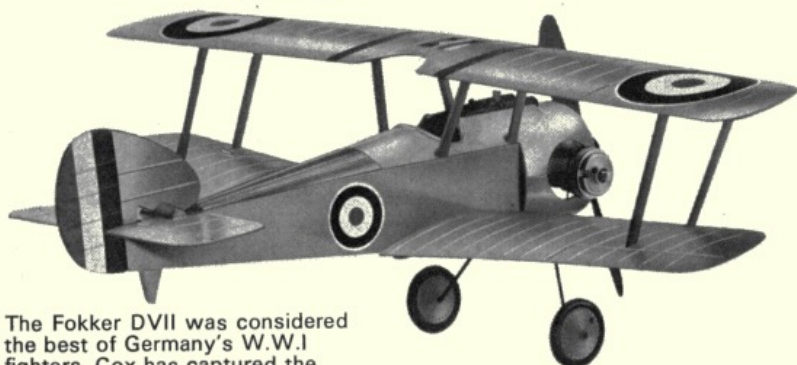
KINDLY MENTION 'AEROMODELLER' WHEN REPLYING TO ADVERTISEMENTS

Be the envy of your friends
with the fabulous



SOPWITH CAMEL & FOKKER DVII

**SUPER
CONTROL LINE
FLYING AIRCRAFT**



The Fokker DVII was considered the best of Germany's W.W.I fighters. Cox has captured the glamour and thrills of the gallant, steel-nerved air aces of W.W.I, with the faithful reproduction of the Fokker DVII. Designed for aerobatic flying, the Fokker responds quickly to the pilot's every wish. Cox's DVII looks as good as she flies, with Flying Circus style decoration, twin Spandau type 'machine guns', simulated wooden propeller, steel wire landing gear and authentic 'radiator'. To help survive the fortunes of aerial dogfighting, the Fokker is moulded in high impact plastic. Powered by Cox .049 engine, Wingspan is 13".

The romance of silk scarves, leather flying helmets and the legendary heroes of Roy Brown and Billy Barker is captured by Cox's version of the Royal Flying Corps' most famous fighter – the Sopwith Camel. Designed to perform with the manoeuvrability of Britain's famous W.W.I fighter, Cox's Sopwith features 'wood grained' prop, authentic type landing gear, realistic fighter pilot markings, rugged wing struts, simulated machine guns and 13" wingspan. All the details for an authentic model plus it's powered by the famous Cox .049.



8000 Camel	£7.53
8100 Fokker DVII	£7.53

AVAILABLE FROM HAMLEYS AND
ALL GOOD TOY AND MODEL SHOPS



A.A. HALES LTD.
P.O. BOX 33 HINCKLEY LEICESTERSHIRE

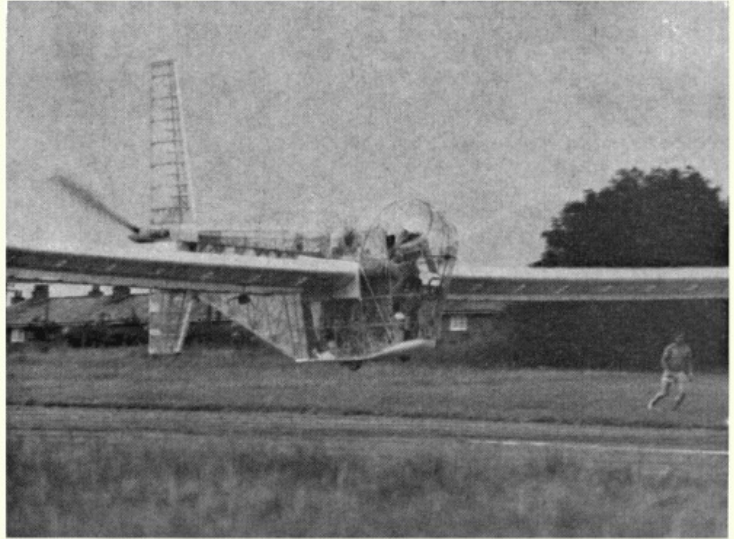
KINDLY MENTION 'AEROMODELLER' WHEN REPLYING TO ADVERTISEMENTS

Heard at the HANGAR DOORS

THIS ISSUE closes another era in the 38-year saga of *Aero Modeller* in that it is the last of the '15p' editions. For four years precisely, we have held the cover price to the lowest possible economic figure, and that in itself is a bit of a record in the helter-skelter of rising costs which have overtaken the printing industry. Our last price adjustment was held for only three years, so perhaps there is some consolation in that we've sustained the cover price for 33 per cent longer than in the late 60s.

As of October issue '73 *Aero Modeller* will be 20p per copy. Subscribers will receive the full balance of their subscription at the agreed rate. Renewals will be charged at £3 per year (\$8).

MAN-POWERED FLIGHT for the now enormous Henry Kremer prize of £50,000 remains the ever-elusive achievement. Many are the theories, varied are the approaches and the biggest division of opinion has centred upon the number of crew. One man or two? For a long time the solo flyer has held the attention through SUMPAC, PUFFIN, LINNET, JUPITER, DUMBO and LIVERPUFFIN. Now we can report success with TOUCAN, the first ever two-man machine to fly successfully. On July 3rd at Radlett, Hertfordshire, the *Herts Pedal Aeronauts* made two remarkable flights, the first of 700 yards and the second of 300 yards. Derek May (propulsion) and Brian Bowen (pilot) took turns to apply full exertion and as the huge 123-foot span balsa, spruce and Melinex machine



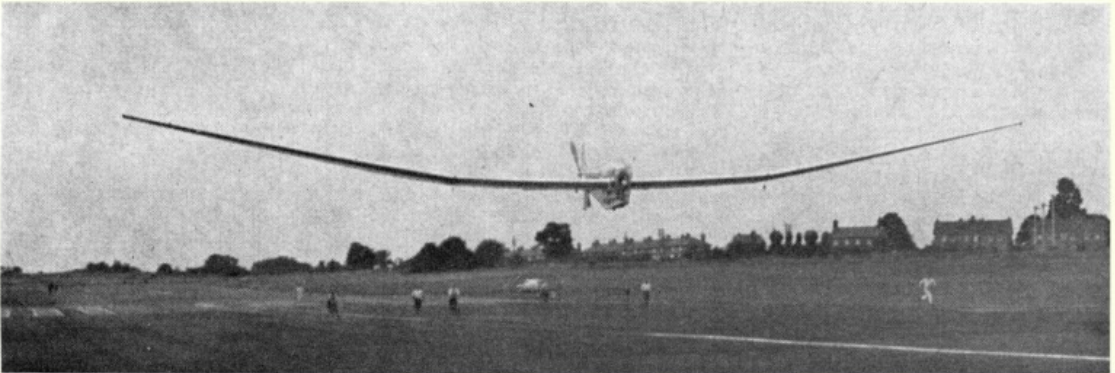
floated over the runway at 15-18 ft. we had the impression that it might well have gone on for ever.

The dedicated H.P.A. Group have now dismantled *Toucan* for a major inspection and potential alterations with a target of greater efforts in 1974.

AFTER MANY difficulties the South Midland Area Officers have once more negotiated the use of the popular Cranfield (Bedfordshire) venue for their rally, which is one of the biggest and most successful meetings in the Annual Calendar. Difficulties which arose were not caused by the 'usual' problems such as noise, damaged crops, litter, etc., but to an ever-increasing threat to model flyers everywhere - commercial viability. To be blunt, the South Midland Area simply could not afford the fee which is normally required for the day's use of their field. Successful negotiations were eventually arranged to continue the long-standing S.M.A.E./Cranfield relation-

ship, although this is still likely to be the last model aircraft rally on this site. Next time you complain at paying a little more programme or contest fee money, remember that the only alternative may be *no* contest to attend! Junior enthusiasts will be pleased to know that there will be a free-flight Kit Contest (*Mercury Swan* and *Keil-Kraft Senator* models only) as well as a Junior Stunt contest. Rules for these junior contests will be the same as used for the Nationals and there will be good prizes and *no* entry fees - which can't be bad! Date to remember for this possibly last-ever South Midland Area Rally is September 23rd, and the charge to enter the airfield for a wonderful day of activity and entertainment will be £1 per car. Details of the contest involved will be found under 'Contest Calendar'.

Both pictures on this page illustrate an historic moment as the two man-powered aircraft 'Toucan' flies for the first time.



MITSUBISHI ZERO



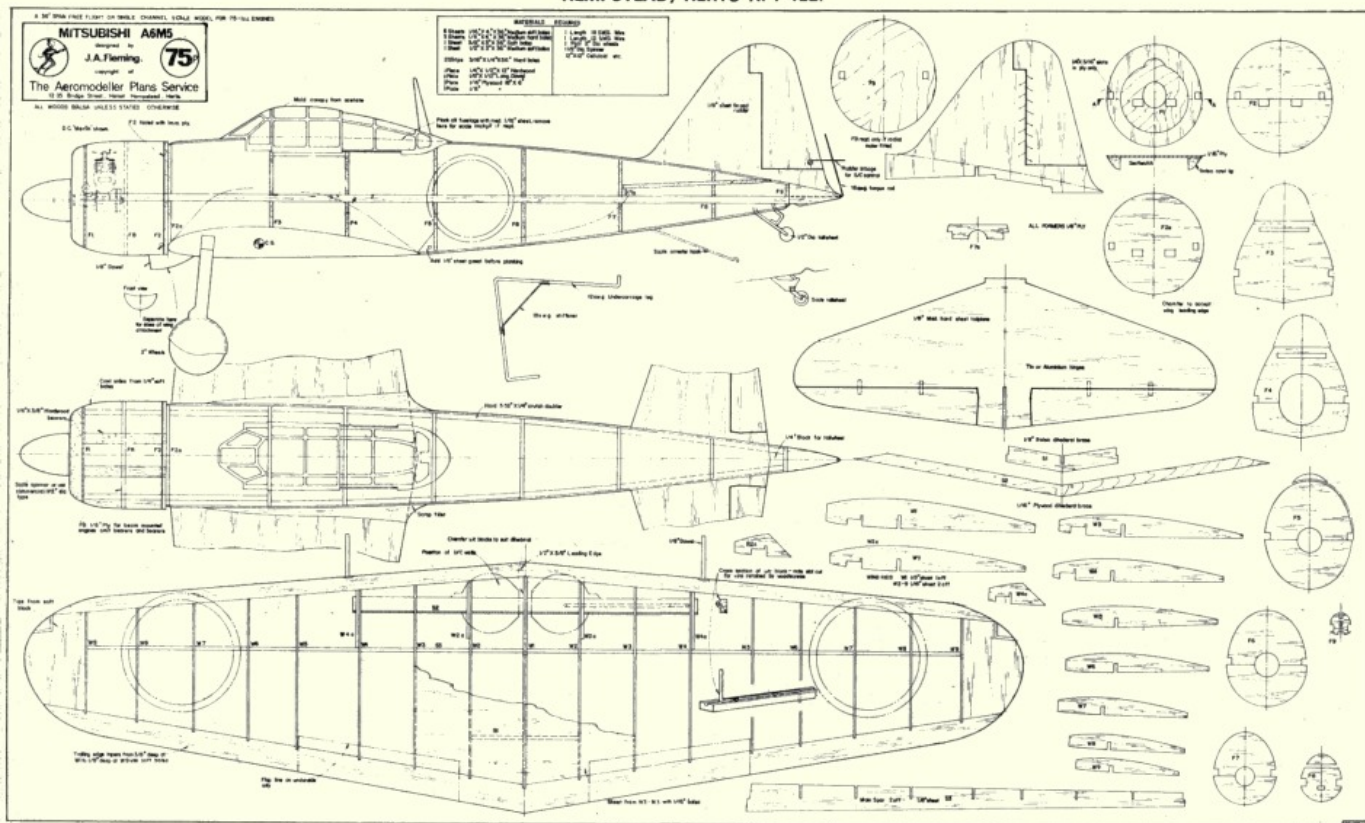
a 36 in. span semi-scale version of the Japanese fighter for free-flight or simple radio control using 0.75-1 c.c. engines designed by J. A. FLEMING

WORLD WAR II fighter aircraft are always favourite subjects for scale models – they appeal immensely to builders and spectators alike as they are instantly recognisable and have attractive lines – no-one could call a modern day fighter 'pretty' as they all have minute wings which are simply cluttered up with underwing stores, and to the layman, look so alike. The only 'snag' with a World War II fighter is that so many aircraft have been 'done' before (just look at the number of Spitfires and Messerschmitts seen around) and very few appear suitable for free-flight or single-function radio control. Any experienced modeller will tell you that a low wing scale subject would be an instant disaster flown free-flight, but with a little cheating the 'impossible' can be achieved. Most obvious change to this Zero is the increase in dihedral for greater stability plus the enlarged tail-plane. Purists may be offended, but the overall

impression remains, and the design flies well which is what really matters anyway!

The original model was flown with single channel pulse-proportional radio control, utilising the Mighty Midget electric motor. This servo is no longer available, nor indeed has 'Gallop Ghost' been able to survive in the face of progress, and it is thus suggested that those who prefer to control the flight pattern of their model rather than to allow it to fly free, should install single channel equipment or else one or two function proportional radio control. The latter could be used to control the elevator and rudder, but in this instance a 1-1.5 c.c. engine would be recommended and every effort to save excess weight should be taken. However, do *not* save weight fitting ultra-light wheels – low down weight such as these aid stability by lowering the C.G. The detachable wing provides access to R/C equipment but is

FULL-SIZE COPIES OF THIS 1/7th SCALE REPRODUCTION ARE AVAILABLE AS PLAN NO. RC1165, PRICE 75p, INCLUSIVE OF V.A.T. AND POSTAGE, FROM AEROMODELLER PLANS SERVICE, P.O. BOX 35, BRIDGE STREET, HEMEL HEMPSTEAD, HERTS HP1 1EE.



also useful even if the model is to be flown free-flight as it is a good device for preventing damage in a crash!

The fuselage is built around a $\frac{1}{4} \times \frac{3}{8}$ in. hard strip balsa crutch. Pin this balsa to the plan view and add the upper half formers F2A to F9, omitting the top part of F8. Cut the tailplane from medium $\frac{1}{8}$ in. balsa, sand to section, separate the elevators and then hinge to tailplane with tin plate strips. Cement tailplane to F7, F7A and F8 and slot $\frac{1}{8}$ in. sheet fin and rudder in position after separating and hinging rudder. (Use tinplate not stitching if for F/F.) Remove fuselage from plan and then add the bottom halves of the formers F2A to F9. If a beam mounted motor is to be used, check the motor spacing between bearers, face F1 and F2 with ply and cement with bearers to F2A. If a radial mounted motor is to be used, omit facing ply on F2 and install former FB after drilling motor bolt holes. The tailwheel assembly is formed from 18 swg. wire pushed through then bound and epoxied to the $\frac{1}{8}$ in. ply strip; this slots into F8 and F9. The fuselage is now ready for planking with medium $\frac{1}{8}$ in. sheet, in convenient width strips, from F2A to F9. The extreme tail cone is from scrap block and the space between F1 and F2 is best filled in with soft block balsa. When fully planked and sanded smooth, cement a 1 in. wide strip of $\frac{1}{8}$ in. balsa between F2A and F4 to provide a strong seating for the wing. Trim to wing upper profile after assembly.

A scale canopy can be built up or moulded but a good compromise is possible with an 8 in. *Micro Mold* canopy with lines painted on to represent the original metal parts of the canopy. Finally, sand the fuselage to a smooth finish and dope on lightweight tissue. Add wing dowels. Now is the time to install the R/C equipment if desired bearing in mind the final C.G. position.

Wing construction is quite straightforward. Cut out a complete set of ribs, main spars and leading and trailing edge. Make the port panel first, pinning the main spar in place over the plan, together with the notched tapered trailing edge (which must be packed

up to suit the rib sections) and dihedral braces. Slot ribs in place, making sure that they are aligned correctly. Add leading edge and tip piece, then when dry remove from board and add the grooved U/C block. Pack up to suit dihedral angle, then build starboard panel in same way. Sheet centre section with $\frac{1}{8}$ in. sheet.

Cover the wings with lightweight tissue, and apply three coats of thinned dope, taking care to avoid warps, then apply colour scheme – keeping this as thin as possible. The original model was based on the drawing in the *Aeromodeller* plan pack No. 2768, price 40p and use the colour scheme detailed thereon.

Make up the U/C legs and 'doors' and retain in position with wood screw heads (this allows them to fall free in a 'hard' landing without damaging the structure) and check the C.G., ballasting if necessary (or move batteries around if R/C).

As for flying – there are no hidden vices in this low model, just use 'standard' F/F trimming techniques. If flying R/C there seems nothing to be gained from glide testing – but check the C.G. position and that the rudder has no more than $\frac{1}{8}$ in. movement each way for 'bang-bang' control – then fire the engine and away you go! The elevator may be used for trim changes, but only alter it a little at a time as it is quite a 'powerful' device – and we don't really want any aerobatics!



RFB (Lippisch) X 113 Am *continued from page 490*

those of the afore-mentioned types of vehicles, the Aerofoil boat requires 30 per cent less power. In addition it offers improved manoeuvrability and tighter turning radii as compared to conventional air-cushion vehicles, not to mention its ability to fly like any other plane.

Aerofoil boats could be used to advantage for a variety of civil and military duties, with types ranging in size from a modest single-seater to transports with payloads of up to 10 tons, for operation in coastal waters and similar environments. Adaptation to land-based or amphibious operation would, of course, be possible too.

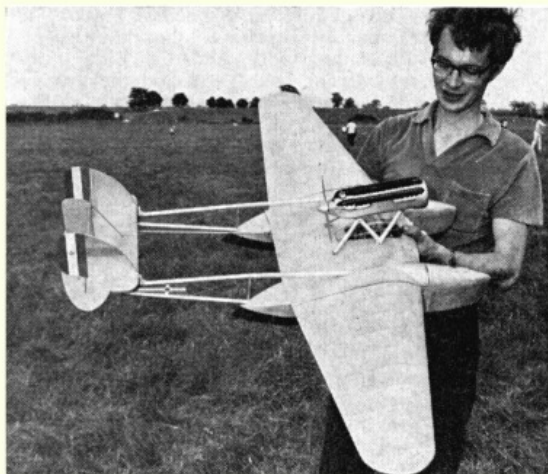
Technical data X 113

wingspan	5,89 m = 19 ft. 4 in.
length	8,43 m = 27 ft. 8 in.

height	2,07 m = 6 ft. 9½ in.
weight empty	255 kg = 562,3 lb.
max. T.O. weight	345 kg = 760,7 lb.

Modellers planning to build an R/C Scale model of the X 113 (colour finish: none, the craft retains its natural glass fibre plastic yellow-brownish colour) should remember that all air-cushion vehicles are only stable while hugging the ground closely! The Aerofoil boat in its model version seems to offer similar properties, as exemplified by the pitch-up tendencies of the three test models and of an earlier rubber-powered F/F model of the forerunner, X 112, built several years ago. These difficulties are caused by the fact that the centre of pressure of the ram wing operating in ground effect lies aft of that of the wing-cum-tail com-

bination when in flight. With the model trimmed for flight in ground effect the C.G. shift occurring when the model leaves that zone makes it tail-heavy, hence the pitch-up and stall. A tandem configuration with its front wing operating in, the rear wing operating out, of ground effect (or nearly so) may be an answer to this problem in the case of a freelance design, provided the C.G. positions coincide properly. Use of a T-tail configuration in conjunction with an all-moving tailplane (stabilator) and perhaps a front-mounted trim vane (as used on the earlier X 112) may well prove worthwhile for a scale model of the X 113. It should make a most fascinating experimental modelling subject which is easy to build, may be operated off any lake, provides a real technical challenge and looks so wonderfully 'different' for a change. . . .



IT WAS NICE to attend the Nationals once again in the county of my birth – Yorkshire; only the second time since this most popular event in the British aeromodelling calendar was established just after the war, the previous occasion being at Clifton Aerodrome, York, in 1950. I attended that event on my sole means of transport in those days – you've guessed it, my bicycle! Of course, there were no scale events at the Nationals then. The sight of a camouflaged object vaguely representing a scale model, hurtling round on the end of a pair of wires was reasonably common, a free flight scale job much less so and radio controlled models were just a dream in every scale enthusiast's eye. How things have changed in the intervening 23 years! Now we have two classes of R/C models together with C/L and F/F still well supported; nearly 70 entries were made in the scale events this year.

I have a particular fondness for Lindholme. Not so much for the aeromodelling connections, as apart from flying in the Northern Area Rally these are precious few, but rather for its historical significance to me. Opened in the early war years as Hatfield Woodhouse, after the nearby village, the name was changed to that of the surrounding peat bog to avoid confusion with the famous de Havilland field. It soon formed part of my 'bomber circuit' to be 'inspected' regularly by cycle. I was still visiting the 'drome annually throughout the 50s and early 60s for the R.A.F. 'At Homes' to celebrate the *Battle of Britain* each September. Lindholme was the last R.A.F. station to operate four engined 'heavies' – the venerable *Lincoln*. Always the flying display was terminated with the traditional 'bombing the fort' by a squadron of these impressive machines. At these displays I also caught my first glimpse of the Shuttleworth *Pup* and '504K' – a greater contrast between their aerobatics and the *Lincolns* could not be imagined.

Enough of reminiscences of the long gone past, and let us reflect upon the latest Nationals. As most readers will by now be aware, the D.H.9a of yours truly won the 'Super' this year; chiefly due to its ability to 'rise-off-ground' under difficult conditions. Moral victor surely though must have been Terry Manley's H.P. 0/400 – great credit must go to Terry for flying this huge twin in the windy conditions prevailing. He must dearly have liked to have left it in his car and flown the D.H.4 again, but so many

FLYING SCALE COLUMN

by ERIC COATES

Derek Collins with his most impressive Savoia Marchetti S-55X which took the second-place prize at the Old Warden Scale Meet. Sea-planes took all three places in F/F – despite the lack of rain!

people had come to see the Handley Page perform that he hadn't the heart to disappoint them! I think all the people who saw this machine in flight and depositing its bomb into the R/C landing circle, must agree with me that it was the most impressive scale flight at the Nationals. As John Palmer said, 'He deserves a prize just for flying it'. I hope we see a lot more of it at meetings later this year; in calmer conditions.

Talking of calmer conditions, on reflection, it was rather ridiculous that both rounds of the F/F scale event were flown when the wind was at its roughest – around noon and 5.00 p.m. on the Sunday. I think it is about time that at a two (nay three this year) day meeting like the Nationals, the flying times were modified somewhat. It is a well-known fact that winds are nearly always at their freshest in the afternoons whereas there is a very good chance of calm conditions in the early morning and late evenings. I think the F/F duration boys pointed the way this year when, due to complaints of crop damage caused by the retrieval of models blown out of the airfield on the Sunday, it was decided to start Monday's

Yes, it is big! A. C. Jansen displays the 65 in. span version of the Dornier 18 Flying Boat which turned so many heads at Old Warden, resulting in his winning the top prize for F/F. Made many low-level sorties over the surrounding woodland.



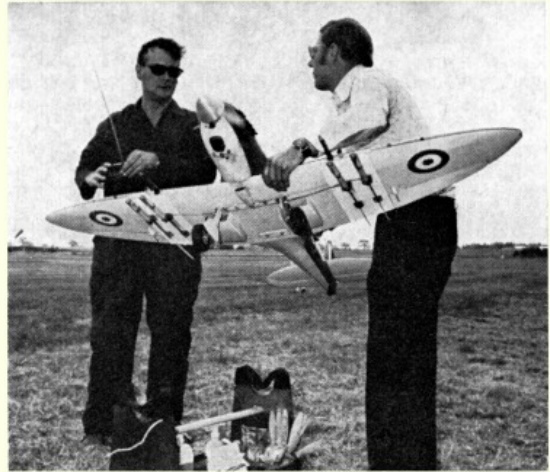
The R/C ride was as well supported as ever (nearly 60 people flew) and these models will be described in the September issue of *Radio Control Models & Electronics*. Here, P. J. Bentley of the Knutsford club pre-flight checks his rocket-equipped Spitfire IX. Model was certainly spectacular and popular as only the 'Spit' can be - but if only those legs could be retracted. . . .

activities at 5.00 a.m., before the wind came up. Of course thanks to 'Murphy's law' the wind did not blow very hard at all on the Monday, but that is beside the point. Why not arrange, next year, the first round of F/F scale for 8.00 p.m. on Saturday, with a provision to postpone to say 7.00 a.m. Sunday morning if blowing, and the second round for 8.00 p.m. on Sunday, with a similar postponement provision to 7.00 a.m. Monday? At least that way we should have a far better chance of seeing models like the 0/400 perform in their true element - flat calm.

I can see that there will be difficulties in organisation and moans that the times are not suitable for spectators, but I think the competitors, with the class of model which is more susceptible to the elements than any other, deserve more consideration in future rather than being led like lambs to the slaughter at the traditional time. I would very much like to hear the views of competitors on this subject; if there is sufficient support for these ideas, then perhaps next year's events can be organised differently.

Apart from the two F/F sessions, when I was rather pre-occupied with my own flights, I had precious little time at the 'Nats' to see many other flights, for both Terry Manley and myself were buried in a little room in the hangar, static judging the 34 entries in Class I and II scale R/C. I think the standards here were more extreme than ever this year; there was no demarcation between the class as the best Class II jobs were up with the tops in Class I for workmanship and accuracy whereas the bottom of Class I was just as rough as the worst of Class II!

I was sorry Roy Scott could not stay to have his *Tiger Moth* judged. This looked a real beauty. I think the 'Tiger' must be the most abused scale subject there is - how often you see them charging around the skies, at a scale speed of 400 m.p.h., with wings as thick as three planks! The cowling shape also seems to be invariably wrong. Roy captured the atmosphere of the original perfectly and I am sure that when this model is kitted it will be a real success, and will do something to restore the virtue of this aristocrat of trainers.



Old Warden '73

Sunday, 17th June, saw a very different affair to the Nationals - the *Aero Modeller/Scale Models/R.C.M.&E. Scale Meeting* held at Old Warden, Bedfordshire, home of the Shuttleworth Collection. Picturesque though it is, Old Warden is really far from the perfect flying site for F/F scale, being rather too small and bordered along one boundary by woodland. Nevertheless it has a unique atmosphere and attracts more flyers than any of the S.M.A.E. events. Because of the high risk of striking an obstacle (or even another flier) the best machines tend to get left at home, or sit on the ground all day. Even so, many interesting creations are to be seen airborne almost continuously.

I was asked to Judge the F/F section this year. This I find to be a very enjoyable occupation as it enables me to get to know and chat to the many readers of this column whom I would not normally meet. I was gratified to learn that most people seem to like the mixture of the column as it is. There are many facets of F/F scale modelling, which I try to cover as fairly as possible, although this to some extent must reflect my own current personal interests and the correspondence I receive. I also try to leaven the offerings with a little R/C and, I am afraid, even

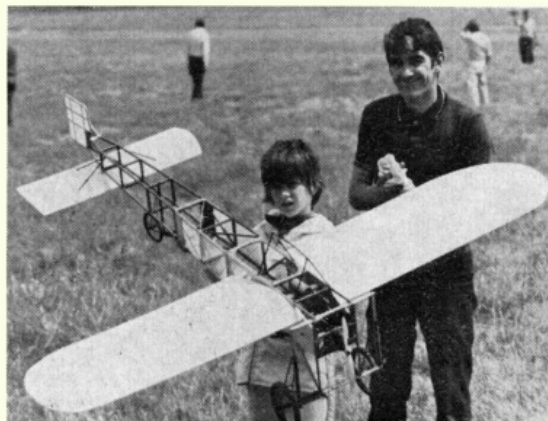


And that is enormous! Jim Leddy (left) and Mike Ennis struggle with the bulk of their Messerschmitt Me 264. Span is 126 in. and it weighs 27 lb., so there should be plenty of 'feel' down the control-lines when it gets airborne! Model has two bellcranks - one for each pilot to control the various functions - and should certainly be spectacular. Canopy was moulded around a 1,000-watt light bulb. Anything on the building board for next year, lads?



less C/L. Not being active nowadays in the latter class and receiving very little correspondence from the circulators, this is a reflection on my information on the subject. . . .

It was rather flattering to see so many of the 'Coates Column' ideas incorporated into numerous models present. Perhaps the 'Scale Column 'Oscar' should go to Bill Costin of Solihull who incorporated just about them all in his 1/12th scale *Avro 504K*. Evidently the *Marks and Spencer* Hamburger tin was produced with the cowl of 1/12th scale *Avros* in mind, for very little modifications are necessary to convert for this purpose. Bill also passes on a useful source of supply for tyres, suitable for scale models: Messrs. Rubber and Plastics Industries of 27 Alcester Street, Birmingham B12 0PL. Evidently they have large stocks of rubber rings in many sizes, suitable for our purpose. They are also prepared to make special sizes to order, so for anyone with a wheel problem, living in the Midlands, a visit to their premises could prove fruitful. Whilst on the subject of wheels I am informed by M. Newall of Leas that Handicrafts Ltd. of Peterborough PE1 1UD make similar wheels to the old *Hobbies Ltd.* metal jobs which had good replicas of Palmer Cords fitted to them. Sizes available are 2, 3, 4 and 5 in., which, with prices varying from 5p to 15p, can't be bad!



Third seaplane to gain 'honours' at Old Warden was the *Blackburn Baby* built and flown by Mr. Hibbert. All these nautical machines certainly overcome the problem of finding suitable wheels for your latest scale project!

To return to the old Warden meeting. I had no difficulty in awarding first F/F prize to Mr. A. C. Jansen. His 65 in. span *Dornier 18* flying boat being one of the most majestic models I have seen airborne for a long time. Marginally underpowered by a Frog 3-49, its low level sweeps over the crowds, caravans and surrounding woodland proved to be real crowd stoppers. This is a prototype I seriously considered myself at one time; using a pair of smaller diesels rather than have a windmilling rear propeller as Mr. Jansen has. Mr. Jansen also had an impressive all red Bristol MIC monoplane making regular flights.

I awarded second place to another flying boat the Savoia-Marchetti S-55X of Derek Collin, powered by a pair of Albon Darts. After one engine cut the machine descended to earth slowing with a peculiar rapid-pitching motion, probably due to an over-sensitive pendulum elevator control. It looked very impressive in the air with its large chord wing and spindly tail booms.

To conclude a trio of nautical prizewinners, third prize went to Mr. Hibbert with his *Blackburn Baby* floatplane. This impressed me at last year's meeting and more so this year with its almost aerobatic performance. Mr Hibbert also flew yet another flying boat - a *Walrus*. There is no doubt that flying boats make ideal subjects for flying over grass fields although if they do land on a runway, the planing bottom is not exactly improved!

Several rubber jobs were in evidence although the windy conditions didn't help them very much. Frank Green's 28 in. span *Blackburn Skua* flew well and consistently all afternoon but most impressive was the diminutive *Waco Custom Bipe* of Andrew Moorhouse. Built very lightly, from pre-war *Megow* plans, this little machine flew so well and so often that we felt that we had to give it a special prize!

Most popular model, as usual, was the 1/12th scale S.E.5a to Doug McHard's design - it was very seldom that at least one of these little machines was not airborne. Award for the most consistent prancing must go to Derek Hughes' *Ryan P.T.*, I have never seen a model bite the dust so often, fly apart and be airborne again a couple of minutes later!

Largest F/F model present was the 75 in. span, quarter scale *Bleriot Monoplane* of Denis Binnie. Not surprisingly, in view of the breezy conditions, he did not attempt to fly it but the models should perform very realistically on a flat calm evening and I estimate that its AM25 should pull the 2 lb. aeroplane along at about 6 m.p.h. The problem with Bleriotics is getting the C.G. far enough forward, and I noticed a considerable amount of lead ballast around the nose of Mr. Binnie's machine. He told me it was originally rubber powered, but that the 24 strands of 1/4 in. Pirelli had proved too much for its gearbox! I should imagine that as a rubber model the C.G. problem would have been insuperable.

For sheer spectacle in the control-line area, no-one could touch the products of the **Guildford Model Flying Group**, and it was for these efforts that the club itself, rather than an individual, was awarded

Denis Binnie's *Bleriot Monoplane* spans 75 in. yet weighs just 2 lb. - quite an achievement. However, with such a light wing loading and modest power (AM 25) the conditions were a little too windy for flight at Old Warden.



Another Mike Ennis C/L project - a Hustler B58 powered by four PAW 19s (although only two fitted at the moment). Model as yet unflown, but is designed to take-off from a 'dolly' and has reinforced nacelles to take landing shocks. Weighs 5 lb.

the Jack Carter Trophy. Best crowd stopper of all was a group project, begun by Jim Leddy and Mike Ennis, which consisted of a 1/12th scale Me 264 VI. When one realises that this scale results in a model of some 126 in. span, weighing 27 lb. (!) and powered with four Super Tigre 35s then perhaps one can understand the adjective 'spectacular'! It is fitted with retracting undercarriage, operating flaps and bomb doors, and is equipped with two sets of controls. Pilot No. 1 is responsible for flying - having elevator and throttle controls, while Pilot No. 2 (Flight Engineer?) operates the flaps, undercarriage and bomb release. The machine has yet to be flown - it was only just completed before the 'do', and broke the undercarriage during a trial period the night before.

Another of their models was a Hustler B58 - again a Mike Ennis project - which is fitted with four P.A.W. 19s. The whole is finished in Holts 'Steel Wheel' spray, followed by a coat of polythene fuel proofer. A drop-off undercarriage is provided for this 5 lb. model, but again lack of time prevented it from being test flown beforehand, and despite everyone's efforts, it failed to make a 'maiden'. Next time! In addition, Mike brought along his Me 163 and Me 262

Very fine 1/4th scale Albatros of D. Ashfield won a prize in the control line category. Finished in the 'Bavarian Lion' insignia, this slow-flying model looked most realistic in the air. Merco 35 R/C powered, it weighs just 4 lb.



which are proven fliers, and which were seen at last year's meet.

John Skinner's PZL Wilga, which was described in the Nationals report last month, was flown nicely by its owner, and the general standard of construction and finish was well ahead of the other models present, earning him first prize. He deserved a prize for flying such a beautiful machine over grass! Another to impress the judges was D. Ashfield's 1/4 scale Albatros which featured a fuselage made from panels of 1/32 in. ply in the same manner of the full size. Flew nicely with its throttled Merco 35. The Shuttleworth Trophy for the best model of an aircraft featured within the Museum was once more awarded to Mick Staples; this time with an immaculate, though rather small, version of the D.H.60 Moth. A larger scale and he could have 'lost' the engine's cylinder head easily within the cowl. . . .

Above all the C/L boys enjoyed themselves - which is what it's all about - and even if the standard of construction/finish was not too high in every case, at least plenty of enthusiasm and variety was in evidence!

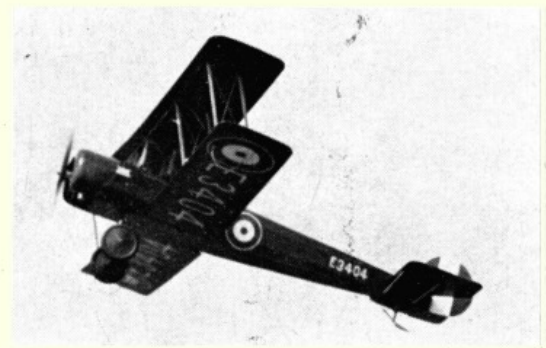
* * *

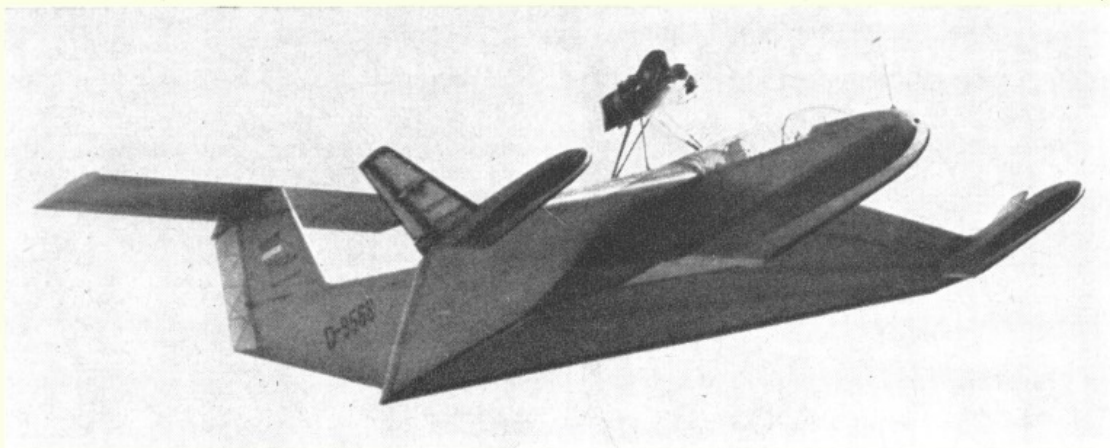
Generally the weather has been much more favourable this year to the scale-modeller; many long calm evenings being a joy to behold during the mid-summer period. Let us hope such weather continues for the events in the latter part of the season. There are quite a number in various parts of the country. For the benefit of the F/F enthusiasts these are as follows:-

August 26th	N.W. Area 'Woodford' meeting. 'Eddie Riding Memorial Trophy.'
September 2nd	Northern Area Rally at Elvington near York. 'Selby Trophy'.
September 30th	S.M.A.E. 'All Scale Meeting' at Little Rissington. Also R/C Class 1 and C/L.
October 8th	Southern Gala at Odiham, Hants. F/F and Class II R/C.
November 4th	S.M.A.E. Indoor scale meet at Bridge Norton, Oxfordshire.

In addition for indoor enthusiasts meetings will be held by the S.M.A.E. at Cardington on September 9th. Entrance to the hangar is strictly limited to S.M.A.E. members. Prior notice must be given to Laurie Barr, of 4 Hastings Close, Bray, Berks.

This 1/12th scale F/F Avro 504K incorporated a large preponderance of 'Coates Column' ideas, 'winning' its owner Bill Costin a non-existent Oscar! Cowl is made from a Marks and Spencer's hamburger tin.





AIRCRAFT DESCRIBED No. 223

RFB (Lippisch) X 113 Am AEROFOIL BOAT

a fascinating project detailed by HANS JUSTUS MEIER

THE BIZARRE-LOOKING vehicle that was tested on, or more accurately over, Lake Constance, may well become, among other things, one of the most promising shallow water transports of the future. It's a flying boat type craft with a heavily anhedralled, delta-shaped wing, with the apex of the delta facing aft, and turned up wing tips carrying small ailerons. That is how the Aerofoil boat X 113, designed by Prof. Alexander Lippisch and built by *Rheinflugzeugbau*, a subsidiary of VFW-Fokker of Bremen, could be described.

Despite its name, the X 113 is *not* a boat, rather a full-fledged aircraft, which makes effective use of the ram effect of its unique wing.

It all started nearly 11 years ago, in 1962, when Prof. Lippisch, then living in the U.S.A., became intrigued by the queer behaviour of ultra-fast racing boats which sometimes seem to prefer flying through the wild blue yonder to staying in their natural element. In order to enhance and possibly exploit that tendency, Lippisch equipped his 'boat' with a buoyant wing and control surfaces. The result was the X 112, a hydroplane of sorts (it takes off from, and alights on, water), but one offering a glide ratio in ground effect far superior to anything achieved by conventional powered planes; a bonus resulting from the ingenious method of trapping air between its wing and the surface of the water.

This test vehicle proved an immediate success. It was flown by

several pilots who were unanimous in their praise of its excellent handling qualities and amazing stability. It was the choice of a balsa-sandwich type of construction that proved to be its early undoing. After several weeks of operation it sprang some leaks, the balsa wood became thoroughly soaked with water, the airframe warped in a most frightening manner and, as a result, the 'old' bird had to be retired. Rumour has it that it is now collecting dust, resting below the roof of a hangar in the U.S.A.

Unusual configuration of the X 113 makes it look like something out of science fiction, but as the photographs show - this is no figment of the imagination. Prototype was on display at this year's Paris Air Show.





In 1967 Prof. Lippisch renewed his experiments, but this time in Germany. Three radio-controlled models of about 80 in. wingspan were built and tested, using commercially available R/C equipment. These tests indicated certain difficulties which had not

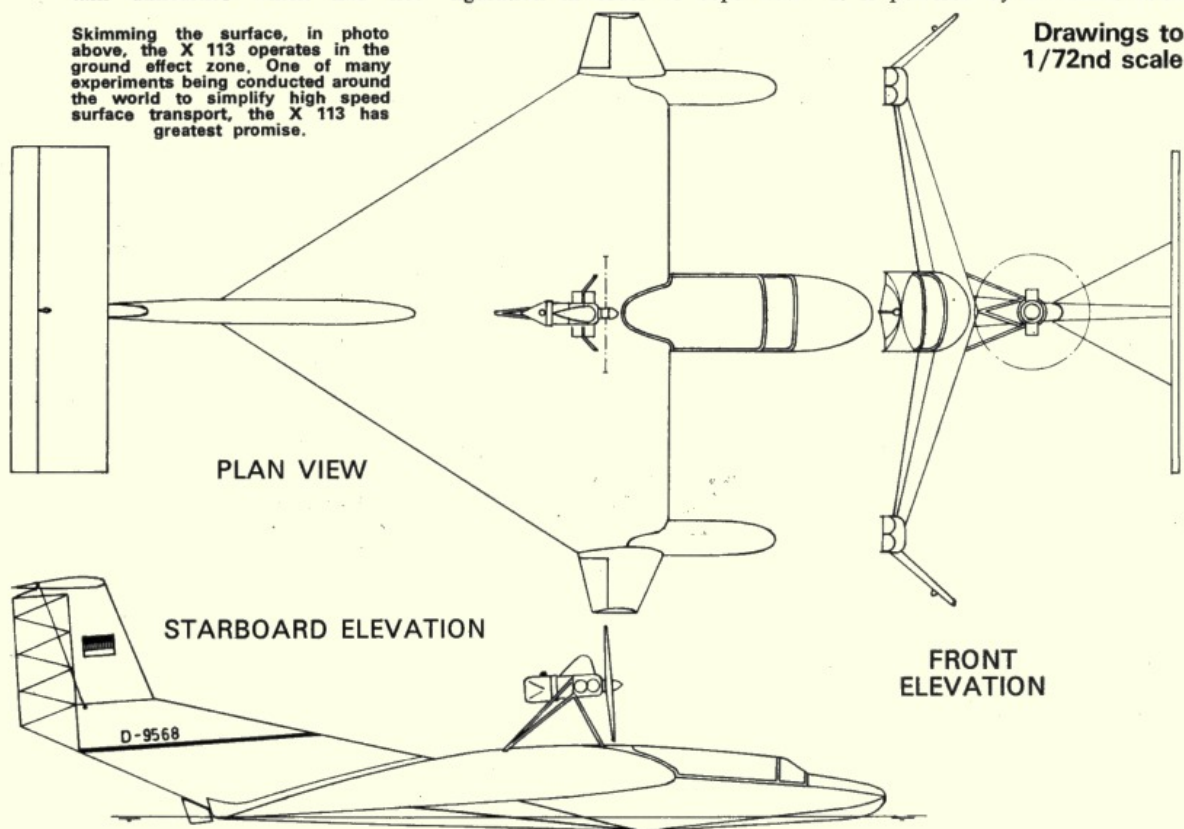
been encountered in full-size tests: a pronounced tendency to pitch up when leaving and entering the ground effect zone.

As a result of these experiments and wind tunnel tests the empennage was changed to a T-tail configuration in order to cope with

the pitch-up.

Based on the experience with these three models and the earlier X 112, a scaled-down version of a projected four-seater was built as the single-seater X 113 which was completed in the autumn of 1971. It is powered by a Nelson H-63

Skimming the surface, in photo above, the X 113 operates in the ground effect zone. One of many experiments being conducted around the world to simplify high speed surface transport, the X 113 has greatest promise.

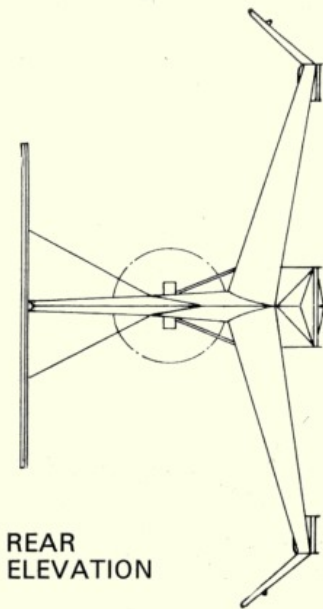


Drawings to
1/72nd scale

PLAN VIEW

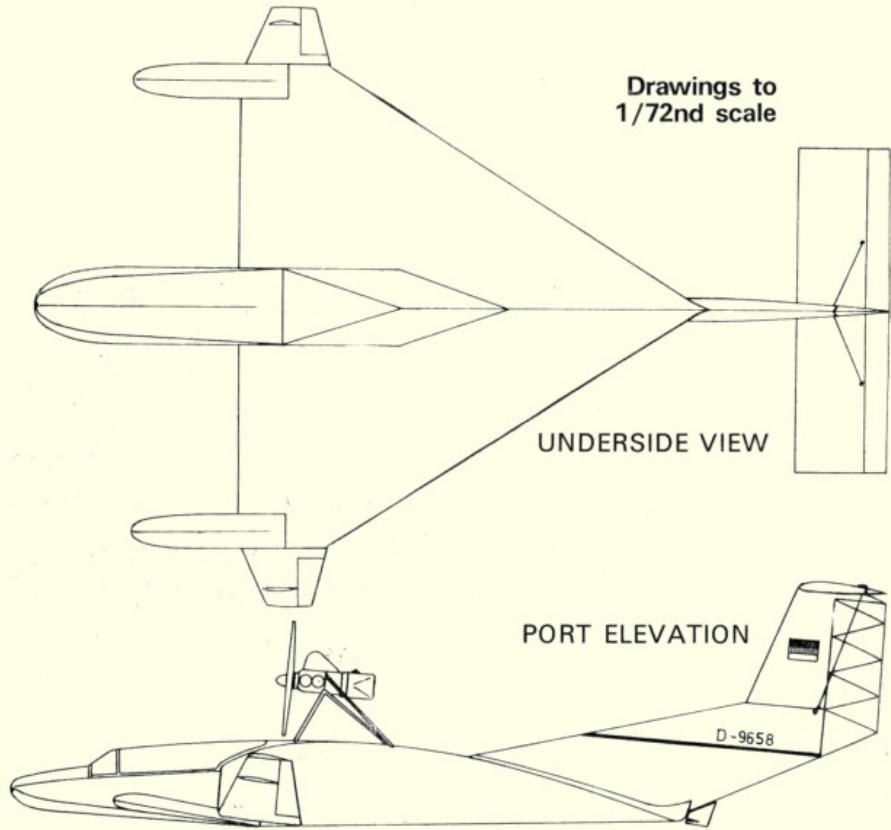
STARBOARD ELEVATION

FRONT
ELEVATION



REAR ELEVATION

Model tests define the tail configuration and modellers might well wish to adapt these 1/72nd scale drawings to make their own surface skimming craft. Colour of prototype was off-white.



Drawings to 1/72nd scale

UNDERSIDE VIEW

PORT ELEVATION

CP air-cooled engine of 48 h.p.

In order to avoid the trouble encountered with the airframe of its forerunner, the X 113 uses a glass fibre type of construction. The auxiliary floats sport styro-foam cores, while the central float and tailboom are made of Conticell sandwich. A special type of tubular plastic monocoque construction is used in the case of the buoyant wing which renders the vehicle practically unsinkable.

During early test flights, pilot Wolfgang Spaete (of rocket-fighter fame) cautiously tried short hops only, but after a short time he took the bird up for flights of 30 minutes' duration, gradually increasing the height of his flights to 300 ft. and more, *i.e.* well out of ground effect.

In the ensuing flights the X 113 has been thoroughly tested with a variety of centre of gravity positions to fully explore the flight envelope. Spaete became so familiar with the craft that he was soon able to fly it hands-off. The pitch-up experienced with the earlier R/C models did not make itself felt in the case of the X 113, which permitted re-positioning the tailplane (now set much lower).

If the approach is made steep

and slow (approx. 45-55 knots) the X 113 must be flared out when alighting; if it is flat and slightly faster (60 knots plus) the vehicle settles down on its own, requiring no pilot-induced flare-out.

Depending on the speed regime, an Aerofoil boat operates either as

a displacement boat (at very low speeds) or in the manner of a hydro-planing one (8-30 knots) or as an air-cushion vehicle (30 knots plus); while its efficiency and transport capability are superior to

continued on page 483



1959 example of British-made Mills 75 (centre) flanked by Indian version (left) and the Doonside-Mills made in Australia.

latest engine news

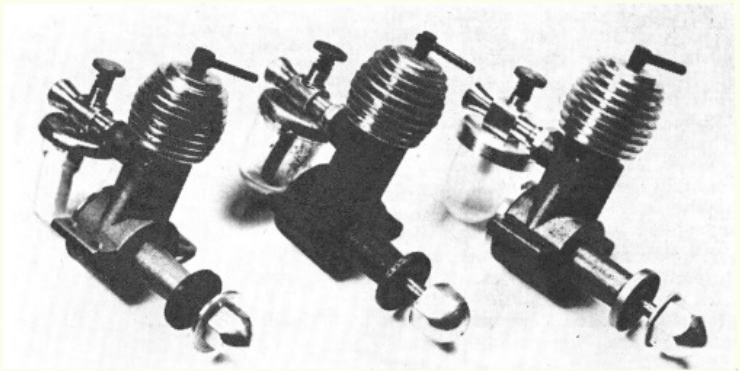
by Peter Chinn

Twins – Old and New

Northfield-Ross Twins are now being imported from the U.S.A. by Henry J. Nicholls & Son Ltd., who are offering them direct to retail customers at £65 each. The Ross is unquestionably the best commercial 10 c.c. twin-cylinder motor to date and is not really expensive when one has looked at what goes into its construction and compared it with the typical single-cylinder 10 c.c. motor.

The Ross Twin was first put on the market three years ago. Details and test results were published in the October and December 1970 issues of *Aero Modeller*. Since that time, some improvements have been made and the current models are claimed to substantially better the performance of our test sample.

Twin-cylinder model motors are still quite rare, during the immediate pre-war and early post-war period, several such engines appeared in the United States. One of these was the Viking-Twin, made by the Macval Manufacturing Company of Burbank, California. We do not have one of



these in our personal collection of vintage model motors but, a few months ago, Cliff Petty, who is a keen collector of model engines both ancient and modern, kindly sent along, for inspection, a Viking that he had recently acquired.

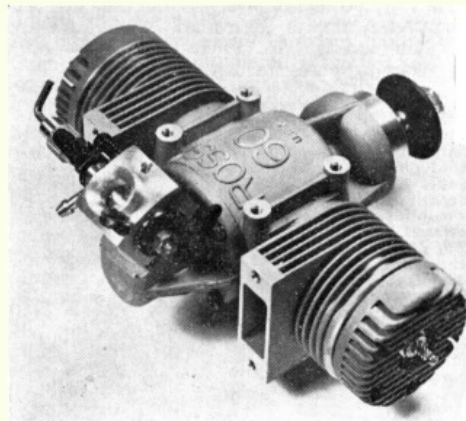
This engine, built 25 years ago, appeared to have been scarcely used and was in virtually new condition. It made a most interesting contrast with the Ross Twin, serving to emphasise how much the standards of model engine design and construction have improved and how good the Ross really is.

Both engines are, of course, alternate-firing, horizontally-opposed units. They both have cross-flow scavenged cylinder porting and rear shaft-valve induction with detachable rear housings and a one-piece, two-throw, two-journal crankshaft, but beyond this, they have little in common.

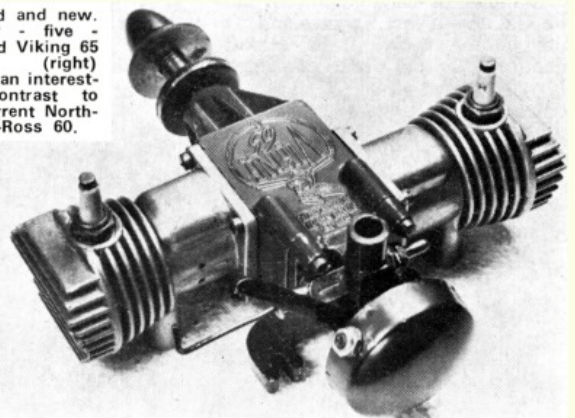
The Viking crankshaft, for example has $\frac{3}{8}$ in. o.d. journals supported in plain bronze-bushed bearings front and rear with just a ball thrust bearing at the front, whereas the much more rigid Ross

shaft has $\frac{1}{2}$ in. journals carried in three $\frac{1}{2} \times 1\frac{1}{4} \times \frac{1}{4}$ in. ball journal bearings, two at the front and one at the rear. Separate cylinder castings with integral heads are used by the Viking. These are each attached to the rectangular section diecast crankcase with four screws and, in the usual flat-twin manner, are offset so that their axes are in line with their respective crankpins. The Ross, on the other hand, has a single investment casting embracing the crankcase and both cylinder casings, these latter being on a common axis, with offset conrods used to line up with the crankpins. Cylinder heads are, of course, detachable, as are the cylinder liners.

The bore and stroke dimensions of the two engines are not very different: the Viking has a nominal bore and stroke of 0.812 x 0.625 in. for a swept volume of 0.6473 cu. in., or 10.607 c.c., and the Ross is 0.800 x 0.600 in. giving a displacement of 0.6032 cu. in., or 9.884 c.c. However, while the Ross uses Dykes-ringed machined aluminium pistons, the Viking is of the ringless lapped piston type. The pistons, incidentally, instead



The old and new. Twenty-five-year-old Viking 65 Twin (right) makes an interesting contrast to the current Northfield-Ross 60.



of being machined from cast-iron, as is most common with lapped piston engines, are produced from steel stampings. The connecting-rods have strap type big ends on the Viking, in contrast to the Ross which has detachable half-caps each secured with two cap screws, more in the manner of a full size engine but without separate bearing shells.

Two major operational differences between the two engines are that, whereas the Ross is of the glowplug ignition type and is provided with a throttle type carburettor, the Viking belongs to the spark ignition era. Although it has no throttle, a measure of speed control is obtainable by means of the contact-breaker advance and retard lever at the rear.

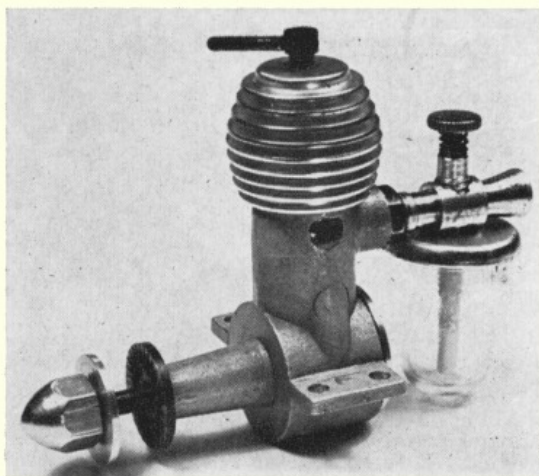
Compared with the Ross, the Viking looks (as did most of its contemporaries) quite flimsy, so it was quite surprising to find that, at nearly 14.7 oz., it was only a quarter of an ounce lighter than the Ross. Adding the necessary ignition coil, condenser and battery would, of course, bring the Viking's flying weight up to around the 20 oz. mark.

So far as performance is concerned, the Viking was rated, by the manufacturer at $\frac{1}{2}$ h.p. at 8,500 r.p.m. This is, one feels, a somewhat optimistic figure and we would be very surprised if the Viking developed more than 0.35–0.40 b.h.p. On a power/weight rate basis, the Ross 60 Twin almost certainly delivers $2\frac{1}{2}$ to 3 times the power of the Viking with infinitely greater reliability.

Indian Mills 75

As reported last month, this Indian made copy of the Mills P.75 is being imported into the U.K. by Irvine Engines and, as our photos show, it is almost identical to the late lamented

This Indian-made replica of Mills P.75 is now being imported into the U.K., which should please Mills fans.



Mills, both externally and internally. In fact, the only ways in which it seriously differs from the original are in its crankcase material, which is of an aluminium, rather than a magnesium alloy, and its backplate which is machined from bar stock instead of being cast.

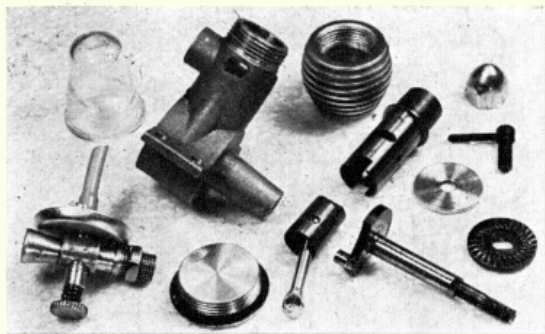
Just a year ago in L.E.N. we dealt with the Doonside-Mills Project initiated by Ivor F. Stowe of Doonside, New South Wales, which, it may be recalled, resulted in the construction of 1,000 Mills 75 replicas, the parts for which were made by the well-known Australian model engine firm, Gordon Burford & Co., manufacturers of Taipan motors.

Comparing these two replicas with the original P.75, the Australian version emerges as the best of the three from the construction standpoint but the Indian motor is quite well made and is closer to the original in detail.

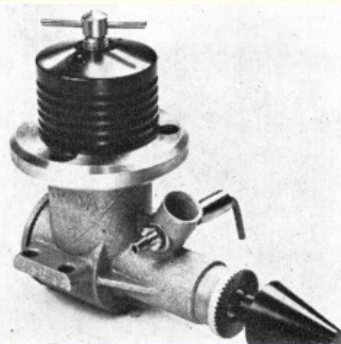
To recount briefly the features of the Mills P.75, this is a 'vintage diesel' design with a very

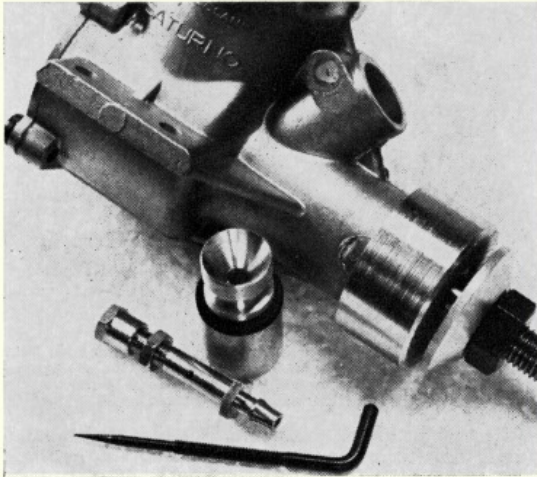
long stroke (nominal (S/B ratio 1.576) and induction via a piston controlled port at the rear of the cylinder. The carburettor, complete with simple bowl type free-flight fuel tank hung beneath it, is screwed into a boss which communicates directly with the intake port. The long skirted piston has a deflector step in the front edge of the crown to uncover the two small transfer ports and exhaust is through ports on each side. The hardened crankshaft has a $\frac{7}{8}$ in. dia. journal and runs in a bronze bushing. A machined dural conrod couples the $\frac{1}{2}$ in. dia. crankpin to the piston, the gudgeon pin being pressed in. The hardened cylinder liner is located in the casting by a flange and is retained by a screw-on machined cooling jacket.

Because it uses an aluminium rather than a magnesium crankcase, the Indian Mills is a trifle heavier than the British original. Checked weights of the two examples examined were 2.02 oz. and 1.76 oz. respectively – both figures inclusive of fuel tank.



Left, Parts of the Indian Mills 75. Engine is built with the original Mills tooling. Right, Russian Sokol 2.5 diesel, described in last month's article, now has a sandblasted casting finish with black anodised cylinder jacket and spinner-nut. Annular type exhaust silencer is a British made option. Engine and silencer both available from The Modellers' Den Ltd.

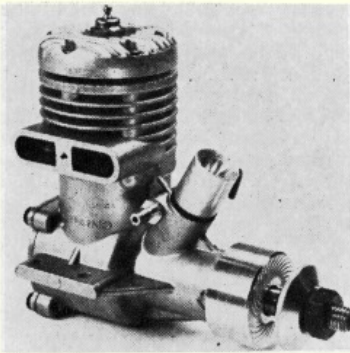




One unusual feature of ST.35 (seen below left) is its tiny venturi throat - only 7 sq. mm. - with multiple jets.

Originally this was 4.5 mm., giving a choke area of 15.90 sq. mm. Now, the venturi has been considerably lengthened, has a 5 mm. i.d. for approximately 10 mm. of its depth, but is then abruptly reduced to only 3 mm. i.d. (7.07 sq. mm.) at the jets. Clearly, this is bound to result in much improved fuel suction.

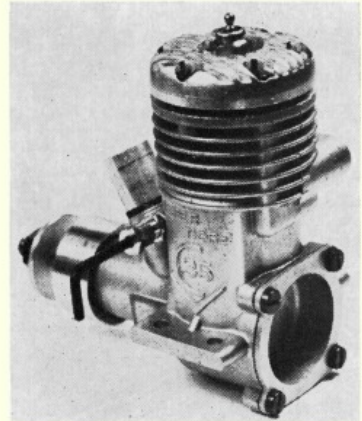
Typically Super Tigre, the ST.35 is a soundly engineered motor, strongly made (the mounting lugs could do with being a little thicker, though) and well finished. It has a bore and stroke of 20 x 18 mm., giving a swept volume of 5.655 c.c. or .3451 cu. in. On test, our original motor returned a power output of just under 0.55 b.h.p. at between 12,500 and 13,000 r.p.m. on standard low nitro test fuel and without a silencer. This, as it happens, is almost identical with the maker's rated output of 0.55 b.h.p. at 13,000 r.p.m. for the current version with smaller venturi. The weight of this latest model is very slightly higher at a (checked) 224 grammes or 7.9 oz.



stunt engine. This is actually one of the Italian factory's oldest motors (its origin dates back to 1961) but has not changed very much over the years. The same casting, with minor modifications, is still in use but the current model can be identified by its cup type prop driver and longer venturi insert.

The engine has a strictly traditional stunt 35 layout: to wit, a one-piece body casting with plain (bushed) main bearing, a lapped cast-iron piston running in a steel liner, shaft rotary-valve induction and conservative crossflow scavenging.

Unlike most stunt 35's, the Super Tigre does not have the spraybar passing through the choke. Instead, it passes through the rear of the intake boss and feeds into the venturi via four peripheral jets. This is the same as was used on the earlier versions of the ST.35 but a significant change has been made to the venturi size.

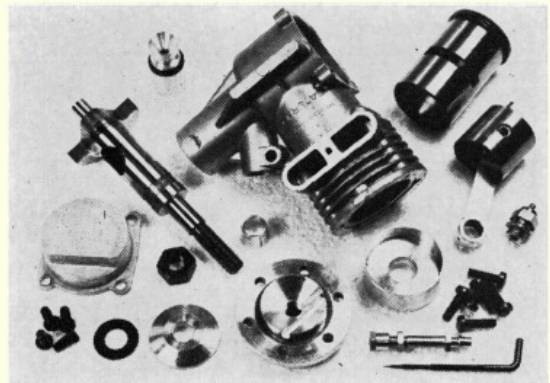


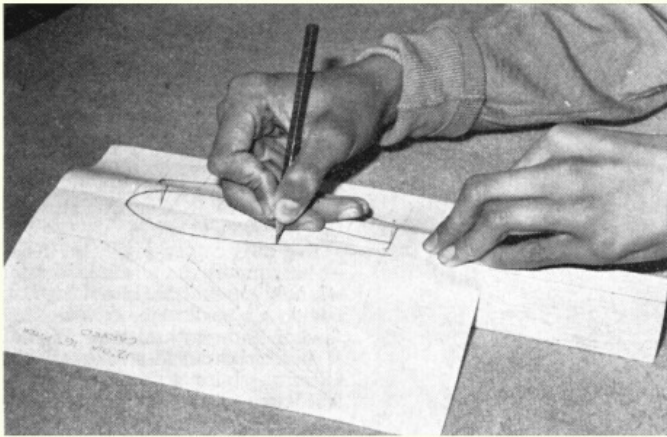
Although the original Mills engines were generally considered to be of high quality, it is a fact that they varied quite a bit in regard to the dimensions of individual parts. The bore and stroke measurements, for example, were often appreciably different from the maker's nominal .330 x .520 in., as were port timings and, although one rarely found an engine that did not start easily and run well, power outputs could vary enormously. On one occasion we tested three P.75's and the most powerful turned out to have a 57 per cent higher maximum output than the worst of the three. It remains to be seen whether the Indian version will be more consistent, but initial impressions appear to be favourable with good handling and a performance well up to average.

Super Tigre ST.35 Stunt

We have just been having a look at the latest version of the Super Tigre ST.35 control-line

Parts of the latest model of the well-established Super Tigre 35 control-line stunt motor. Design follows mainly orthodox stunt 35 practice.





AIRSCREWS EN MASSE

by Ron Coleman

Part 4: Carved from block

Transferring the calculated profile shapes (from Figure 1) on to the block of balsa using a pencil and carbon paper. Make sure that the second blade lines up correctly with the first.

PERHAPS the title for this series is something of a misnomer when considering the carved variety of model aircrew, but it is hoped that the reader will find something here to speed his production, or at least, to make the job easier, more accurate and more satisfactory in every way. There are some models for which the carved aircrew is best suited - none more so than the flying scale model. As for experimental and unorthodox models, well often balsa aircrews just *have* to be carved. Also, there is something very satisfying about carving an item from a solid, unimaginative 'lump' of wood!

Our example in this case concerns a propeller with a 12 in. diameter and with 16 in. of pitch. Firstly, mark out the design drawing as shown in Figure 1, referring also to the previous articles in this series. Mark off the 1 in. stations along the base line BC and complete the pitch angles to each station. Draw the plan view of the blade blank on line DE, 1½ in. below, and parallel to, BC.

Continue the projection lines vertically down to cut another line FG, which represents the centre line of the side view of the aircrew blade. Now by taking the blade blank width as each station (e.g. bb in Figure 1) from the plan view, and laying them along

BC we arrive at the points to erect the perpendiculars (e.g. points cc in Figure 1). Thus we obtain the thickness for the blank at each station.

We can now complete the blade side view by equally balancing the thickness measurements about the centre line FG. The smooth curves of the side view may be drawn through the ends of the perpendiculars at all stations. Towards the hub the true pitch angle has to be departed from in order to keep the hub to a reasonable width. To achieve this the back of the aircrew is generally cut away and sometimes also the front. If when drawing the plan view of the blades it is remembered to keep the shape nice and slim towards the hub, the more conveniently will the side view work out, there being less need to depart from the true lengths of perpendicular (indicated by position x x).

The drawings may now be transferred to a suitable block of balsa wood. Try to choose a piece with annual rings lying parallel to the face, and not diagonal, as illustrated in Figure 2. Use soft carbon paper to trace the shapes onto the wood. It is best to draw a centre line down the length of the block first and locate the hub centre with a pin passed through the drawing. Put a pin at the tip also. Now,

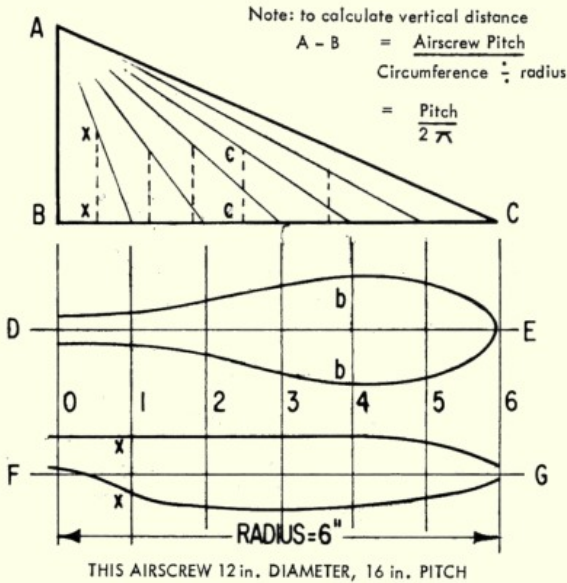
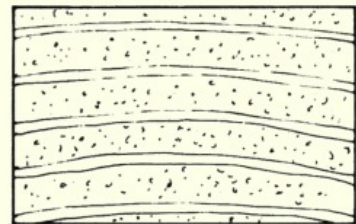


FIGURE 1
Calculating
blade shape



Choose a balsa block with annual rings which lie parallel to the face for even carving and equal balancing.

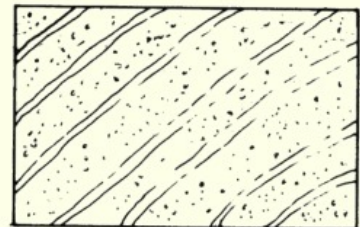


FIGURE 2
Wood
selection

Diagonal annual rings make for difficult balancing.

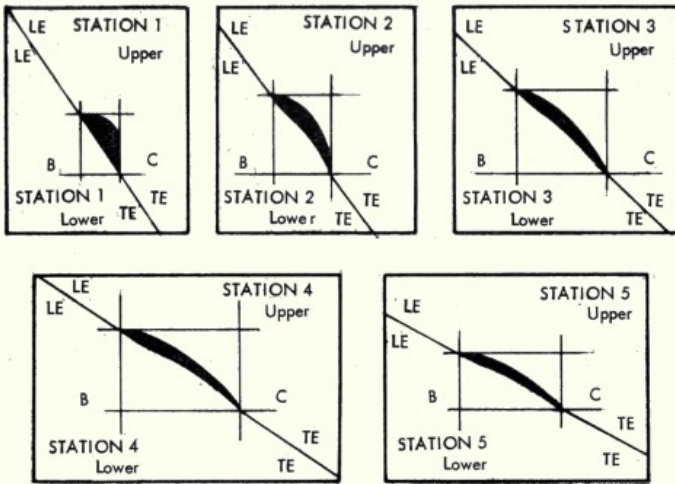


FIGURE 3 - Section templates

when one blade is traced through, the drawing may be pivoted around on the centre pin, lined up on the centre line once more, and the second blade traced through. Perhaps an even better method is to make accurate templates from thin plastic cut from used washing-up liquid bottles (useful things these bottles!). If the centre-lines, stations and other information is marked on them the templates can be used many times for reproducing the same airscrew.

Card Section Templates

A more accurate job can be made of the carving process by the use of card templates as a check at each station along the blades. This entails quite considerable extra draughtsmanship of a fairly high standard - the pencil must be hard and sharp and measurements taken with spring-bow dividers from a fine scale. Airfoil sections for airscrews are generally much thinner than those used for wings, and while to draw an accurate airfoil from a table of co-ordinates is reasonable enough for the greatest width of the blade, towards the tips and hub the upper and lower surface measurements become very fine indeed!

Figure 3 shows a typical set of five card templates for the 12 in. airscrew which we are discussing. The cards are cut through at the pitch angle, making two halves. If the line BC is first drawn upon a card the rectangle of the airscrew blank can be added from

At right, the prepared blank of balsa with the blade profiles marked on its faces prior to carving - to be described in the next issue.

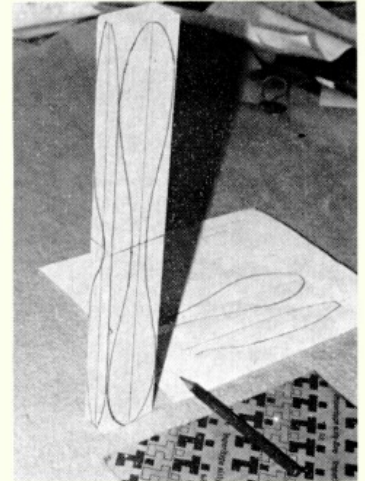


Figure 1, and then the blade angle from corner to corner, upon which is drawn the airfoil section of the particular station. The shape is cut out and the card divided so as to fit one half above and one half below the blade. Use a sharp pointed craft blade for cutting out the shapes, which should be drawn on any thin card - postcards are ideal.

Towards the hub the section will change from an undercambered one to first a flat undersurface, then convex, then the section fattens up into an oval, until it 'disappears' into the hub centre.

Draw the largest airfoil first, using the co-ordinates as shown below, then draw as many as possible of the remaining ones from the co-ordinates and from the smallest of these the sections towards the tip and hub can be developed. Draw them on tracing paper, then one section may be laid over the other and 'seen through' to check the gradual change of section. Bear in mind the maximum thickness - the thickness/chord ratio is quite large at the hub, depending upon the strength required. Perhaps it is best to think of the maximum blade thickness as being the main tapered spar of the 'wing'.

Having drawn the sections, transferred them to card templates marked (each half) with the station number and LE and TE for quick reference, we are now ready to consider carving the airscrew.

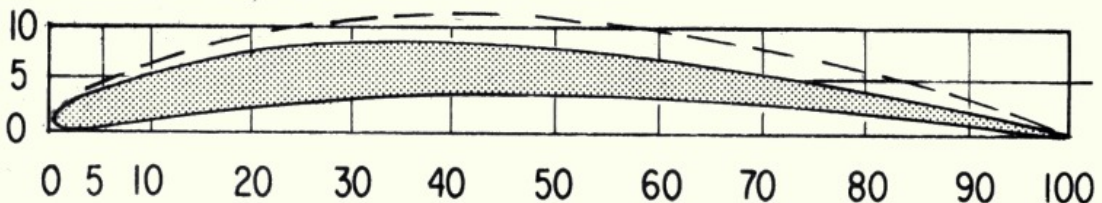
Next month - Carving the airscrew

AIRFOIL CO-ORDINATES

Other sections may be suitable; sometimes considerably modified, as indicated by broken line, for greater strength and ease of carving

	0	5	10	20	30	40	50	60	70	80	90	100
UPPER	0.7	4.0	5.4	7.4	7.8	7.7	7.5	6.5	5.2	4.0	2.2	0.0
LOWER	0.7	0.0	0.7	2.5	3.7	4.0	3.9	3.8	2.6	1.9	.9	0.0

FROM LEADING EDGE, PER CENT OF CHORD.



FLY SPEED



and join an ever-increasing bunch of enthusiasts, invites

MARTIN RADCLIFFE

WHEN BUILDING a speed model there are five basic points which must be met for the model to fly in a satisfactory manner and the newcomer to speed should concentrate on building and flying a model built to these standards, with an ordinary, cheap (well, relatively anyway!) engine long before he even contemplates the purchase of an expensive, hot, tuned-up mill: all too often I have seen newcomers appear at competitions with motors much faster than I have ever possessed, installed in models that have never been flown before. The only records broken by these models is the one for the fastest wing-over on earth . . . unfortunately this is not recognised by the S.M.A.E.! These all-important points are:

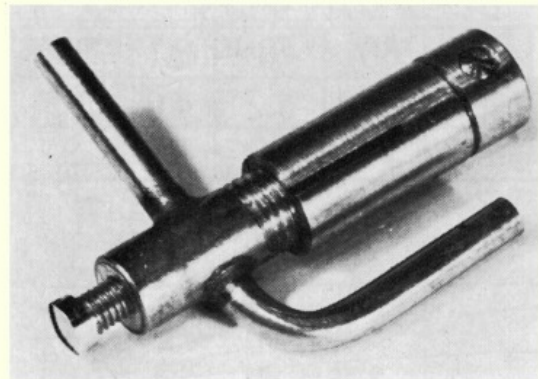
1. **Rigidity:** This really concerns the structure of the model and the essence of it is that everything *must* be rigid. The wings and tailplane must be made from a material that will not twist in any direction, and they should be carved *without the slightest hint of a warp*. Some model plans indicate that a twist should be carved into the wing (the A.P.S. *Ginmill* which flies clockwise, uses a wing warp to counter the effects of engine torque) but this is rather a 'hit or miss' affair and the results are not worth the work involved in accurately carving a twist.

The engine should be securely bolted into a *metal* pan which has walls sufficiently thick to withstand a hard, power-on, landing (the American Harter pans are ideal, though a little expensive). The face of the pan should be perfectly flat so that the engine's crankcase is not distorted as it is screwed down while the pan itself should be bolted *firmly* to the model, and the hold down bolts themselves should run

This geared Uni-line handle, for use with mono-line control, is made by Emil Rumpel, available through Irvine Engines. This type of handle permits nearly 'normal' C/L operation, i.e. up is 'up', down 'down', although movements are greatly exaggerated.



If you must use a tuned pipe on your first speed model (not recommended due to the many additional problems to be encountered) then some form of fuel switch is necessary to obtain the very rich inflight needle setting. This Miebach centrifugal-force operated switch is one solution.



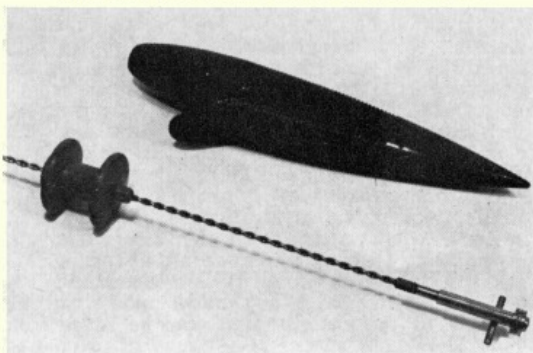
through metal tubes in the model.

2. **Centre of Gravity:** The C.G. should be located between 5 per cent and 17½ per cent of the wing chord, measured from the leading edge. If it is any further forward than this then the model will be unresponsive and you will have difficulty in pulling it out of a dive, and if any further back, then the model will be impossible to control and will 'hunt' up and down. This is especially important to avoid with monoline operation, where control is minimal at the best of times. The line should emit from the wing tip on or near the C.G. If the line is too far behind the C.G. then the pull will be excessive. As a general rule, if the line is in front of the C.G. the model may travel faster, however, if the line is too far forward the model tends to fly into the circle on the first lap when the airspeed is low. For two-line models, a point midway between where the two lines emit at the wing tip should correspond with the wing tip emission point of a monoline wire.

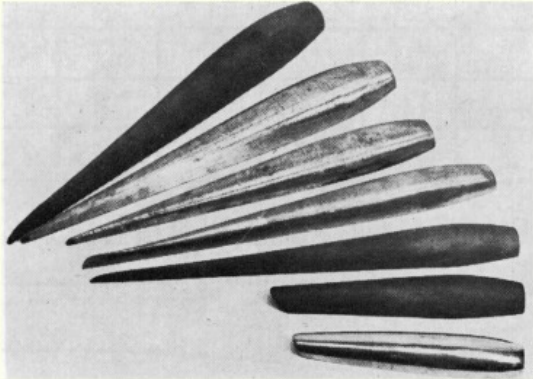
One hint here, is that to get the C.G. in the right position without recourse to ballasting, I build the model without the wing in position. When everything is complete and the model ready for the finish to be applied, the balsa fuselage top is removed above the crutch and the model roughly assembled with motor, tank and wing in position such that the C.G. is ¼ in. in front of where it is desired. (The C.G. moves back approx. ½ in. when the finish is applied.) The wing position is then marked and the model assembled permanently ready for the final finish.

3. **Incidence:** The use of wing incidence is something of a controversial point. Incidence is unnecessary on most C/L

The Stanzel mono-line handle works on the Archimedean screw principle. The 'cross piece' (bottom right) is retained in the handle, then pushing the button along the spiral twists the control wire, which in turn operates the torque unit within the model. Control is thus 'push-pull'.



Engine pans are essential for speed models, and there are a variety of shapes and sizes available, albeit not from your local model shop. Irvine Engines, however, can supply many different types, and, in fact, stock most of the specialist speed 'goodies' mentioned in these pages.



models as the pilot unconsciously puts on a little up elevator to hold the model's nose up. On a speed model a 'little up elevator' just gets blown flat at 150 m.p.h. plus! So, on my models, I set the wing with a little positive incidence ($3/32$ in. under the L.E. on a 5 in. chord wing) and the tailplane is set at zero incidence. I have often been told that if my wings had lifting sections I wouldn't need incidence - just try telling that to a free-flight flier! Anyway, joking aside, a little positive incidence certainly helps monoline models pull out of those screaming dives to which they are so fatally prone.

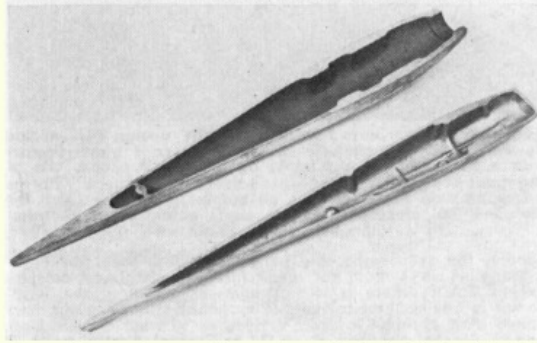
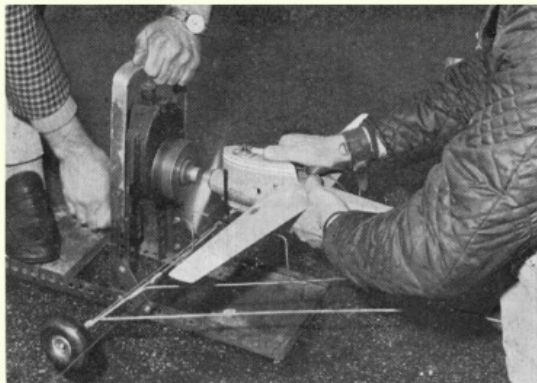
4. **Fuel Tank:** Probably almost half the speed models one sees at the average British Speed meeting suffer from poor engine runs. There seems to be little I can say to improve matters, except perhaps that a model should *never* be released on a lean setting. Pen bladder tanks are easy to make and you soon find out if one develops a leak! However if you want to stop the motor in a hurry the needle has to be fiddled around with, and also the motor has to be set very rich on the ground to give the correct 'in air' settings, when used with most modern motors, which pick up several thousand r.p.m. in the air. A metal (sometimes called 'hard') pressure (or suction) tank does not suffer too badly from this last point, and if you want to stop the motor in a hurry (during a shaft run for instance) one just tips the model onto its inboard tip. However metal tanks are prone to gradually leaning out during the run, and a hefty landing can easily split a seam in the tank which might go unnoticed with disastrous (lean in the air) results.

5. **A good dolly** (you can read this paragraph two ways!!). Having installed your expensive racing motor in a nice, well built, model the least you can do is ensure that it leaves the ground safely. There are numerous types of dolly (rat-trap, plug-in, drop-in, etc.). The most important constructional point which is common to all the various types is a loop of wire which comes out of the front to support the nose of the model, thus preventing the model from tilting forward and losing the prop blades in the resulting cart-wheel. My present favourite is the drop-in (as sketched), the advantage of this type being that the motor may be started free of the dolly and then the model placed in the dolly for take off (watch the prop blades!) when the pilot is happy with the settings. Also, there is no danger of the model jamming in the dolly and carrying it into the air where it might fall off and hit someone. The dolly should be built of 8 or 10 s.w.g. wire and must be rigid to prevent the model from bouncing up and down during the take-off run. The dolly should be checked for straight tracking before each flight in case it has become twisted, as it could turn-in on take-off and launch the model at the pilot. Not recommended! One important point of my various dollies which has nothing to do with flying the model (it has been called the greatest break-through in dolly design!) is that they are built for various sizes of models, and may be stacked one inside the other for ease of transport - it's amazing how much car-space four dollies take up. It is also a good idea to paint the dolly a bright colour, so that it may be easily found again after the flight.

Those are my five cardinal rules for a successful speed model, the rest is just a matter of commonsense or personal preference. Talking of commonsense, the control system must of course be totally free (tilt the model up on its outboard tip to see if centrifugal force is going to make everything bind up), and should bounce up and down when the elevator is given a light tap with your finger (metal tube and wire hinges are almost imperative in my view).

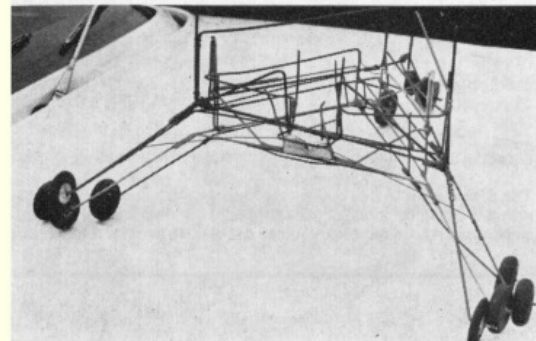
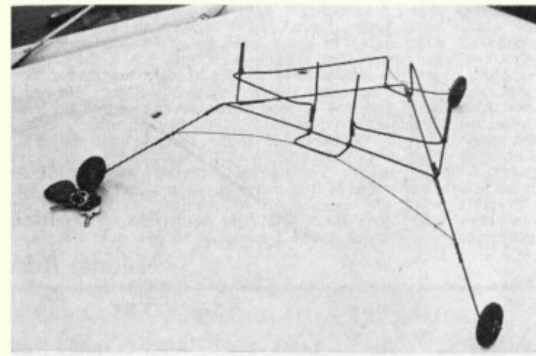
The wing and tail sections on my models are symmetrical (non-lifting) with the maximum thickness at 40 per cent of the chord, the trailing edge is quite sharp and the leading edge comparatively blunt. I don't really suppose the section makes any real difference to the air-speed, so use any section you like although Clark - Y might be taking things a bit far! Similarly, a lot of rubbish is often vented when it comes to aerodynamics and speed models, and a sure way of starting an argument is to talk about the merits of the *Stuppi* or *Pink Lady* designs! Both models are complete opposites in every way, yet are equally as fast as each other, when everything is taken into account. I used to be of the opinion that it didn't really matter if the model was on the heavy side, then I built a 44 oz. '60' model and it nearly dislocated my arm at a mere 150 m.p.h.! The moral of this is, if you don't want a hernia, don't build 'em heavier than 38 oz. The only limiting factor would seem to be how much the human frame can handle (F.A.I. speed models have a wing-loading upper limit). The heavier models (i.e. approaching 38 oz.) should only be flown with a speed pylon to hang on to.

Your first flight using a pylon should NEVER be made with a speed model - use an old combat model or team racer as their motors are much cheaper! When placing your hand in the pylon NEVER take your eyes off the model, the F.A.I. two-line handle with the cross piece is very, very difficult to use, and I have found that with these handles it helps if you set the pylon at chin height, so that you can see the



You will need some form of mechanical starter for your speed engine (see top), small diameter, high pitch props are not very practical for hand starting. Many people still employ starters based on grindstones, etc., but modern electric starters are perfectly acceptable and perhaps more convenient. Above are shown a pan for a 10 c.c. engine, and one for a 2.5 c.c. engine. Note the 'hefty' construction of the former, the 'cast in' ribs on the latter.

Below, a typical take-off dolly, as illustrated on page 500. Below that is what Martin would describe as his best idea yet - a set of well-stacked dollies. At least, we think that's what he means.





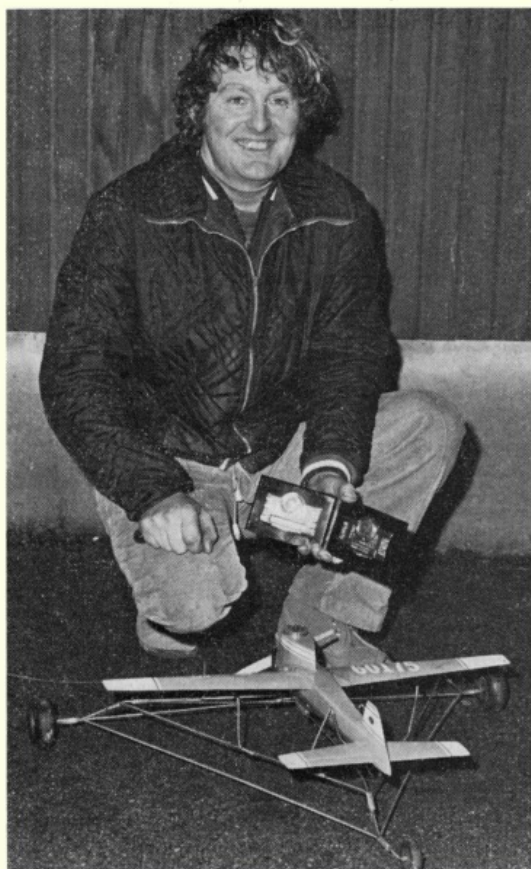
Above: the author with his 'White Fright' design (drawn and detailed right) which held the British record until recently with a speed of 173 m.p.h. At right, Brian Jackson, one of the most successful British speed flyers is seen here with the prizes he won at an Elliott Club meeting, where he won the '29' and '40' classes using the same model but with interchangeable pans/engines.

handle, the pylon yoke, and the model, all at the same time.

Monoline is a must for really fast speeds in all classes except F.A.I. where it is not allowed, although the newcomer is advised not to build a monoline model as his first speed ship. Opinion is again divided as to what is best: Uniline or Stanzel handles; H. & R. or Stanzel control units. I prefer the Stanzel twisted-wire handle mainly for the reason that it is easier to apply control on one of these handles in a pylon: it is no joke trying to raise and lower one's arm with a Uniline handle when the model is pulling hard. On the other hand it is not easy to learn to fly with a Stanzel handle. My only reason for using H. & R. control units is that they are readily available.

Another controversial point is the amount of wing area that the model should have. The world 10 c.c. speed record is held (at 196 m.p.h.) by a Russian model that can only be described as enormous, but the Americans on the other hand are turning speeds of over 200 m.p.h. (with 10.8 c.c. motors) using very small area models. One cannot lay down any set rule about wing areas, but I have drawn up a table with suggested wing sizes in it. A large tailplane area generally helps the stability of the model, although if the C.G. is in the right place the model should be stable in any case.

As can be seen from the *White Fright* drawing, I am not a great believer in the use of low nitromethane fuels! My only reason for this is that while nitro is so comparatively cheap and easy to get these days, there seems little point in diluting it down with methanol which does not give as much power. A lot of people disagree with my use of Ucon LB625 oil as a lubricant, but it has never given me any trouble and it doesn't leave any carbon in the motor, also other oils won't mix with more than 40-50 per cent nitro. When I first fly a motor in a model, I use a brew of 15 per cent nitro and



25 per cent oil. This is in case the motor is still a little 'tight' and overheats. If the brew is too 'hot' at this stage then a steel piston may be turned blue (annealed), or if the motor is of the ABC type you stand a chance of burning a hole in the piston crown! If everything is O.K. the nitro content can steadily be built up to 60 per cent over several runs, and if all is still O.K. then the motor and yourself can be considered ready for a competition. The 'Piston Flattener' fuel mentioned on the plan should not be used until the motor is well and truly run-in. I have often heard the complaint that an increase in nitro does not give an increase in speed, this is usually because the motor has too high a compression ratio, so it is sometimes necessary to put in an extra head gasket or two as the nitro level is increased. If the motor four strokes and then cuts out as the needle is screwed in, then it is probably under-compressed.

Model Recommendations

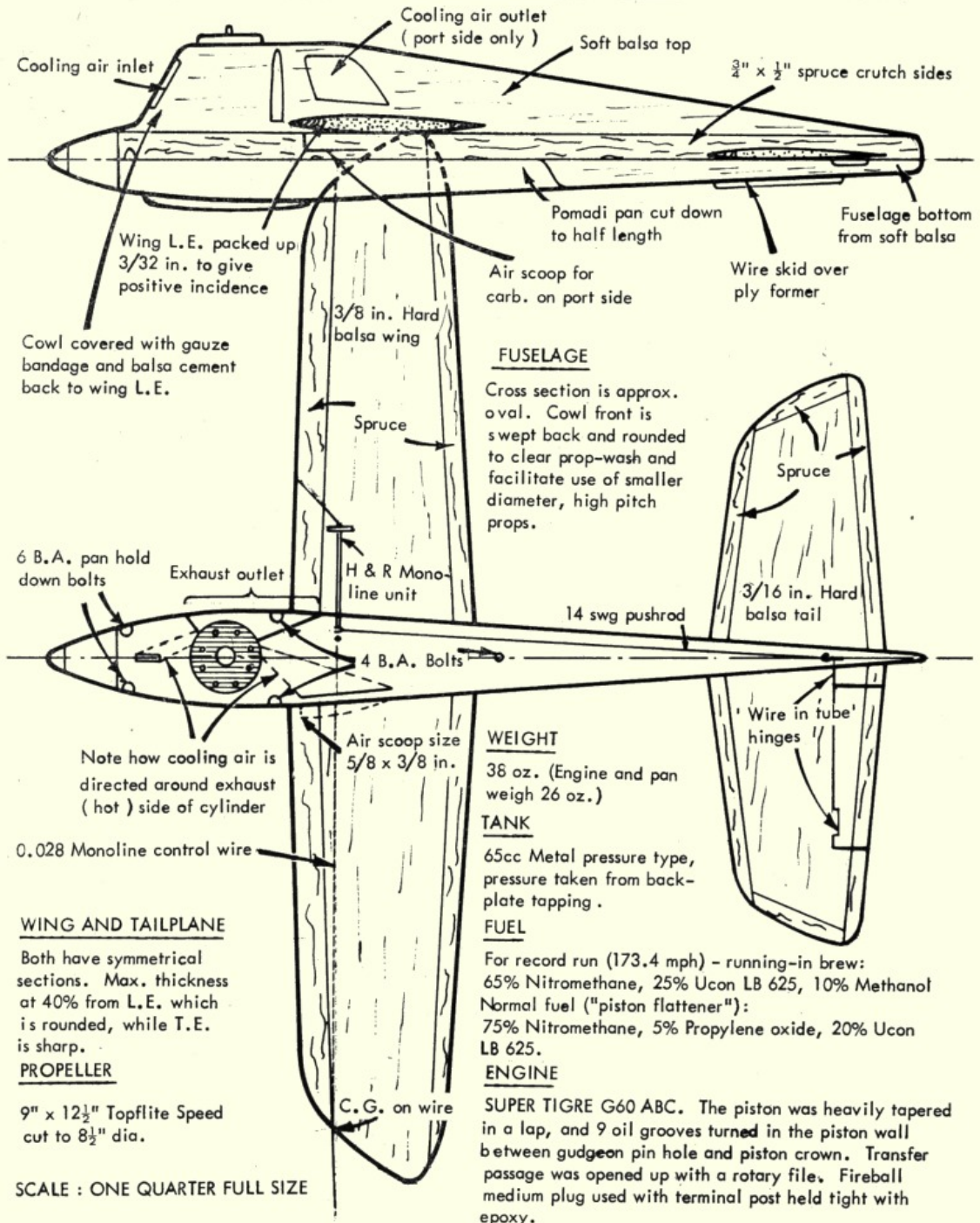
Engine Size	WING			TAILPLANE			Tank Size	2-Line Wire Thickness	Monoline Wire Thickness	Suggested Propeller	Suggested Motor
	Span	Av. chord	Thick-ness	Span	Av chord	Thick-ness					
10cc	27"	3"	$\frac{3}{8}$ "	12"	$2\frac{1}{2}$ "	$\frac{1}{2}$ "	60cc	28 Swg	22 Swg	*8 $\frac{1}{2}$ " x 12 $\frac{1}{2}$ " Top-Flite	S.T. 60 ABC, OPS 60
5-6.5cc	24"	$2\frac{1}{2}$ "	5/16"	10"	2"	3/16"	35cc	28 Swg	24 Swg	*6 $\frac{1}{2}$ " x 9" Punctilio	S.T. 29/HP.40
2 $\frac{1}{2}$ cc (open)	20"	2"	$\frac{1}{4}$ "	8"	1 $\frac{1}{2}$ "	5/32"	25cc	30 Swg	26 Swg	*5 $\frac{1}{2}$ " x 8" Rossi	Rossi 15 (Unpiped)
1 $\frac{1}{2}$ cc	12"	1 $\frac{3}{8}$ "	3/16"	6"	1 $\frac{1}{2}$ "	$\frac{1}{8}$ "	17 $\frac{1}{2}$ cc	33 Swg	28Swg	15" x 6" Punctilio	Cox 09
0.8cc	10"	1 $\frac{1}{2}$ "	5/32"	5 $\frac{1}{2}$ "	1 $\frac{1}{2}$ "	$\frac{1}{8}$ "	12 $\frac{1}{2}$ cc	36 Swg	30 Swg	14 $\frac{1}{2}$ " x 5" Punctilio	Cox 049/051

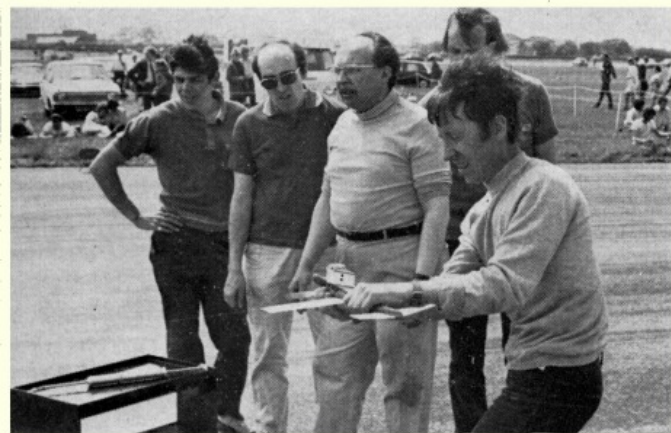
The S.M.A.E. Rule Book suggests Monoline thicknesses which are rather too thin for a reasonable degree of control: Test fly on the above thickness and, if you think you can make it, then try a thinner wire.

* Cut down from $\frac{1}{2}$ " larger diameter.

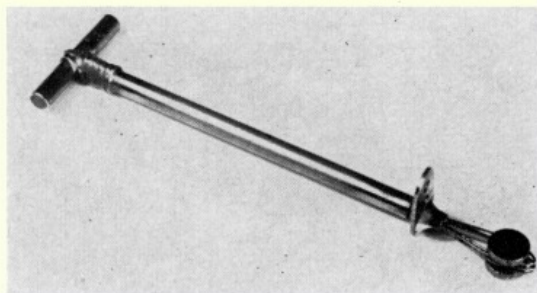
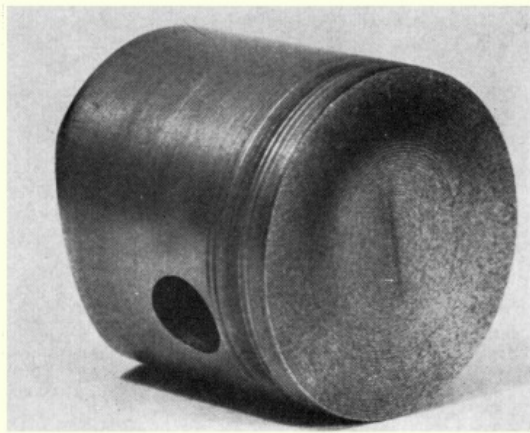
† If unavailable in this size carve down from larger size.

WHITE FRIGHT





Above: Heave! Safety is important when flying speed, especially with the '60' class. Here Mike Billington, current British record holder (180 m.p.h.) takes the strain of a line check with his all metal Super Tigre 60 powered model. Above right: Martin calls his 'hot' fuel 'piston-flattener' and that's why! After one flight, note how the crown is 'creased' and has developed a hairline crack. The oil-retaining grooves cut in the piston wall above the gudgeon pin may clearly be seen. At right the H. & R. Torque unit, the 'bellcrank substitute' on the mono-line model. Make sure it is retained securely. . . .



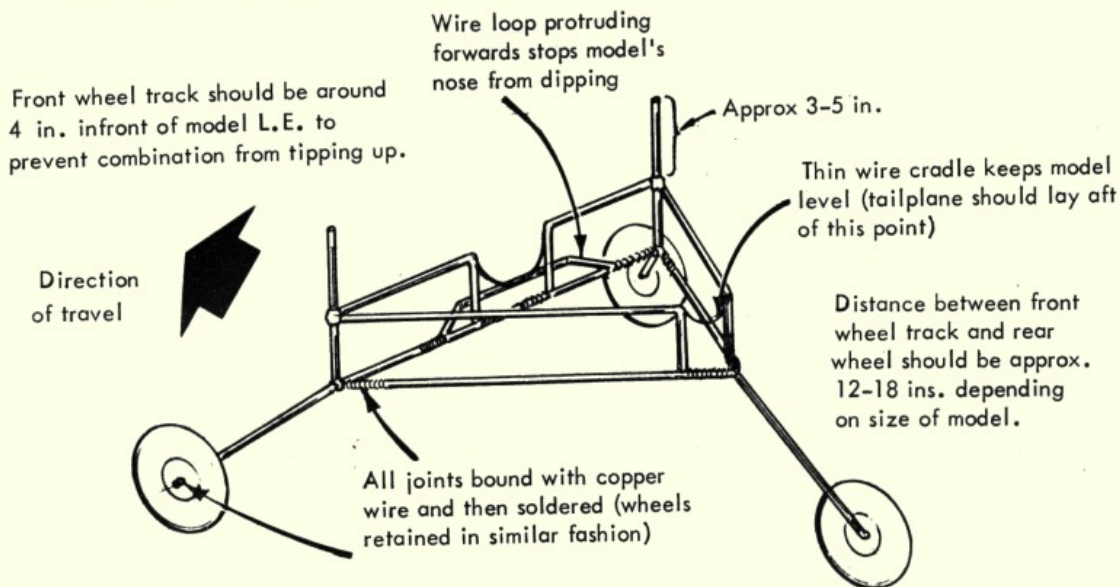
A shortage of suitable propellers used to be a bit of a problem for the speed flier, but this state of affairs has been alleviated with the introduction of the Punctilio range. It helps if you can check the pitch of a propeller on a pitch gauge before using a prop, as the manufacturers are quite capable of making a mistake, which could cause a poor run. One manufacturer's 9 x 12½'s seem to always be 9 x 11 when measured on a gauge, and when Mike Billington remeasured his 8½ x 10 after setting his 176 m.p.h. record he found one blade to be 9 in. pitch and the other 11 in. This was thought to be due to the prop distorting as the nut was tightened, since it had been accurate before the flight. Needless to say all props should be checked for balance before use.

There is little I can say about engine modification that has not already been said by George Aldrich in his 1967 *Aeromodeller Annual* article, anyway the newcomer is advised to steer clear of engine mods until he can put in a good clean flight with a standard mill. One thing worth checking is that the plug gasket is of the correct thickness for the plug bottom to be flush with the inside contours of the head. I use Fireball medium plugs, though not for any special reason. Hot plugs should be avoided as one cannot risk a lean run that could mess up the piston and liner assembly. If, however, the engine starts four stroking, or even stops when the starting battery is disconnected, then the plug is too cold. It is worth reinforcing the insulating seal with epoxy, as if

the seal does blow then the run can be pretty poor, and the engine might be damaged, with pieces of broken seal and plug 'cement'.

I have not mentioned tuned pipes, as this article is aimed at the newcomer to speed, who will find that he has got his work cut out to put in a flight with an ordinary un-piped motor. I would advise the newcomer to start in the 5 c.c. class: smaller classes are a little 'fiddly', the 10 c.c. class rather 'hairy', the open 2.5 c.c. class is rather expensive (over £30 for an un-piped Rossi 15) and the F.A.I. class extremely competitive. The Super Tigre 29 can be bought for less than £20 and should make over 150 m.p.h. on two lines, which is usually good enough to get near the top three at most British Speed Comps.

I hope that the foregoing has not put too many of you off! Speed fliers are not the insular crowd that many believe us to be, and we are quite willing to help the keen newcomer when he turns up at a meeting with his model, so let's be seeing you!!



"DROP - IN" DOLLY 3-VIEW

Make better use of

GLASS REINFORCED PLASTICS

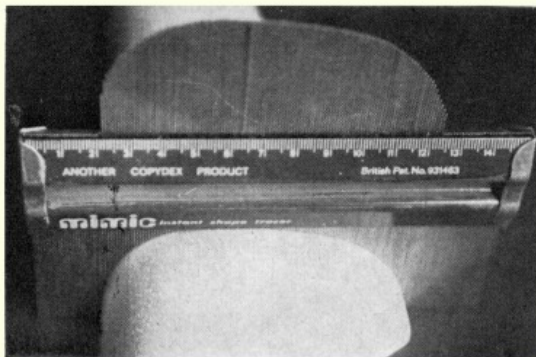
urges Trevor Faulkner

THERE IS some considerable evidence to suggest that units moulded in glass-fibre are finding greater favour in certain branches of aeromodelling at the expense of the previously more popular vacuum-formed materials. Many modellers have used polyester resins with glass cloths or mat as a standard method of reinforcement, usually applying it in the form of a skin to a softer and more easily shaped core, e.g. balsa. This layer would then be finished on its outer surface, producing a 'one-off' job. More recently, the adoption of glass-fibre rods for A/2, A/1, chuck glider and power model booms has demonstrated the ideal qualities of the material in the context with which we are concerned. In addition, the use of this substance on a commercial basis, particularly when applied to some of the larger prefabricated models, indicates that predictable results are to be had without prohibitive labour costs. This should encourage the do-it-yourself modeller with a liking for more than 'stick together' building.

The great advantage of most moulding processes is the relative ease with which almost identical units may be made, the *disadvantage* being in the amount of preparatory work prior to producing the first unit. . . . exactly the same as for a small production run. The break-even point varies of course, but there is little doubt that the more units to be made, the greater the saving in time and unit cost.

What is the use in modelling of the 'limited production' as against the 'one-off' approach? Actually, all we need are a few chaps with the same interest in either a model or a component—it is not unknown for individuals to market parts for a popular model design which is not kitted, and which others have neither the time nor inclination to produce. Teams sometimes produce a number of almost identical models, and a Club may be the ideal starting point for such a joint venture. Even in the case of the indi-

Using the Copydex 'Mimic' to check on the profile of the wooden blank. A useful gadget, which has many D.I.Y. applications.



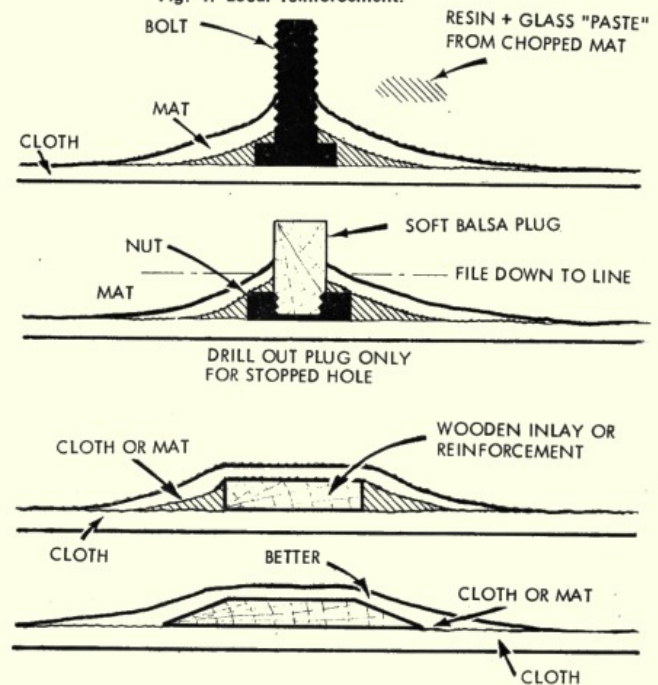
vidual modeller, there may be a strong reason for a modular unit to be made; some of us like to progress through a series of variations on a successful theme. In fact, the competition scene on the whole has plentiful examples of this, and so long as certain variables can be accommodated, a basic unit may save a great deal of building time. The finer details of course need to be resolved according to individual or group needs, but the principle remains the same.

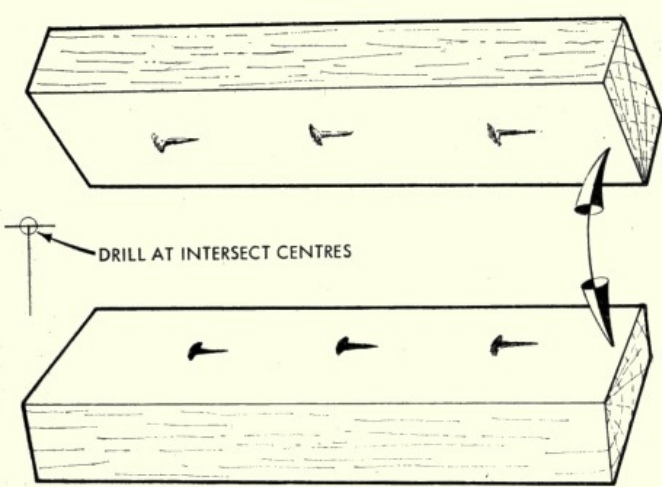
Nature of the Material

Glass reinforced plastic, as the material should be termed, is particularly suited to areas of extreme curvature, and is a natural for smooth, streamlined shapes. Of course, block balsa is traditionally associated with compound curves, but has to be either quite substantial to avoid short-grain sections or strengthened by some other substance in combination. The way in which laminates follow the form in a moulded unit give ideal strength characteristics—the technique of conventional balsa planking has these advantages but double curves are very difficult to cope with successfully.

The ease with which local strengthening may be incorporated into the structure compares favourably with any plastic used for vacuum forming, indeed the variations of thickness to be found in some commercial jobs is unfortunate—thin areas often occurring where a little more 'beef' would be welcome. In addition, many other materials may be amalgamated with a laid-up form, (wood, metal, wiring) along with fittings (studs, bolts, nuts), in such a manner that the

Fig. 1: Local reinforcement.





TACKS HAMMERED INTO LOWER BLOCK. UPPER BLOCK PRESSED INTO REGISTER AND HIT ONCE. IMPRESSION ON TOP BLOCK RESULTS

Fig. 2: Aligning the blank halves.

dispersal of local stress-points happens almost as a natural by-product of the technique (see figure 1).

Let us now deal with a practical problem, and a possible solution in order to demonstrate some of the above points.

Object

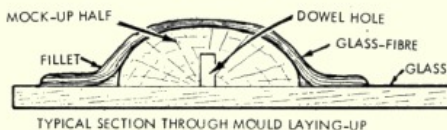
The pod for a simple, large glider with the following criteria:

- 1) To accept up to 9 in. chord wing.
- 2) Joint area to accept a rolled ply fuselage boom
- 3) Reinforced cockpit and wing-seat openings
- 4) Accommodation for certain equipment, scale details, etc.
- 5) Double curvature shapes.
- 6) Self-coloured
- 7) Optional placing of cross-braces or formers
- 8) Easy production of duplicates

The size of the unit is affected by items 1, 2, 4 and 5 plus consideration of the overall shape and including the nose moment in terms of chord widths. The transitional section from the wing trailing edge to boom joint is less critical and depends upon appearance as much as anything else. It must be remembered that the shell will have a dimension of some 1/16 in. or so, and therefore, this allowance must be made when designing the enveloping structure. A plan and evaluation drawing of 'contents' may help at this stage, although the writer tends to make use of a sketch diagram with dimensioned salient features. If equipment varies amongst a group, then obviously the units with the greatest volume must form the dimensional criteria. Eventually an outline plan, elevation and some crucial minimum sections will have to be drawn up. Do not neglect the drafting of these 'sections through' as the curved shapes we are likely to employ do not hold box-like corners of servos, timers, etc. snugly, and the *shape* required rather than an equivalent *volume* is what matters. However, as drafting double curvature forms is not easy and can be very

At right, the finished mock-up. Note the built-up walls for canopy location, etc.

Fig. 3: Producing the glass-fibre mould.

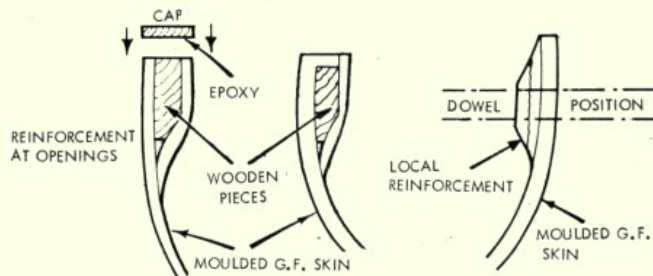


time consuming, be assured that a prudent bit of planning regarding the crucial sections will allow you to get on with the interesting and more creative bit. . . . that of designing a satisfactory 3-D mock-up. The following method of achieving this is suggested because it works well without the necessity for one being a pattern-maker by trade! The pattern consists of two equal but opposite halves divided in the vertical plane. These halves are worked and used separately most of the time, but at certain points in procedure need to be brought together in accurate register. The main sequence is as follows:

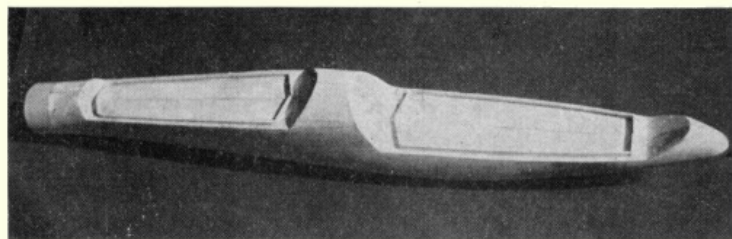
Select two pieces of suitable straight-grained soft-wood such as deal, obeechee, jelutong, etc. (I know obeechee and jelutong are hardwoods, but 'soft' ones!), then face-up two perfectly flat joint faces. A large sander is the ideal tool, but a number of methods will also serve. Now drill matching stopped holes in both halves using the 'tin tack' method of marking out. (see figure 2).

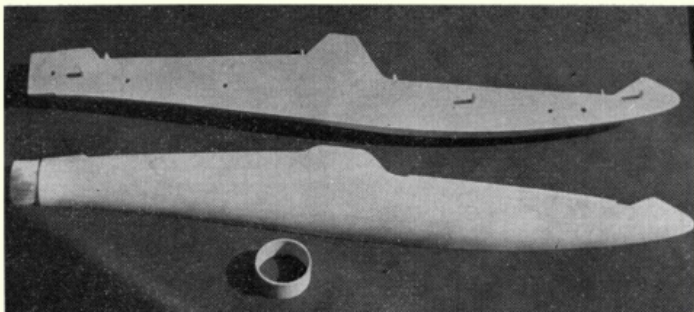
Transfer the profile (one reversed, remember) to the faced surfaces, and cut round allowing a slight margin of 3/32 in. or so for finishing, with a coping or bow saw. Sketch in the plan profile (again a right hand and left hand version) and remove this waste.

Figs. 5 and 6: Reinforced areas.



Next, mark in the areas of the form represented by your main sections as lines on the inner faces of both halves (bleed these to the outer surface for reference) and carve both halves to a rough finish. Frequently check that the blanks are being carved symmetrically, and hold the pieces together to ensure that the shape is progressing satisfactorily when viewed from any angle. (If you really want to see how professionals can slip up in this, squint along the side panels of certain cars so as to see the sections revealing themselves as you change position. . . . the bad vehicles often look quite good in profile and front view, too, but the meanderings of their highlights are atrocious!). Draw in more check points across the joint faces, and frequently refer one half to another by making templates which fit both. (The 'Mimic' template illustrated is an ideal tool for the job and can justifiably be bought by the householder as a boon in lino-laying time!). Carve the boom joint area very carefully, and if applicable, get an exact replica of the finished shape to fit to a





The blank halves separated ready for production of the glass-fibre mould. The ring in the foreground is made from ply, and is the same diameter as the rolled ply boom to be used as the rear fuselage portion - a technique which will be dealt with in a future issue. Using this 'ring' as a former enables carving the blanks to the exact shape required for a smooth, blended-in appearance.

typical thickness of the adjoining component. Sand the assembled unit to a good finish, then mark out any areas to be removed for wing seats, canopies, etc. Cut out these areas after separating the halves; this allows a slightly raked surface to be given (see figure 6), which will facilitate mould withdrawal. Always cut on the waste side of the lines involved, paring back carefully to exact size (keep the canopy section for use in moulding a cover if required). Finish all outside surfaces with any technique or system you prefer until they are smooth and polished: Brasso gives a splendid finish.

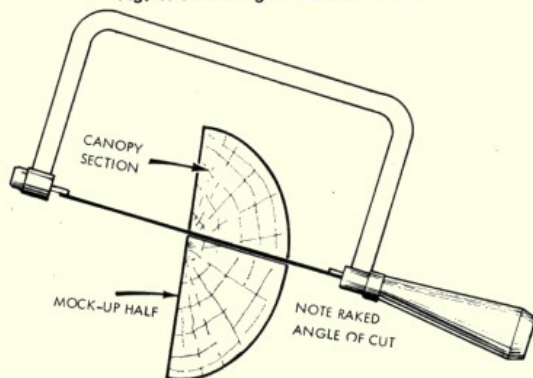
Build up 'walls' from hard balsa or spruce strip on any surfaces where a cut-out will occur (this avoids subsequent fretting out and gives access for later jointing) and dope these walls thoroughly. It is much easier, to add these parts after overall polishing is completed and the wall surface does not register on the finished product. Select a smooth flat surface, (glass, metal, formica etc.) and lay both halves face down on this plane, then proceed to make the glassfibre moulds from these blanks, following the standard technique for a G.R.P. lay-up. . . . separator, gel coat, mat, resin, mat etc. in sequence. (Details of this procedure are quite well known or are supplied by the manufacturer so they will be assumed to be familiar). See the diagrams for details pertinent to this job. Aim at a wall thickness of about 3/32 in. and a mould thickness of 1/16 in. or so, allowing generous fillets to occur at changes of section for strength. After the resin has cured, remove mock-up halves and appropriate half-moulds from the sheet surface. Fit dowels and assemble, checking for a good mould-seam overall. As the mould halves will eventually need to be bolted together the relevant holes are now drilled in the mould walls to be a slight clearance fit on the bolts to be used: 1/4 in. diameter is a useful size. The moulds may now be removed from the former, cleaned and the lay-up of your first unit begun. Finally trim edges of both laid-up halves when 'green-cured', bolt mould together and manipulate joining strips of cloth with resin across interior seam.

In conclusion, let me add a number of notes stemming from personal trial and error which may avoid others wasting time:

1. Glass cloth is much stronger, weight for weight, than mat; use it for the finished components.

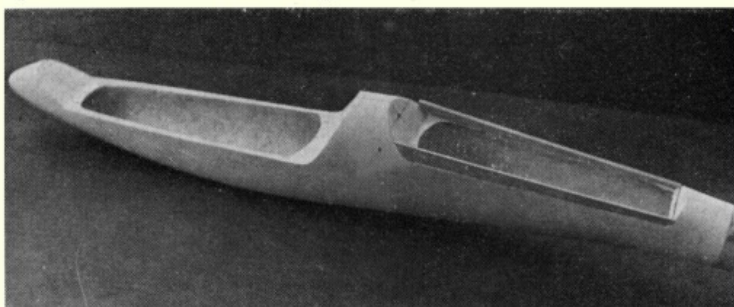
2. Coloured resin in the lay-up is nice and avoids a subsequent paint job. Pigments are readily available from suppliers.
3. A thixotropic resin in the gel coats allows easier control of lay-up thickness.
4. Plan areas for reinforcement well in advance and build them up during lay-up procedure. (Figure 4).
5. Spend plenty of time getting everything ready before mixing resins. Make patterns for the layers of cloth which will ensure accurate and even distribution of this material.

Fig. 6: Removing areas from blank.

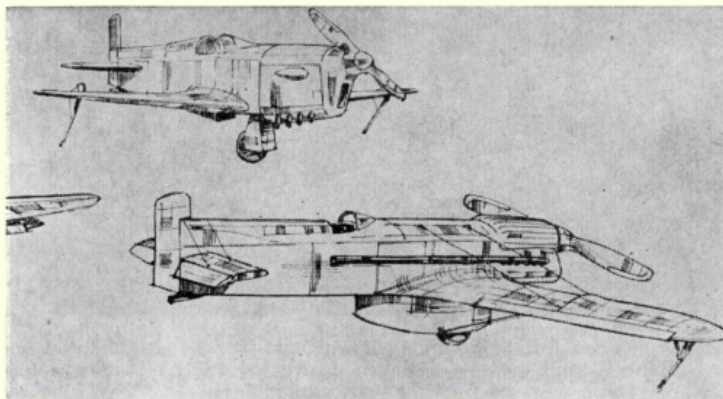


6. The wooden strengthening strips around cockpits and wing seat openings should be cut ready for use, and curved if required before incorporating. Put them in the middle of the laminates if at all possible, or failing this, leave an area of the lay-up sparsely covered with resin to provide a good mechanical grip for adhesives to hold strips to the inside of the opening.
7. When adding formers or cross members to a completed unit, NEVER rely on polyester resin bonding the fitting in place. Always use the slower setting epoxy glues, speeding up the setting by applying heat if required.
8. Always ensure ventilation when working with any resins, and know the first aid treatment for catalyst splashes in the eyes before taking the top from any bottle or jar.

The complete product! Two rough halves have been removed from their glass-fibre moulds, trimmed and then joined. Remember any flaw in the planks will be reproduced in the moulds and show up faithfully in the finished product - so take care.



CONTROL LINE NEWS



Combat International

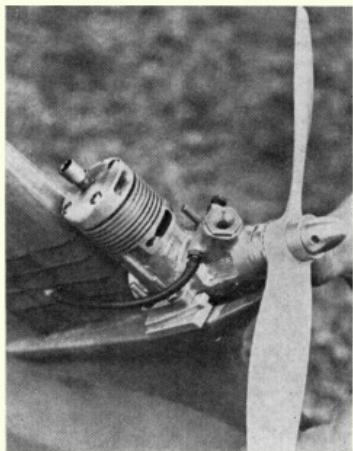
Thanks to J. Carolan, we have news of an International Combat Rally rejoicing under the rather ambitious title of *Coupe de la Europe Aeromodélisme*, which was organised by the 'Model Club des Trois Frontieres', taking place at Longyon Villiers airfield, near the Luxembourg border with France, on June 16th/17th. Five English fliers made the trip, with Steve Bingham of ACE convincingly winning the overall prize with his *Warlords*, and the *Equipe Anglaise* bringing home the team prize after narrowly defeating the Dutch team of Meijer, Van Zip and Streefkerk.

This competition was run to 'interesting' rules, in that each flier took part in four bouts and the scores were then added together, with the top eight going to the quarter-finals. It became obvious from the early stages that the Continentals who flew English-inspired models were going to be the greatest threat, with Johnny Dubell and the Dutchmen going particularly well with M.V.V.S. and tuned Olivers respectively, compared with the standard English Copeman-tuned Olivers.

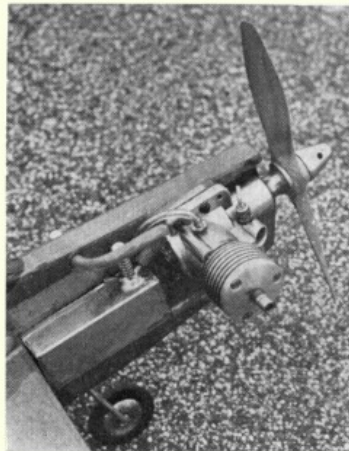
Due to the qualifying system mentioned above, some rather unexpected faces reached the quarter finals, including two gentlemen who seemed totally incapable of even manoeuvring! Steve Bingham and Mick Tiernan were still representing England at this stage, although if *all* the cuts had been counted there would have been four Englishmen and three Dutchmen left in the running. Bingham flew first, and easily defeated his Belgian opponent, but a major setback occurred when Mick Tiernan suffered his only defeat of the weekend at the hands of the

Frenchman, Morelle. Meijer defeated Dubelle and the other Belgian defeated his French opponent in what looked like a team race with streamers.

The above sequence would undoubtedly have led to the best fliers (Meijer and Bingham) reaching the finals, but the organisers re-made the draw, and the semis, therefore, were flown between Bingham-Meijer, plus Morelle and the Belgian competitor. Why the re-draw was made was not explained, but the obvious result of it was that one of the two top fliers would be out! Bingham beat Meijer by a small margin and went on to easily defeat Morelle by three cuts in the final. An interesting bout came after the competition was over, when the organisers asked the finalists to give a demonstration of combat to the local mayor. Relieved of the strains of competition, Steve Bingham flew Mick Tiernan's M.V.V.S. model and absolutely hammered his opponent, taking four cuts from his first streamer and five from a second before neatly flying in front of the Frenchman and making him cut the string on Steve's streamer! This M.V.V.S.-powered model is really superior to anything which our writer has yet seen in combat, being easily started and very fast, while yet turning incredibly tight. John Oliver and George Copeman had better think of something soon or John Daly will be doing a lot of trade!

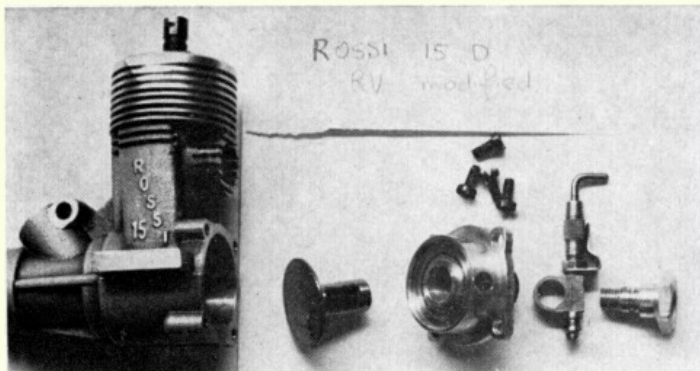


Interesting diesel by Luis Petersen of Denmark (left) seen fitted in a combat model at the Nationals, but originally designed for team-race. The cylinder head is slotted to allow air-cooling of the contra piston, while venturi is raked sharply forward. Note also the front forcing exhaust - exact opposite of latest trends, but at least the leading edge does not get charred. Crankcase is cast in magnesium.



Right. Gig Eifflaender wouldn't recognise this one - Don Haworth's much-modified P.A.W. 19 which is currently one of the fastest Goodyear motors - and that includes the Glows! Crankcase pressure is tapped from side of crankcase. The extended crankshaft length is the result of using ETA components - motor features revised timing for better breathing.

Two views of Henry Helmich's modified Rossi 15D. The induction system is based on Natelenko's 'Start' engine and although it does not bring an improvement in speed, does produce a useful increase in lappage - in fact, the range has increased from 22/26 laps to 34/36 laps. Most useful!



Despite the anomalies in the judging, this was definitely an enjoyable weekend, the social side was superb with the competitors accommodated free of charge at a hostel all weekend, and provided with all meals and even cheap beer! The flying took place in a fenced area with a tarmac centre circle, and all signals were given on a public address system. A competition in which we are sure all will look forward to for participating in again.

FA1 team race engines

With competition getting closer and closer in FA1 racing, enthusiasts are searching harder than ever for 'new' motors. At present the Bugl would seem the best choice, but few are available and the price is not cheap - especially as two identical motors are really needed if one is at all serious about racing. So what else is there on the horizon? Well, if you are a skilled machinist and have a little imagination, then the current 'in vogue' approach seems to be to take a K&B 15 Schneurle-port glow plug engine and convert it to diesel operation. Reputedly this is not too difficult an operation (if you know what you are doing!) as the basic layout of the engine lends itself very well to such a conversion - it has more than a little similarity to the ARM diesel. Already in this country the Clarkson/Daly and Muncaster/Langworth teams have produced such engines, while in Germany Emil Rumpel is also working along the same lines.

The Muncaster engine has had little opportunity to run at present, but the Clarkson/Daly unit looks most promising. They flew it in competition for the first time at the Western Area's 'do' at Fairford, and this is Dave's brief run-down on the results:

Round 1 (5:13). Two pit stops: first tank 'cooked up'.

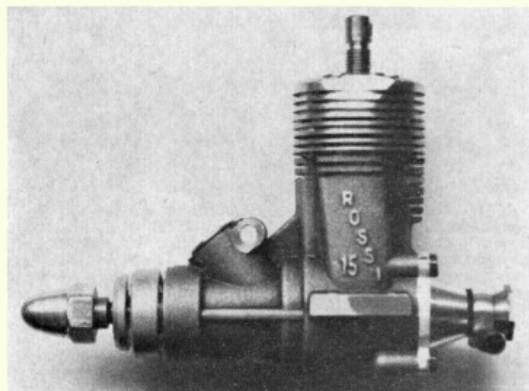
Round 2 (4:53). Two pit stops: One 'fluffed' restart, had to glide last two laps.

Semi-final (4:49). Three pit stops: opened needle to prevent cook-up and 29-30 laps.

Final (9:59). Five pit stops: first and second tanks cooked-up.

In addition, they report that in the final they were keeping pace with Heaton/Rossi's Bugl for the last four tank-fulls, and were achieving 33 laps. And before we run away with the idea of the Bugl's invincibility, it should be remembered that the latter Leigh team have recently recorded a 4:37 with their Eta 15. Indeed, the Bugl is no faster than a good Eta, just more reliable.

Still on the subject of engines, we would just like to clarify that the Rossis used by the Dutch team Helmich/v.d. Kroon are not converted glow engines, but were made as diesels by the factory some two



years ago. Before reaching for your pens to address pleas to *Fratelli Rossi*, remember that these motors never reached production (although listed in advertising literature at one time), and as the current availability of glow Rossi's is virtually zero we suggest you save your stamps!

Incidentally, Henry Helmich also points out that our picture of his pitman v.d. Kroon in the Nationals report in the August issue was wrongly captioned. The model was not a V-tailed *Turtle*, but a Bugl-powered *Moskito Special* with a glass-fibre fuselage. They only used the Rossi model in the first round, then changed to the Bugl for its better range, speed and reliability.

Unusual-looking stunter named 'Wunderbird II' by R. Parsons. This large area 47 oz. ship flies very slowly with its O.S. 35 power plant and is a refreshing change to the traditional stunt design.





John O'Donnell's

FREE FLIGHT COMMENT

The National Free Flight Society chose Ray Monks' FAI Power design as one of their 'Ten Models of the Year'. Quite an honour for Ray to be selected by such an august body, but he certainly deserves it with his consistency, both at home and abroad, together with many important victories.

A FULLER-THAN-EVER contest calendar, combined with tight press schedules and Nationals reports, results in the necessity to refer right back to the end of April in order to bring our readers up to date with the current contest scene. This, if you remember, coincided with a particularly bad period of weather, in fact there are times when even the most hardened competitor must wonder whether free-flight aeromodelling is really compatible with the English climate! Such an occasion was the S.M.A.E. Two-day F.A.I. Meeting held at R.A.F. Strubby over Easter Sunday and Monday. Bank Holiday weekends are always something of a joke from the weather aspect – but even so, this Easter was exceptionally poor. It was very windy for the whole two days – with bright conditions on the Sunday being followed by a cold, misty and wet Monday.

The events naturally suffered from a high 'drop-out' rate – but pre-entries were already down to around 60 per cent of the 1972 figures. Of those who entered, not all arrived, if the number of cars was any evidence. Flying by rounds forces an early decision as regards whether to fly or not – and a lot of those present chose discretion rather than valour. From the casualty rate in the contest's early stage, they were probably very glad.

Flying was in a Rubber/Glider/Power sequence, with 45-minute rounds, and launching had to be from a marked 'starting line'. There were the now customary (and still unresolved) disagreements as to whether the S.M.A.E. or F.A.I. rules should apply. As an aside I would refer readers to the introductory paragraph to Section 6 in the S.M.A.E. rulebook. This passage is, in my opinion, clear-cut and should leave no doubts that it is the S.M.A.E. book that applies. This might seem like a trivial matter, but the differences in the two sets of rules are significant, and can easily affect the outcome of a contest.

Dave Hipperson launches for the Gamage Cup fly off – he travelled all the way from London to fly with the Northern Area at Topcliffe, Yorkshire.

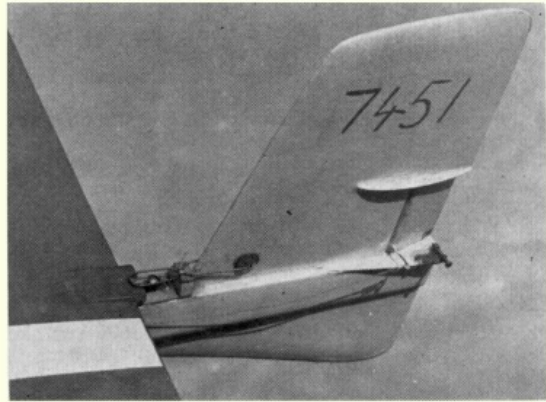


Wakefield and A/2 glider are both 'thermal-catching' events, and in rough weather flights tend to be either good (through finding lift) or the extreme opposite. The Easter meeting was no exception, and many score cards had maxs intermixed with flights of little over the minute. Nevertheless, the events had sufficient entrants to provide some real competition among those prepared to persist. In comparison, F.A.I. Power was almost a 'non-event'. Although this category of model has sufficient potential performance, strength and reliability to cope well with bad weather, there are very few people willing to compete in adverse conditions. The reasons are glaringly obvious – to obtain performance means buying horsepower – and the thought of losing an engine costing £25 or thereabouts is offputting.

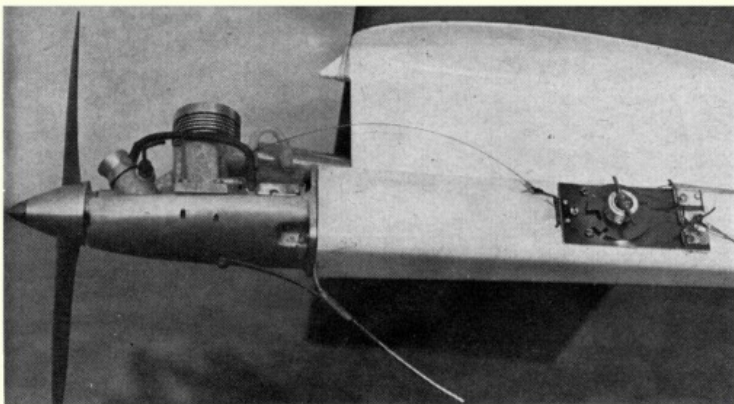
At Easter there were exactly six F.A.I. power fliers in what is supposed to be one of the season's major events. Out of these only three persisted for more than a couple of flights. By the time five flights had been made, Russell Peers was so far in front of Ken Faux and Laurie Burrows that they decided not to continue any further. Russell was using a new taper-tip model with a Rossi and all the usual hardware. This did one poor flight through a slack elastic band on the tailplane giving a stally glide, but the rest were maxs or near enough. The model has a good, stable pattern – but what really matters is that its owner is willing to risk it – and back it up with a reserve if necessary. The last mentioned point proved to be Ray Monks' downfall when he had difficulty in locating his model miles downwind, and returned too late for the third round.

Wakefield saw Joe Barnes jump into an early lead with a double max – but subsequently fail to keep up the pace. The three flights on Easter Sunday left Ian Kaynes and Alan Jack level-pegging. A poor first flight on the Monday morning effectively cost Alan his hopes, as he was never able to

Rear end of Ray Monks' FAI power model reveals linkages to the V.I.T. and auto rudder. Note how Ray uses stiffening ribs to the sheet fin above and below the trim tab.



Business end of the Monks design reveals the timer made from musical box movements parts. A simple but effective flood-off system is used - the wire seen leading from the timer kinks the flexible fuel tubing which leads to the venturi. When the wire is relaxed by the timer (as shown) fuel from the pressurised fuel tank is 'dumped' into the venturi causing the motor to be smartly stopped.



Below, Ken Brown watches for signs of lift at the Sheffield rally. He was last to launch in the flyoff, and was the only one to find helpful air. The unusual shaped tailplane is a remnant!

make up the deficiency. In the final analysis, Ian won by less than 20 seconds, with Alan in second place. I made up a lot of ground with four good flights on the Monday, and ended up in third place. The winner flew one model through-out - and used just three motors for the whole seven flights, which is very much against recommended practice and more than a little surprising. It would be almost true to say that the Wakefield event was won by 'Team Croydon', as Ian had the benefits of a bubble-machine operator, plenty of advice, and retrievers waiting on the downwind peritrack.

Glider is never a nice event to fly in strong wind - as it requires tough wings and nerves to match. John Cooper appeared to have both, as he coped very convincingly with the conditions. This included towing two flights into the ground when the model veered off too far. However, as he lost two A/2s (and a Wakefield) there are many who would rate his win as 'too expensive', although actually he got a couple of models back within days. Moreover, he reckons that he can build an A/2 in three full days!

Runner-up in A/2 was John Boon - nearly 100 seconds short of John Cooper, but closely followed by myself, Mike Fantham and Andy Crisp. Remarkable was the fact that Boon's second place was managed on only six flights, as he had a zero on the Sunday due to first a snapped line and then a broken wing. His 'weaker' reserve held together for four flights on the Monday - if this description can include blowing off a hangar with but a broken tip.

What did register, despite a very busy weekend, was the high standard of flying on the second day. There were not many people flying - but those still 'in the battle' knew what they were doing and seemed untroubled by wind and rain. One example will suffice. The final Wakefield round had some four maxs and one very near-miss out of six scores recorded! Also noteworthy was John Cooper and I both going the whole course in Wakefield and A/2. We made, and retrieved, 14 flights apiece. This contrasts with the 18 recorded in the whole of the power event!

International overtones were in evidence at the North-West Area's *Rootes Trophy* contest at Chetwynd on 29th April - apart from the club team and individual events officially staged, this meeting also provided the last chance for those intending to participate in the *Spanish A/2 Postal Contest* (flyable on any Sunday in April). Having waited all month for the weather to be co-operative, those present at Chetwynd certainly had their patience rewarded. Final results are still awaited, but there are high hopes of very high G.B. placings.

The day started a little breezy - but it was clearly going to be hot and sunny. As the day progressed the wind dropped and the sky eventually clouded over. Lift was plentiful, especially in early afternoon. For the Postal, progressive flyoffs could be (and were) commenced as soon as the five maxs had been accomplished. Four fliers maxed out, and all did the four-minute fly-off. Then Phil Owen dropped to 2:49 through having a crossed line (with me!). Alan Jack, stopping off between his home in Tyneside and college in Southampton, D/T'd a few seconds short of the six-minute max, despite a fully-wound timer. Dave Barnes and I eventually 'dropped' trying for seven minutes - he got 4:40 from his circle-tow model, while I did exactly five minutes. Although flying at widely different times we both found weak lift that petered out.

Naturally enough, some of these flights were made as part of the gala programme. Primarily a team event (and perhaps the last of its kind in the country), the *Rootes Trophy* itself was keenly and closely contested between three clubs - *Falcons*, *Whitefield* and *Liverpool*, who placed in that order. There was under 100 seconds spread in 30 minute plus totals. Even the top three clubs had to struggle to field the full complement of fliers (one apiece in R/G/P and Chuck Glider), surely a sign of the times!

Of the individual events, only Chuck Glider was decided without fly-off, Albert Fathers proving top with 7:04 total



on a best five from nine basis - this included four maxs. Another non-N.W. Area flier, Steve Marriot of Nottingham, was second.

The Open flyoffs were held in what most would consider ideal conditions - overcast and calm. Power saw Pete Harris have transition trouble, Russell Peers find very dead air, and finally Dave Pymm get just a little help for a 4:32 flyoff and first place. In Glider, Phil Owen towed up first to find his own lift - only to be followed promptly by all the rest. Justice prevailed, with Phil getting over seven minutes, well ahead of Terry Dilks and myself. All the models came down well in sight. Terry was using a '1½ Caprice', while everyone else flew A/2s.

Rubber provided a suitable climax. Derl Morley and John Carter flew together, and were the only ones to find real Russell Peers gets ready to light the D/T fuse on John Carter's monster open rubber flyoff model at the Sheffield rally. On a model of this size the D/T just has to work - guess who gets the blame if it doesn't?





Derl Morley makes an energetic launch at the Gamage Cup fly off. Unfortunately this reserve model was off trim and he failed to place in the top bracket.

lift, Derl played it well with an eight-minute D/T – sufficient for an easy second place without the risks of 'going for broke'. Carter's six-foot monster, flown without D/T, was timed for over 16 minutes before dropping behind the immediate skyline – John said he had no trouble in finding his model – just a very long walk!

The second S.M.A.E. Area-centralised meeting was held the following Sunday, 6th May, and had considerable variation in weather throughout the country. This is the inherent drawback of these events, of course. It was the South of England that suffered most. The Southern Area complained of heavy rain and strong wind at Beaulieu. It was only *Plugge Cup* considerations that led the Crookham and Southampton members to fly in F.A.I. Power, and they found it very expensive on models, with lots of damage and several fly-aways – all to achieve scores of only 13 or 14 minutes. Phil Ireland even lost a model o.o.s. in driving rain at 27 seconds!

East Anglia reported the same sort of conditions, and scores, at Watton. The most noteworthy aspect there, was the total absence of any participation in Open Glider – always the most popular F/F event – and especially with such clubs as Norwich and Anglia. In comparison the North of England was more than lucky. At Topcliffe, Russell Peers did 20:52 (with a taper-tip Rossi-powered model) to win the *Hallax Trophy* for F.A.I. Power. He was a mere 20 seconds ahead of Doug Scott. There was then a three-minute gap to third-place man Brian Hooley who flew at Chetwynd.

Both the Open events were dominated by those who flew at Chetwynd. Phil Owen had another good day, winning Glider with nearly four minutes on the fly-off, while his clubmates Tony Evans and Dave Barnes were third and fourth. In between came Gerry Pink of Bristol. The *Gamage Cup* was won by John Carter with a 6:04 fly-off, from an ordinary (330 square inch wing) size model – allegedly because he did not have enough assistants to help wind his behemoth! Again, two Liverpool fliers, Joe Barnes and Ken Brown, were third and fourth. This time the N.W. procession was broken by Dave Hipperson, who drove from London to Topcliffe just to fly on a decent airfield! He was probably very glad, even though the fly-off cost him a model.



There were two rallies on 13th May – at diagonally opposite ends of the country. I attended the *Sheffield F/F Rally*, held at Elvington, near York. Gone are the days when clubs ran events 'on their doorstep'. Now it's a case of which airfield is available!

At starting time conditions were pretty dismal, being cold, wet and windy – making for very little activity. Surprisingly, the wind swung around and the weather improved, and by mid-afternoon it was bright and breezy, so there was plenty of flying. Re-entry was allowed, and this enabled those who started too early to try again.

Even allowing for the weather, glider scores were surprisingly low – with no trebles – although the top three places were fairly close. Winner was John Boon, followed by Martin Dilly and myself, all with two maxs out of three. Dilly wrecked an A/2 attempting his last flight, but then maxed with his A/1. The 'reserve' had already won the Mini event with three two-minute maxs, just edging out my Coupe d'Hiver in the process. Ewan Jones and Barry Kershaw fought out Chuck Glider, finally placing in the order given. Barry lost his usual quota of two models!

Power and Rubber were decided by fly-off. The former had very dead conditions. Even the winner, Brian Martin, caught sink and only recorded 2:39 with his ETA 29 glass-fibre rod-fuselage design. This score compares with just over two minutes from both Dave Pymm and Russell Peers. Doug Scott missed the fly-off through flying late, and then staying downwind to help Alan Cooper extract his model from a tree!

Only Ken Brown found lift in the Rubber fly-off, to record exactly six minutes for an easy win. He left searching until 'later', only to have his model brought back almost within minutes by its finder. Joe Barnes was runner up, while John Carter and Phil Ball completed the quartet.

Unusual in this day and age were 'perpetual', and impressive, trophies for the Open events. These awards have a long history within the Sheffield club, but have not previously been loaned-out. The prize list ran to an award for the best junior score in any single event, and that went to Alan Godden flying Power.

Meanwhile, the *Devon Rally* was in progress at Woodbury Common, near Exmouth. Chris Chapman sent me results and details.

Weather conditions were not too good with a moderate, chilly westerly wind all day. Although models were travelling a long way, it was across a large expanse of common, and no models were lost. Little lift was seen, and the few thermals present were difficult to detect.

In Open Rubber Julian Hopper, all the way from Stanstead, needed only two flights with his rugged, fast-climbing, open model to eclipse the opposition, who were flying Wakefields. Open Glider was keenly contested. A number of people managed one max, but had trouble backing this up. A/2s probably had the advantage in the turbulent conditions, though Phil Ireland placed third with his A/1. Peter Scrivens and J. Stead took the top two places.

The Open Power winner, S. Goodwin, had a very fast-climbing model, based on the *Dixielander*. It had an elderly G.15 on pressure and straight fuel, V.I.T., and 24 oz. a.u.w.! John Hook used an O.S. 40 powered *Woodpecker*, while Chris Chapman flew a Cox TD 15 *Eureka*-style design.

All-in F.A.I. had a mixed bag of A/2s, power models, and Wakefields. Pete Scrivens flew consistently well to win with his A/2, while Mike Wills was second with his 'rough weather' power model. The description translates as being regarded as semi-expandable – having only an ETA 15 for power. Although outclassed by a Rossi, a well-trimmed model of this type can be most useful on a bad day.

Those familiar with the activities of the N.F.F.S. (National Free Flight Society) in the U.S.A. will know that they stage an annual symposium at their Nationals. Most of the proceedings are quite technical – but this is counterbalanced by the selection of 'ten models of the year'. For 1973, British representation is provided by Ray Monks' F.A.I. power design. Selection is based on a number of factors, and Ray's consistency on the International scene (many G.B. team places, plus a double win at the Pierre Trebod) must have weighed heavily. The N.F.F.S. produce a very professional Symposium Report, and one which is obviously aimed at those with some interest in the theory of model aerodynamics.

Phil Ball seen at fly off time at the Sheffield meet, held at Elvington. He was unable to find any useful air and had to be content with fourth spot.



Mike McAsey is one of the few modellers to fly both contest and sport - here he is seen after the comps with a rubber-powered delta. Very sensitive to trim!

Attending Continental contests is a growing trend for British modellers of all types and the latest among these was Mike Woodhouse, who sent us the following report from the *Sixth Internationale Wettewerb Fur Freiflugmodelle* held over 30th June-1st July at Frattnanger Heide, Munich.

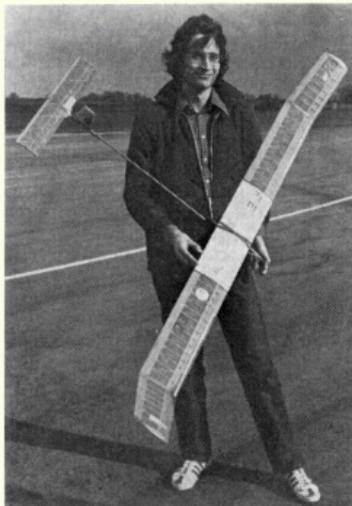
The competition was held in hot conditions on an almost perfect field. Over 200 entries were made from Germany, Austria, Italy, France, Switzerland and three from Britain (the first-ever British entry). The organisation was the usual efficient German variety, even if they announced the event would start promptly half an hour late! One point that did emerge was that what we considered quite an acceptable breeze was proclaimed as strong wind by the locals!

The competition itself is best described by events. The Power contest went to a second fly-off, Sigfried Reda lost out by over-running on the six-second fly-off - his model clearly being the best. Many competitors seemed incapable of handling the increased power of the latest Rossi's.

In Wakefield I managed tenth place, spoiling a decent score with a 90-second flight, the model sinking despite the fact that the 'bubbles' went up! Reine Hofsass won with a new *Espada*, the original having been stolen at Zell Am Zee.

The A/2 fly-off was not held as the 'wind' prevented the two Austrians deciding the winner. A tie resulted for third place between a lady and former World Champion Anton Bucher, who generously gave the place to Gertrude Steiner. Our glider attempts were not in the running, with scores of around 500 secs. each.

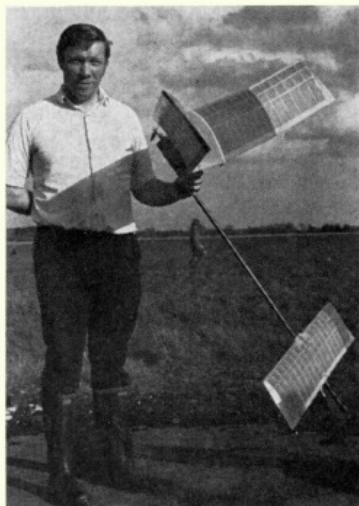
Francisco Abad, from the Canary Isles but in England for a few months, with his British style 'Tenerife' A/2 design.



Russell Peers with FAI power model that won Easter event and also had a good score (20:52) in the Halfax Trophy.



Power winner at Elvington was Brian Martin with glass fibre rod design featuring Dixielander influence. Eta 29 power.



Results

S.M.A.E. EASTER F.A.I. MEETING - Strubby, 21st-23rd April. Wakefield (29 entries, 14 flew): 1. I. Kaynes (Croydon) 17:52; 2. A. Jack (Southampton) 17:33; 3. J. O'Donnell (Whitefield) 16:54; 4. J. Cooper (Southampton) 14:41; 5. J. Barnes (Liverpool) 14:05; 6. M. Evtat (Northampton) 11:33. **A/2 Glider** (49 entries, 21 flew): 1. J. Cooper (Southampton) 17:46; 2. J. Boon (Falcons) 16:09; 3. J. O'Donnell (Whitefield) 15:49; 4. M. Fantham (Richmond) 15:46; 5. A. Crisp (Oxford) 15:34; 6. P. Stewart (Crookham) 15:06. **F.A.I. Power** (19 entries, 6 flew): 1. R. Peers (Falcons) 13:11; 2. K. Faux (Anglia) 8:56; 3. L. Burrows (Blackheath) 7:53; 4. R. Monks (Birmingham) 5:56; 5. P. Harris (Evesham) 2:09; 6. M. Dilly (Croydon) 1:29.

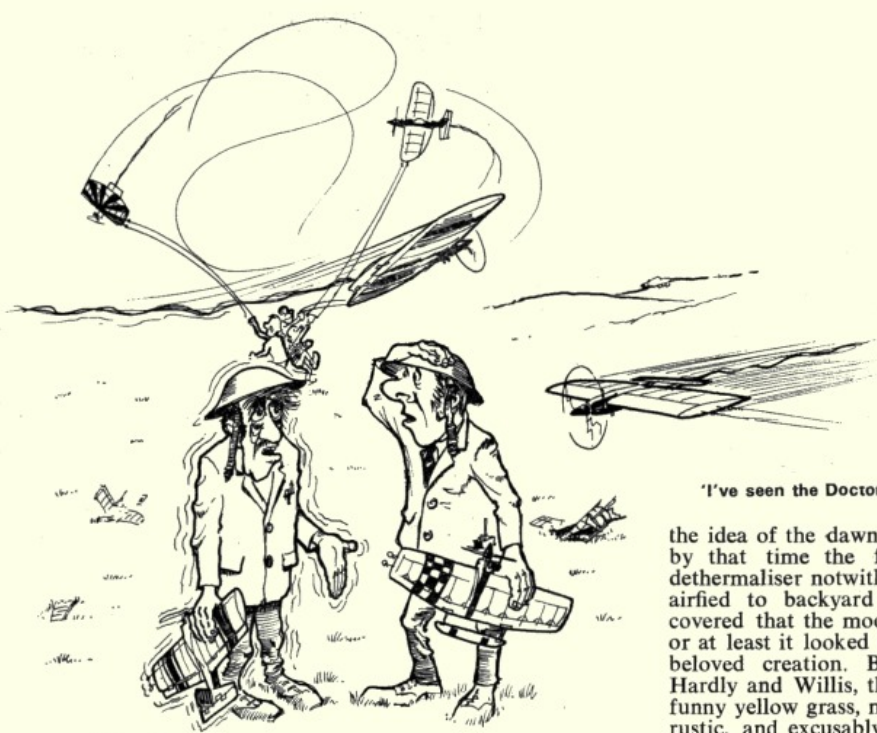
N.W. AREA 'ROOTS TROPHY' MEETING - Chetwynd, 29th April. Team Totals: 1. Falcons 32:31; 2. Whitefield 31:24; 3. Liverpool 30:52. **Open Rubber** (12 entries): 1. J. Carter (Falcons) M+16:44; 2. D. Morley (Liverpool) M+8:31; 3. K. Brown (Liverpool) M+5:06. **Open Glider** (20 entries): 1. P. Owen (Liverpool) M+7:03; 2. T. Dilkes (Falcons) M+5:38; 3. J. O'Donnell (Whitefield) M+5:00. **Open Power** (11 entries): 1. D. Pymm (Birmingham) M+4:21; 2. R. Peers (Falcons) M+3:14; 3. P. Harris (Evesham) M+1:30. **Chuck Glider** (13 entries): 1. A. Fathers (C/M) 7:04; 2. S. Marriot (Nottingham) 6:44.

SHEFFIELD S.A. FREE-FLIGHT RALLY - Elvington, 13th May. **Open Rubber** (13 entries): 1. K. Brown (Liverpool) M+6:00; 2. J. Barnes (Liverpool) M+4:01; 3. J. Carter (Falcons) M+3:18; 4. P. Ball (C/M) M+2:21. **Open Glider** (27 entries): 1. J. Boon (Falcons) 8:51; 2. M. Dilly (Croydon) 8:45; 3. O'Donnell (Whitefield) 8:40. **Open Power** (18 entries): 1. B. Martin (Tynemouth) M+2:39; 2. D. Pymm (Birmingham) M+2:10; 3. J. Peers (Falcons) M+2:07; 4. D. Scott (Morley) 9:00. **Mini** (8 entries, 'K' Factor used): 1. M. Dilly (Croydon) 6:00; 2. J. O'Donnell (Whitefield) 5:54. **Chuck Glider** (18 entries): 1. E. B. Jones (Sunderland) 4:39; 2. B. Kershaw (Wigan) 4:16. **Best Junior Score:** A. Godden (Leeds) 5:46.

2nd S.M.A.E. AREA CENTRALISED EVENTS, 6th May 1973 **Open Glider** (52 entries) 1 P. Owen (Liverpool) M + 3:51; 2 G. Pink (S. Bristol) M + 1:54; 3 A. Evans (Liverpool) 8:48; 4 D. Barnes (Liverpool) 8:36. **Halfax Trophy-F.A.I. Power** (28 entries) 1 R. Peers (Falcons) 20:52; 2 D. Scott (Morley) 20:31; 3 B. Hoolley (Whitefield) 17:30; 4 P. Harris (Evesham) 15:58. **Open Rubber-Gamage Cup** (27 entries) 1 J. Carter (Falcons) M + 6:04; 2 D. Hipperson (Croydon) M + 5:53; 3 J. Barnes (Liverpool) M + 5:42; 4 K. Brown (Liverpool) M + 5:25. **Plugge Cup** (after two events) 1 Norwich 438 points; 2 Crookham 414 points; 3 Leeds 363 points; 4 Southampton 349 points.

DEVON RALLY, WOODBURY COMMON, 13th May 1973 **Open Rubber** (4 entries) 1 J. Hopper (Standstead) 6:00; 2 J. H. Gunn (Bristol & West) 4:42; 3 C. J. Chapman (Torbay) 4:21. **Open Glider** (11 entries) 1 P. Scrivens (Cheltenham) 6:57; 2 J. Stead (Southampton) 6:45; 3 P. Ireland (Southampton) 6:24. **Open Power** (7 entries) 1 S. Goodwin (Southampton) 8:47; 2 J. Hook (Southampton) 8:42; 3 C. J. Chapman (Torbay) 7:56. **All-in-F.A.I.** (5 flights, 13 entries) 1 P. Scrivens (Cheltenham) 11:46; 2 M. K. Willis (Torbay) 10:03; 3 G. Pink (S. Bristol) 9:24. **Chuck Glider** (5 flights, 8 entries) 1 R. Cummins (Bristol & West) 3:19; 2 B. Hyde (Torbay) 3:12; 3 B. Silcox (S. Bristol) 3:12.

SIXTH MUNICH INTERNATIONAL (Switzerland) M+180+71; 2. Power (32 entries): 1. P. Maurer (Switzerland) M+180+71; 2. S. Reda (Germany) M+180+0; 3. R. Truppe (Austria) M+115; 4. V. Horcicka (Austria) M+112. **Wakefield** (33 entries): 1. R. Hofsass (Germany) 1260; 2. F. Gansil (Switzerland) 1251; 3. H. Kollwig (Germany) 1241; 4. G. Rupp (Germany) 1237; 5. M. Woodhouse (G.B.) 1154; 33. W. Parker (G.B.) 51. **A/2 Glider** (115 entries): 1st equal, J. Ployer (Austria) and W. Zach (Austria) 1260; 3rd equal, A. Bucher (Switzerland) and G. Steiner (Germany) 1213.



topical twists

by 'Pylonius'

illustrated by 'Sherry'

'I've seen the Doctor, he suggests I take up a hobby.'

Nut Cases

A character has appeared at a model meeting wearing a wartime German steel helmet. This raises some conjecture. Was he (a) He'l's Angel who had run out of petrol. (b) Martin Bormann. (c) Someone who had jammed the helmet on and could not get it off (in which case he should have been sent to the local hospital's *Jerry Hat Trick Unit*.) Or (d) A genuine Vintage modeller?

He might, of course, have been wearing the hat for legitimate protection, trendy though it might be.

'Why are all those men wearing tin hats, Daddy? They're pit men.'

'Pit men? Then where's their little lamps?'

Sonny could then perhaps be told that the reason the pit men wear the helmets is that they just cannot reach the models from outside the circle. This condition is known as pitman's shorthand.

In my opinion the danger of flaunting all this protective headgear is that it can all too quickly become compulsory for all modellers, and, as far as model flying freedom is concerned, would just about put the tin hat on it. At any moment the powers that be could start softening us up with a telly campaign recommending tin hats and flak jackets for all, and asking us to put on our hats and fasten our jackets when we fly. Or *'Now don't forget: it's plonk-zip every flip'*.

Being a somewhat timid soul I find all this armour plating a bit frightening. Our flying fields, which were once havens of quiet recreation, are fast becoming a cross between the Battle of Britain and the London blitz.

'He deserves to have a holiday, poor dear.'

'How will he spend it. Doing a spot of model flying?'

'No, that's what he's taking a holiday from.'

They Fly at Dawn

What was demonstrated by that rather desperate early morning turn out at the Nationals was the sad fact that the free flight model has long outgrown its boots. So long ago, in fact, that history begins to repeat itself, for it was back in the early fifties that

the idea of the dawn patrol was first conceived. Even by that time the free flight model, new fangled dethermaliser notwithstanding, had shrunk the largest airfield to backyard proportions. It was then discovered that the model flyer had seven league boots, or at least it looked that way when in pursuit of his beloved creation. But seven league or Freeman, Hardy and Willis, they just scythed through all that funny yellow grass, much to the annoyance of certain rustic, and excusably apoplectic, gentlemen.

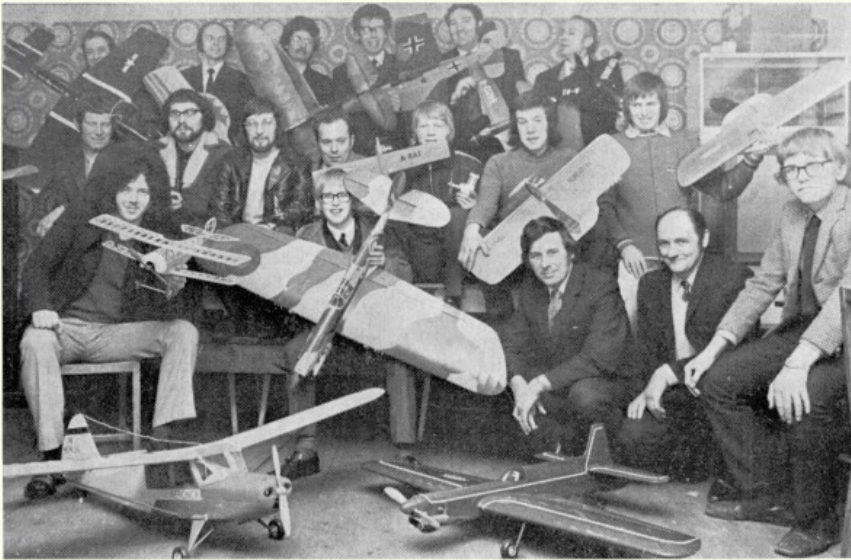
Now it's a curious – and seemingly wasteful – quirk of nature that the wind blows softest, or not at all, during those daylight hours when all law abiding citizens are abed. What better, thought the pundits, than to fly in the early morning calm, and thus avoid the danger of widespread famine. And so it was that the hapless flyers were flushed from their pads into the cold light of dawn.

At that unearthly hour the damp rises something chronic, leaving the model as soggy as a plate of over-night cornflakes. And it had a nasty habit of coming up in an opaque shade of white, of a 20 secs. o.o.s. quality. Often, too, the wind switch off mechanism failed to operate in accordance with the natural laws, and so the whole hopeful project was reluctantly abandoned.

A Lot of Fuzz

Shades of the past again in the expanding sizes of models at Open Glider events – the standardised A/2 no longer having things all its own way. To people used to the ubiquity of the desiccated A/2 it might come as a surprise to learn that back in more primitive times Open Gliders came in all manner of shapes and sizes. They even had old fashioned things called fuselages. Where there is now a slight bump and a sprig of fishing rod, there would be a voluminous, nose to tail spread of contoured balsa. Perhaps the models did not fly quite so well as their modern counterparts, but considering the comp entries were about ten times as big as they are at present, it was something to be thankful for.

Also making a bit of a comeback is something we older modellers thought had long been consigned to limbo: the rubber powered scale model. When the first diesel engines appeared on the model scene there was wild rejoicing in the ranks of the scale modellers, who saw in the scale type propellers and unlimited energy the millenium of scale flying, but human nature being the perverse thing it is, cannot live long with perfection, and where the tiny, whirring air-screw used to be there is a couple of dirty big paddles, and all that abundant motorised energy has been replaced by the knotty uncertainties of the short lived rubber motor.



CLUB NEWS

Wide variety of interests evident in this picture of the Nuneaton club, with a strong control-line following. How many clubs can boast such a good turn-out of models at their club night? This picture from the Nuneaton Observer also shows a live wire P.R.O. - why not get your club's activities reported in the local press?

CLUBS AIN'T WHAT they used to be, or are they? If there have been any radical changes in club life over the past two decades or so it is due to two main factors. One is the swing-away from the small, light-weight model, suited to parks and small open spaces, to either long ranging free flight models or large controlled models, C/L or Radio. The other factor is the change over from public transport to the private car. Most people who go out model flying today transport their models by car; very few use bus or train.

These factors do, I feel, put the younger modeller or would-be modeller at a disadvantage. Very little serious flying is now carried on at local open spaces, and all too often he lacks the transport to reach the distant venues. More and more it seems the typical model flyer of today is the man of mature years rather than the youngster who typified the movement back in the fifties. Nevertheless, there still exists the scope for all ages and all incomes within the hobby; you can have a lot of fun and serious flying without resort to a great deal of expense, and quite near to your own doorstep.

Pointing the way, perhaps, in this direction, is the recently formed **Alfreton Model Aero Club**. The club, in effect, opens up a control line option in a district (Derbyshire) where a number of radio clubs already operate. The club has a good mix in its 28 strong membership: half adult and half junior. Fees are by no means off putting at £1, with juniors allowed to pay quarterly. The club flying ground is the playing fields of the Mortimer Wilson Comprehensive School, thanks to the good offices of Mr. Dawes, the Headmaster, himself a past modeller. The club meets every Tuesday night at 7 p.m., at the Boy Scouts H.Q., Hostel Site, Alfreton, and flying sessions are held on Sunday afternoons. Secretary is Mr. Paul Dranfield, Laundry Cottages, Alfreton.

Perhaps typical of the new modern style club is the somewhat ponderously titled **Derbyshire Radio Operated Model Engineers Society**, the initials of which happily and aptly spell out the word 'Dromes'. The club is being formed at Hatfield, near Glossop, and is indeed affiliated to the Hatfield R/C Model Eng. Group. The facilities include a large mown and rolled flying area, with a special area for cars. There is also a slope soaring site nearby and a stretch of water for power boating is being negotiated. Membership is limited and applications, accompanied by a

S.A.E., should state age, type of models, equipment, frequency, proof of insurance and licence, and experience, and should be sent to 92 Mottram Old Road, Gee Cross, Hyde, Cheshire SK14 SNJ. The club is holding a Scale and Multi Rally on Sunday, September 16th. Venue not given, but no doubt all information given on pre-entry response. Fee 30p per model to Mr. Gwlml Lloyd at above address. Envelope to be marked 'Warden'.

News of the contest activities of the **Croydon & D.M.A.C.**, is sent to us by Mr. M. L. Wood. Prominently featured in early S.M.A.E., Centralised events was Dave Hipperson. He picked up a couple of second places in the Open Rubber contests, and gained another second in Open Rubber at the Nats. But that first place still eludes him. However, a first place for another Rubber man, Ian Kaynes. He won the two day Wakefield event at Strubby. Not so lucky, though, at Arnheim, where history repeated itself in the defeat of the six strong Croydon glider invasion. As in 1944 the Germans won! Top Croydon man was Martin Dilly with a creditable 4th place in A/2. Next came John Woodhouse (Norwich, surely) and Jack North in 28th and 40th places. In the Wakefield event at the same meeting Ian Kaynes occupied 7th spot with Norman Elliott taking 11th place. John Mabey had the misfortune to destroy two models in the first round and retired.

The newsletter of the **Sittingbourne & D.M.A.C.**, is titled the *Bourne Flyer*, but if flyers are born, marriages are made in heaven, though you would not think so from the 'Obituary' notice which proclaims the entering into wedlock (. . . that country from whose bourne no modeller returns . . .) of member Raymond Ewart. The ceremony however was an all aeromodelling affair with a C/L groom. R/C best man and F/F photographer, and this gives hope that Raymond will remain in circulation. Contests which get a mention in the newsletter are at technological extremes: pylon racing and chuck gliding, but prowess in each earns points in the 'Best All Rounder' event. The Pylon Pot went to Mick Munn, but John Ripley leads as the Best All Rounder by knowing what his right arm's for. We learn from the newsletter that, much to the discomfiture of babies and power modellers, there is a world shortage of castor oil and this has put up the prices of the club's home-made brews, though still quite cheap.

A lovely ironic comment introduces the first news-

letter of the **Worcester M.A.C.** It says The Annual General Meeting, or . . . 'If I'd been there, I'd have told 'em a thing or two . . .' News from the A.G.M., is of a healthy membership figure of 45, and of an equally healthy financial position. The club calendar suggests an across-the-board range of interests, with events in the three main categories: R/C, C/L and F/F. In September it is hoped to run a Slope Soaring Cross Country event at Malvern. This to be an Open event on a pre-entry only basis. Keith Bullock, the P.R.O., tells us that the club was known as the Worcester Sky Pals, and any unattached modellers who would like to join the club are welcome on Wednesdays at 8 p.m. at 35 Perdiswell Park, Droitwich Road, Worcester - off the A38 by the A.T.C.

It's all the big Radio stuff when the **Flying Druids** take the air, and newsletter talk is of pylon racing, spot landings and other derring-do. However, there does seem a little disquiet over the prangs that have occurred to many a delicious low wing aerobatic model. Prangs will, of course, occur - model planes being as exciting as they are vulnerable - but the large aerobatic models have a way of writing themselves off too completely, with framework a splintered mess and engine and radio frequently damaged. Now some fly-for-fun types are looking for something more bounceable, and there are various approaches: powered gliders, small pylon racers and even the old Super 60 air bus. In my opinion damage is always relative to the surface encountered. For maximum salvage try flying over marshy ground!

A letter from Mr. D. T. Meinert, Vice-Chairman of the **Peterborough M.F.C.**, says that the club has been through a difficult time; losing their free flight field and suffering a membership drop as a result. Things are looking up again, however, with an increase in activity this season. The Combat flyers displayed their talents to good effect at the Nationals, and with their friends in Lincoln, have been putting on demos in the district. Flying field loss notwithstanding the free fighters are making a name for themselves in the Area events. The club is fortunate in having workshop facilities available two nights a week at the Lincoln Road Youth Centre, 8 p.m. start, and a welcome to all who may be interested.

The **Feltham & D.M.A.C.**, C/L Rally on June 17th had all the ingredients for success; fair weather, a whopping entry, with contestants coming from as far as Bristol and Leeds, and a good, friendly atmosphere. Speed flying, is still very much a going concern at Feltham where John Dixon and Martin Radcliffe have been skipping round the yoke to some purpose. John did well, too, at the Nationals, as did the Harknett/Smith Goodyear team, although they were hoping for success in F.A.I. T/R. Seems they were up against some stiff foreign competition which really had things organised. Plaintively they ask: should we stick to Combat? Anyone interested in joining 'the number one' C/L club in the South East would be welcome at Fanshawe School, Bedfont, on Tuesday evenings at 8 p.m.

A quirk of the Town and Country Planning Act comes to light in the **Watford Wayfarers M.A.C.**, newsletter. According to the item concerned the club could have trouble getting planning permission if they use the club flying site for more than 28 days per year. Advice given here is to strengthen the hand of the S.M.A.E., to deal with situations like this.

The C/L Scale experts of the **Three Kings Aero-modellers** were upset by the scaled up wind at the

Nationals, according to a report in *Court Circular*. It spoiled what promised to be a first class Scale contest of 13 operative entries. Top placed 3K member, Dave Cordwell, might well have done better than fourth with his *Heston Phoenix*, but his Merco ran out of steam when the wheels were only halfway down and the outboard wing broke off on impact. Dave Morbin and Allan Westlake both had nosing over troubles and couldn't get airborne. Dave Morbin's entry, a Spitfire Mk. I, took the 'Model of the Month' honours, and with every good reason. Or perhaps many reasons: the transistor operated retract undercart, throttle control, and a sliding canopy with full cockpit detail.

Free flight modelling being now the specialised thing it is, the Area entry lists are short, but no doubt sweet. A goodly part of the Third Area Meeting support would appear to have come from the **South Bristol** club, according to the results given in the *South Bristol News*. Weather was good, but only Richard Greenslade in Open Power seemed to be finding a full share of the fair amount of lift reported. The Bristol club is also strong in C/L. In the Combat Rally at Feltham R. Evans flew magnificently to beat a large field of 35 top flyers. He repeated the success a week later at Finchley against an equally formidable field.

It was a sticky decision when Ricky Shaw dubbed the **Sussex Radio Club's** newsletter *Flypaper*. The same Mr. Shaw gives details in the newsletter of the club contest programme. All appear to be Radio Glider of one sort or another, and one of the others is a new style event known as Hi-Start Aerobatics. Models are towed up by an electric winch to give, in effect, slope soaring on a flat field, but without the constant surge of uplift. All events referred to are sited either at the Angmering field or the Long Man slope.

This is the time of the big comps in North America; the Free Flight ones of which are publicised in *W.M.C. Patter*. A wide range of events is covered in the North West F/F champs, even down to Rocket (Jetex). Then there is an all 'Oldie' do, and a 'Silents Please' event, where the hush-hush models: Glider, Rubber and Rocket, like good children, can be seen but not heard.

Randy Bunch does not describe a group of permissive age model flyers, but is the name of a free fighter who took home the 7 ft. hardware as Grand Sweepstake winner in the U.S.F.F. Champs. No, he didn't win a game of aerial bingo, but took top placings at most events. According to the **San Valeers Satellite** the famous Taft boomers were in full operation at the contest, giving the top B. Class man a winning flight of 41 minutes.

It is boom time in New Zealand we learn from an editorial in *South Island News*. It is good for the model trade, for like Mustard a lot of the model flying goodies that affluence buys remain on the plate, as it were. And it does not encourage a proper apprenticeship when you start out with a high output engine and the latest prop equipment; you either sink or swim. But if the big spenders buy their technology the free fighters still put a lot of ingenious hand-workmanship into their products. A dazzling display of this is to be seen in the plan of Alan McDonald's winning Nats Wakefield.

It's been a long, hot summer, but too much wind for my liking. **Clubman**

Contest Calendar . . .

August 19th	S.M.A.E. INDOOR MEET. Second Team Trials for F.A.I. class models at Cardington.
August 26th	WOODFORD RALLY. F/F: Open R/G/P, Mini Comp, Chuck glider, Scale (Eddie Riding Trophy). C/L: Goodyear, F.A.I., Class B Team Race, Stunt, Combat, Handicap Speed, Scale. R/C: Class II scale. Entry to airfield from 9.30 a.m. Venue: Hawker Siddeley's airfield at Woodford, Cheshire.
August 26th	TORBAY RALLY. Open R/G/P. All-in F.A.I. (Torbay Trophy) five flights, no rounds. Chuck glider, re-entry allowed. Venue Woodbury Common, near Exmouth.
September 2nd	THREE KINGS C/L RALLY. Stunt and scale at old Croydon Airport, Silencers essential.
September 2nd	NORTHERN AREA RALLY. 30+ classes!! for C/L, R/C and F/F at R.A.F. Elvington, Yorks.
September 2nd	ASHFORD RADIO MODELLERS RALLY. Class II Scale, fun and novelty events. R/C licence and proof of insurance essential. Details: M. Tate, 60 Towers View, Kennington, Ashford, Kent. Tel. Wye 812 443.
September 2nd	MIDLAND AREA RALLY. C/L: Stunt, F.A.I., Goodyear. Combat. R/C: Eyeball scale, spins, spotlanding, fly-for-fun. Venue Wymswold Airfield, near Loughborough, Leics.
September 7-9th	INTERNATIONAL F/F EVENTS. Sponsored by 'Free Flight News' at R.A.F. Strubby, Yorks.
September 9th	WOLVES C/L FLY-IN. Scale, Stunt, Goodyear, and Carrier Deck comps., plus sport flying. Short grass surface. 25p per comp. Details and pre-entry (preferred) from S. B. Perry, 9 Tong Close, Bishops Wood, Staffs. Refreshments and parking available. Venue: Lucas Aerospace Sports Ground, Fordhouses, Wolverhampton. 9 a.m. till dusk.
September 16th	S.M.A.E. INDOOR MEET at Cardington.
September 16th	S.M.A.E. 5th AREA CENTRALISED MEET. Team power, F.A.I. rubber, A/1 glider. Area venues.
September 23rd	SOUTH MIDLAND AREA RALLY. F/F: Open R/G/P, Wakefield (Ted Evans Memorial), Tail-less, Chuck, Helicopter, Junior Kit. C/L: Combat, Aerobatics, Goodyear and F.A.I. Team Race, Speed, Junior Stunt. R/C: F.A.I. Aerobatics, Class II scale. Pre-entry R/C aerobatics only: D. Giles, Derron, Station Road, Bow Brickhill, Bletchley, Bucks. Note: Scale Blue and Brown frequencies only. Aerobatics R. O. Y, G only.
September 29th	NORTHERN GALA. Open R/G/P, C/L, 1/2A, F.A.I. and B team racing, R/C aerobatics.
September 30th	SOUTH BRISTOL M.A.C. AUTUMN GALA. Open R/G/P/ Vintage Precision. Chuck glider, R/C Thermal Soaring. S.M.A.E. members only at R.N.A.Y. Wroughton.
September 30th	LIVERPOOL GALA. Open Rubber, Power Combined Mini, Chuck glider, A/2 (5 rds., progressive fly-off). 10 a.m. start.
September 30th	3rd WESTERN AREA C/L RALLY. Class B, Goodyear, Combat at R.N.A.Y. Wroughton. S.M.A.E. members only.
September 30th	S.M.A.E. F.A.I. PYLON RACE at North Luffenham, Rutland.
October 14th	S.M.A.E. TEAM TRIALS for 1974 World Champs. F.A.I. Speed, Team Race, Aerobatics at R.A.F. North Luffenham, Rutland.

THIS ECONOMY CRAFT TOOL CUTS RIGHT ACROSS ALL OTHERS FOR VALUE!

We designed this knife for all light cutting purposes - the quality is high - the price is low. Three spare blades in different shapes are available, making a cutting tool of unbeatable value for money.



Swann-Morton

SWANN-MORTON LIMITED
PENN WORKS, OWLERTON GREEN,
SHEFFIELD S6 2BJ, ENGLAND.

THE FINEST
VALUE FOR
THE HOBBYIST
HANDYMAN,
MODELLER,
AND D-I-Y
ENTHUSIAST

KINDLY MENTION 'AEROMODELLER' WHEN REPLYING TO ADVERTISEMENTS



THE MIDLANDS LEADING MODEL SHOP - WORLD-WIDE MAIL ORDER SERVICE

S. H. GRAINGER & CO. CALDMORE MODELS

108 CALDMORE ROAD, WALSALL WS1 3RB, STAFFS.

(1 MILE FROM M6 MOTORWAY JUNCTION 9)

TEL. WALSALL 23382

RADIO CONTROL

Swan Propo	from	£60.00
Gem Propo	from	£34.00
Skyleader Propo	from	£65.00
Sprengbrook Propo	from	£75.00
Futaba Propo	from	£109.00
Remcon Kit Propo	from	£98.00
MacGregor S/Channel	from	£11.95
MacGregor		
Proportional	from	£36.00

All types servos, actuators, deacs, etc

ENGINES

Merco
Super Tigre
O.S. P.A.W.
Enya
K&B E.D.
Rossi OPS
H.P. Veco
Davis Charlton
Webra

KITS

KeilKraft
Graupner
Topflite
Sterling
M.F.A.
Goldberg
Aviette
RipMax
Helgi

BOAT KITS

Aerokits
Billings
Veron
Monday
Graupner
E.D.
Norstar
Mainstream
Simplas

ACCESSORIES

Micro Mold
X-Acto
M.F.A.
DEACS
Electric Motors
Chargers
Boat Fittings
Tanks
Wheels

MATERIALS

Solder
Balsa
Humbrol
Fibreglass
Solarfilm
Nylon
Fuel
Paints
Buoyancy Foam

Fibre-glass Marine Models including the popular 1/12th scale Surfury and Cigarette Mail
Order catalogue 10p. Discount deals from £25. Paybonds accepted. Part exchanges.

EVERYTHING FOR THE MODELLER

GLIDERS		RUBBER POWERED	
K.K. Caprice 51" Span	£1.61	K.K. Senator 32" Span	77p
K.K. Minimoa 49" Span	89p	K.K. Ace 30" Span	66p
K.K. Invader 40" Span	89p	K.K. Gipsy 40" Span	£1.34
K.K. Aquarius 73" Span	£5.67	K.K. Ajax 30" Span	77p

RADIO CONTROL: SINGLE CHANNEL OR PROPORTIONAL
By MacGREGOR. LIST S.A.E.

KEILKRAFT, MERCURY, MOTORS. LISTS S.A.E.

POSTAGE: 10% of order up to £5 - Minimum 10p
Over £5 post free (U.K. only)

JONES BROS. OF CHISWICK

56 - 62 TURNHAM GREEN TERRACE, LONDON W.4.
(Phone 01-994 0858)

Hours: Mon., Tues., Wed. & Sat. 9 a.m. - 6 p.m.
Friday 9 a.m. to 7 p.m. Closed all day Thursday

NJM

FOR RADIO CONTROL AIRCRAFT KITS & ACCESSORIES

PRICES INC. V.A.T.		RADIO CONTROL BY MACGREGOR	
SECOND-HAND EQUIPMENT		Single Channel	from £13.95
Cox 010 Tee Dee	£4.45	Digimac 1+1, 2 servos	£42.00
PAW 2.5 c.c.	£4.40	Digimac 2, 2 MR10Ps	£52.00
AM 25	£3.50	Digimac 3, Tx, Rx, Deacs	£49.00
Fox 35	£3.99	Digimac 4, Tx, Rx, Deacs	£70.00
		MR10P servos each	£11.00

NEW MACGREGOR			
Mini servo MR12P	£13.00	Kwikbilt Spitfire 63" inc. foam-cored wings, suitable for 40-61 engines	£20.95
		SLEC: Hinge (10) 38p	Horn (2) 12p

Solarfilm
Solid Colours 26" 65p/yd.
Metal-flake Silver, Gold 74p/yd.
Kavan El. Starter £13.30
2v. 7AH Accumulator £12.20
Enya Engines, Silencers, Merco Engines and Silencers, O.S. and E.D. Engines always available.

EASY CREDIT TERMS THROUGH PAYBONDS & BARCLAY CARD
Second-hand equipment bought and part exchanged
STAMPED ADDRESSED ENVELOPE WITH ALL ENQUIRIES PLEASE
NORWOOD JUNCTION MODELS LTD. Hours: 9.30-6;
Wed 1 p.m. Fri 9.30-7

3 Orton Bldgs. Portland Rd., London, S.E.25 Tel. 01-653 4943



SCHUCO BELL-HUEY-COBRA

Dieter Schlüter's sensational remote-controlled 'chopper' in easy-to-assemble kit form. Moulded glass-fibre plastic fuselage. Ultra-precision manufactured mechanical components. Easily followed building instructions.

FUSELAGE plus WOOD & HARDWARE KIT £45.00
COBRA MECHANICAL PARTS KIT £110.00
ROTOR HEAD only £26.50
ROTOR BLADES (pr) £22.30
SILENCER (Veco 61) £6.50

OTHER SCHUCO AIRCRAFT KITS INCLUDE:

SULTAN 47¼" span	£3.30	SPASSVOGEL 50¾" span	£4.95
TWEN 55" span	£6.45	PAT 47¼" span	£5.65
SB-7 90½" span	£12.95	KADI 74" span	£12.50
EMIR 110" span	£21.00	ASH-15 115" span	£35.50
ALADIN 84" span	£16.95	HEGI 70 3/8" span	£9.45
FOKKER D-8 50" span	£12.95	L-19 BIRDDOG 47" span	£9.95
AUSTER AIGLET 47" span	£8.15	FRECHDAX 43" span	£7.25
CESSNA 210 55" span	£18.95	SNOOPY 58" span	£15.50
PIPER TWIN COMANCHE 59" span	£23.85	BURDA PIPER 71" span	£22.95
LEAR JET	£38.00	T45 51¼" span	£19.25

see **SCHUCO** at
YOUR MODEL SHOP

LOST!

When the worst happens!

When your Aeromodel disappears into foliage or undergrowth, how do you find it? By having a Bleeper in your model and using a Bleeper Detector.

This tiny Transmitter fits with its PX 15 replaceable battery into a space 2" x 3/4" x 1 1/4", weighs (including battery) only 2 1/2 oz. (70 gm.) and transmits over a range of 25 ft. The signals are picked up on a palm-sized directional Receiver which operates on a PP3 battery. The PX 15 battery gives around 20 hours of Flying/Searching time.

Receiver and one Transmitter come to you (minus batteries) for £10 (including VAT - post paid UK).

Additional Transmitters are £3.50 (including VAT - post paid UK).

Receiver Battery 16p (including VAT) plus 5p packing and postage if ordered separately.

Transmitter Battery 60p (including VAT) plus 5p packing and postage if ordered separately.

Full Operating Instructions provided.

Available from Euronics Ltd., by sending cheque/PO for full amount.

EURONICS LIMITED,
EASTHOUSES INDUSTRIAL ESTATE,
DALKEITH, MIDLOTHIAN, SCOTLAND EH22 4DJ

KINDLY MENTION 'AEROMODELLER' WHEN REPLYING TO ADVERTISEMENTS

EURO-MODELS: EXCLUSIVE

P.O. BOX No. 6
Twickenham TW1 2JD

'AEROPICCOLA' NEW AERO
ENGINE STARTER

No more bad language,
chopped fingers, non-
starts, rebound jars,
grated knuckles.



Patented
coiled leaf
spring coupled to
overrun clutch
protection will start
ALL engines.

Light alloy and steel construction, requires **NO** batteries, **NO** maintenance. Just wind and start every time. Price £6.93 inc. VAT, price also includes Spinner Pins. Post paid U.K. only. Overseas: Rates on application.



CIPOLLA JUNIOR

the ideal
sports motor
- with plenty
of power!

Another outstanding engine from Italy! The CIPOLLA JUNIOR with a capacity of 1.49 c.c., is the ideal sport flyer's motor. It features robust construction, has more than adequate power, and uses conventional glow plugs.

Easy to start, easy to handle, the CIPOLLA JUNIOR makes a perfect beginner's engine. Also available in R/C form.

All spares in stock.

PRICES:
Standard R/C £7.45
£8.70

IRVINE ENGINES
31, The Fairway,
New Barnet,
Herts.

FOX STUNTERS

Control Line sport flying is essentially aerobic - naturally. Fox engines have led the Control Line stunt field for so long that we've lost count of the many, many such contest wins achieved with these motors.



FOX 15

Wt.: 4 oz.
Displ.: 2.5 c.c.

£4.16

R.P.M.: 12,000
With 8 x 4 Prop.

This little engine has been making friends for over ten years now. The ideal motor for A.P.S. Peacemaker, Jnr., Nobler, K.K. Spectre, etc. The latest model features an improved by-pass contour for quicker starting and an improved needle valve. The Fox 15 takes the A Size Fox Silencer.

The Fox 25 starts easily, runs smooth and will fly a much larger airplane than you would expect. It features a vertical intake stack similar to our Eagle 60 R/C motor. The Fox 25 has a bronze bushing and lapped meehanite piston. It takes the B Size Fox Silencer.

FOX 25 £4.92

Wt.: 6 oz. Displ.: 4.2 c.c. R.P.M.: 12,000 With 9 x 4 Prop.

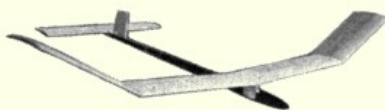
FOX 40 £7.19

Wt.: 9 oz. Displ.: 6.5 c.c. R.P.M.: 11,000 With 10 x 6 Prop.

Takes advantage of new 1973 stunt contest rules allowing light lines and 40 size motors. The Fox 40 Stunt has made many friends who report that they like the easy starting and the good steady run that it delivers. It has about 1,000 r.p.m. more than the famed Fox 35 Stunt. It features a bronze main, lapped meehanite piston and a streamlined by-pass. For muffling, a strap-on type must be used.

JOHN D. HAYTREE, Fox Manufacturing Co. (U.K.)
40 BUCKERIDGE AVENUE, TEIGNMOUTH, DEVON
Distributed by 'VERON' and IRVINE ENGINES

ST. LEONARDS MODEL SUPPLIES



ASTEROID

48" span A1 glider with contest performance.
£1.80 inc. p&p in UK
£2.20 overseas

NOVA

78" span A2 glider. Highest performing kit available.
£3.90 inc. p&p in UK
£4.40 overseas



SATELLITE

48" span A1 glider. Ultra simple for beginners.
£1.50 inc. p&p in UK
£1.90 overseas

Designed by JIM BAGULEY all kits have: Simple construction; Detailed Plan and Instructions; Die Cut Ribs; Coloured Tissue. Expert back-up advice if needed. Trade inquiries invited.

To: ST. LEONARDS MODEL SUPPLIES,
10 IVY CLOSE,
ST. LEONARDS, HANTS (Tel: Ringwood 5873)

Please supply details in enclosed SAE the following (delete as applicable):

Asteroid kits	@ £	=	£
Nova kits	@ £	=	£
Satellite kits	@ £	=	£

I enclose total

KINDLY MENTION 'AEROMODELLER' WHEN REPLYING TO ADVERTISEMENTS

CLASSIFIED ADVERTISEMENTS

All Classified Advertisements must be pre-paid.
 PRESS DATE for October issue, 1973, 23rd August 1973.
 Private and Trade rate 5p per word (minimum 60p). Box Numbers 25p extra. Display box rate £2.50 per single column inch.
 Box replies to be sent care of Advertising Department, P.O. Box 35, Bridge Street, Hemel Hempstead, Herts, England HP1 1EE. Copy received after first post on 23rd August will be held over until the next issue, unless cancelled in writing before 15th of the following month. There are no reimbursements for cancellations.

Who is BINDING?

Authorised agent for standard style binding of Aeromodeller and other Model & Allied Publications' Journals, to whom all loose copies of issues should be sent, is:

Beaumont Aviation Literature, 11 Bath St., London, E.C.1

Charge per volume (including index plus post and packing)
 Aero Modeller, Model Boats, Meccano (up to 1972) - £2.65.
 Model Railways, Military Modelling, Scale Models, Model Engineer - £2.75.

FOR SALE

E.D. Racer, Amco 3.5 P.B. ETA 29, Dooling 29, Lot £20. M. Antrobus. Tel. Chelford 405. G.

Two Mk. IV Oliver Tigers, Copeman £8, standard, £6, Merco 35, £4, all good condition. Douglas Allan, 3 Broomfield Drive, Dunfermline, Fife. G.

O.S. PET engine, unwanted present, £4, KK Phantom, £4, also rubber contest plans, 50p. Telephone 01-987 2311 after 6 p.m. G.

Super Merlin, £2, Cox Medallion 0.9, £4.50, two KSB Timers, engine cut-out D/T, £1 each. All unused. Relton, 103 Withersfield Road, Haverhill, Suffolk. G.

Olivers Mk. IV, £10, Mk. III, £5, T/R crutch and tank, £1, ETA 15, £4, Albon, £2.50, models lines and Rivers 3.5 bits. All o.n.o. 9 Wilson Road, Mirfield, Yorkshire. G.

Kosmic K-15D. Bench run, only £9. Jnr. Flite Streak, nearly completed, £3, 3 gallons castor diesel fuel, offers. 4 Orchard Croft, Harlow, Essex. G.

DC Spitfire 1 c.c., total running time, 2 hours plus pint fuel. Offers over £2.50. Tel. 01-730 1784. G.

Spark ignition and vintage diesels (especially multi-cylinder) wanted by keen collector - best prices paid - all types and countries. Contact: Peter Ross, 14 Blandford Close, London N2. Telephone 01-455 1963. T/C.

WANTED

Following issues of 'Aeromodeller', August 1943, April, July 1945, December 1948, May, December 1949, March, October 1950, September 1951, August 1953. Swops available 1950 to 1958. Hemmings, 94 Lea Vale Road, Oldswinford, Stourbridge, Worcestershire DY8 2AT. G.

AMERICAN AERO-MODELLING MAGS

R/C Modeller 50p
 M.A.N. 40p
 Flying Models 30p
 Scale Modeller 60p
 Current - and some back issues available from

THE AVIATION BOOKSHOP
 11 Bath Street, London E.C.1

BOB ASHBY

Secondhand Engine Specialist

All types of Motors bought and sold. Quotes by return.
 New M.V.V.S. D7 Diesels and G7 Glows £11 each; also New Tono 61 R/C Motors £12.
 S.A.E. for full list to:-
 99 Dark Lane, Batley, Yorks, WF17 7PW
 Tel. Batley 476709
 Please note: Closed Sept. 29th to Oct. 7th

TOP ALLOWANCE ON FISHING TACKLE AND PHOTOGRAPHIC EQUIPMENT TOWARDS ANY MODELLING GOODS MODEL ENGINES BOUGHT FOR CASH

ROLAND SCOTT LTD.

85 BOLTON ROAD, WALKDEN NEAR MANCHESTER

VINTAGE FLYING SCALE PLANS

Our 1/3" scale 1914 Albatros 2 seater won a 'VHC' certificate at the Northern Models Exhibition.

Super detail plan (2 sheets 24" x 16") 40p (U.S. \$2.00 Airmail) Aus., NZ 50p. We have the biggest and cheapest selection of reproduction vintage plans in the UK. 1937/9 Trailblazers from Flying Aces (kind permission of Henry Struck).

Deperdussin, Gunbus, JN4, 15p each (U.S. 50c), Aus., NZ 25p; Wright, Bleriot, Curtiss Pusher, Spad, Fokker D7, Douglas DWC Ryan, Taube, 20p each (U.S. 50c), Aus., NZ 30p; NC4 Flying Boat, Handley Page 0/400 25p each (U.S. 75c), Aus., NZ 40p; 1935 Megows 12/15" plans, Waco, Polish Fighter, Fokker Triplane, etc., 12 plans £1.00 (U.S. \$4.00), Aus., NZ £1.40; 1939 FROG plans (Courtesy A. A. Hales); 12" Hurricane, 12" Heston Phoenix 25p each (U.S. \$1.00), Aus., NZ 35p.

All Post paid. Foreign sent airmail. Many others. SAE for illustrated list.

C. TISSIMAN

8 Greystones Grange Crescent, Sheffield S11 7JL.

South Devon kits, accessories, engines and all building materials plus ready-to-fly helicopters and control line aircraft.

Agents for RipMax, KeilKraft, Veron, Fox, O.S., Davies Charlton, Solarfilm, R/C outfits and much, much more.

M A N S E L S

Torbay's premier model shop
 61 PALACE AVENUE, PAIGNTON
 Tel. 0803 59281

ELECTRIC R.T.P.

Pylon head plans and instructions for simple, reliable system, model plans, motors, props, wheels, cable and etc.

S.A.E. for list

HARRY BUTLER (Models)

P.O. Box No. 3

Brockenhurst, Hampshire, England. Telephone Brockenhurst 3034

The Advertisement Manager reserves the right to refuse or suspend advertisements without giving any reason. Every care is taken to avoid mistakes, but the publishers cannot be held liable in any way for clerical and printing errors or omissions. Receipt of 'copy' for publication implies acceptance of these conditions by the advertiser. Whilst every care is taken to exclude advertisements from doubtful sources, no responsibility can be accepted by the publishers for the bona fides of advertisers.

WOLVERHAMPTON MODELS & HOBBIES

Bell Street, Manders Centre,

Wolverhampton

Established 1957

Tel. Wolverhampton 26709

Try us for return postal service on all advertised Aeromodelling goods, or call and see us at the Town's largest Model Shop.

Representative to cover model, hobby and toy shops wanted. New manufacturer of model aircraft kits. Would suit someone who already covers them and seeks additional lines. Box No. 915, Aeromodeller Office, P. O. Box 35, Hemel Hempstead, Herts HP1 1EE. G.
 Wanted. Amco 3.5 BB diesel, old race cars - old engines, top price paid or exchange for U.S. equipment. H. A. Perez, 1104 Rutland Road, Brooklyn, N.Y. 11212, U.S.A. E.F.G.

TRADE

Superb ballpens, pencils, combs, diaries, brushes. Goldstamped with club or personal name. Raise funds quickly and easily. Samples/details from Northern Novelties, Bradford BD2 3AF. G.R.

R.S. & V. Engines buy all types of engines for cash. Send for best quotations by return. 646-648 High Road, North Finchley, London N12 0NL. T/C.

Blackpool, south: models, kits, accessories. Harrowside Model Supplies, 43a Harrowside, H.P. available. T/C.

Plans enlarged or reduced and additional copies made. Send for details from Causser & Co., 216 Goldhawk Road, London, W.12. Tel: 01-749 3441. T/C.

BOOKS

Flying Aces pre-war model magazines for sale. 30 copies 40p each. Grimes, 31 Hillcrest Road, Acton W3. Tel. 01-993 0447. G.

American Magazines by annual subscription. 'Flying Models' £3.15. 'Model Airplane News' £4.30. 'American Aircraft Modeller' £5.50. Send stamp for complete list. Willen (Dept. 1), Howard House, Howard Road, London E11 3PL. Tel: 01-556 7776. T/C.

Aeromodeller back issues mart, vast stocks of back issues held in stock. Beaumont, 11 Bath Street, London EC1. ALT/T/C.

SWANSEA

SWANSEA

SWANSEA

See Model Shop Directory

BUILD YOUR OWN HANG GLIDER

ROGALLO TYPE SAILWINGS

Plans £2.50 post free in U.K.

Kit available.

25p and S.A.E. for colour photo and details.

L. GABRIELS, 4 Thornlea Avenue, Hollinwood, Oldham, Lancs O18 3PX

KINDLY MENTION 'AEROMODELLER' WHEN REPLYING TO ADVERTISEMENTS

Plans of Oldie and Scale Models

F/F, gliders, R/C, rubber, C/L, etc.
Large and small
Send 6p in stamps for list and future additions.

Box No. 914 (London), Aeromodeller
Office, P.O. Box 35, Bridge Street,
Hemel Hempstead, Herts HP1 1EE

WHY NOT HAVE A GLIDING HOLIDAY THIS YEAR?

Weekly holiday courses at the Kent Gliding Club from £29 (exc. VAT). Write now for our full colour brochure to:
Kent Gliding Club, Challock, Ashford, Kent TN25 4DR.
Tel: Challock 307 or 274

5th NORTHERN AREA MODEL FLYING RALLY

at RAF ELVINGTON (7 miles S.E. of York) on Sunday, 2nd September 1973 at 10.0 a.m. Admission by programme (available at gate) 25p. 30 events including all Free Flight, Control Line and Fly for Fun Radio Control. SELBY trophy for F/F scale.

JUNIOR KIT CONTEST for any Rubber or Glider model under 50 in. wingspan built from a kit. Age limit 16 years on 2/9/73. 25p contest entry fee covers all events. Re-entry allowed in the F/F events. Evidence of third party insurance necessary before flying

GENEROUS PRIZES (£60-worth of STANLEY TOOLS and additional cash prizes).

ALL WELCOME. This is NOT an S.M.A.E. only event.

RAF ELVINGTON, N.A.M.F. RALLY
2nd SEPTEMBER 1973

AIR DISPLAY

Saturday, 29th September 1973

VETERAN/VINTAGE RALLY

Sunday, 30th September 1973

WYCOMBE AIR PARK
(Booker, Marlow, Bucks)

AIR DAY

Full Flying programme includes: Red Arrows, Nimrod, Helicopters, Parachuting, Gliding, Belfast, Hunter, Islander, Lightning, Sea Fury, Firefly.

V/V RALLY

Static display from 10 a.m. Over 600 V/V cars, buses, steam engines, fire engines, bicycles, Auto jumble, vehicle auction. Aircraft: Hurricane, Harvard, Lancaster, Swordfish, World War I Replicas and between-war aircraft.

Both Days

Gates 10 a.m. Flying Displays 2 p.m. Static displays, Restaurants, Bars, Old Time Fair. Spitfire, Rothmans Aerobatic Team, Hovercraft.

Admission (each day): £1.50 per car (includes all occupants); Pedestrians 50p; Children 20p; Coaches £8; Mini Coach £4.

CORNISH GLIDING AND FLYING CLUB

Gliding Courses in modern fleet from May - B.G.A. Categrised Instructors - fine soaring - lovely coastal airfield - Ideal for a different family holiday - Aerotow Courses available.

Details with pleasure from:

The Course Secretary
The Cornish Gliding and Flying Club
Trevellas Airfield, Perranporth, Cornwall
Phone: Devonan 862518

Take a holiday gliding course with the YORKSHIRE GLIDING CLUB

Fully residential Clubhouse with Licensed bar - full-time professional instructors - wave and hill soaring - modern fleet of gliders and tug aircraft - winch and aerotow launches - Falke motor Glider.
Book now for 1973 season April to September.

For brochure write to: The Secretary,
Yorkshire Gliding Club, Sutton Bank, Thirsk, Yorks. Tel. Sutton (Thirsk) 237

TOOLS, TOOLS, TOOLS

Model Master, Super quality specially selected for the Model Maker.

Micro drill sets:
Set 4X 4 drills, 0.3, 0.5, 0.7, 1mm dia. 65p
Set 4X 4 drills, 1.2, 1.5, 1.8, 2mm dia. 59p
Pintongs (double jaws) range zero to 1mm £1.45
Tweezers, fine angled points. For the specialist. Ref. 6CS17 £1.22
Tweezers, general purpose. Fine points. Ref. S17CS 68p

Precision needle files, single packs:
Available as general purpose or special fine for plastics, in the following forms: hand, round, knife, half-round, three-square, square & warding 23p each

Please include 10p to cover postage, packing and insurance.

DAILMERE ENGINEERING LTD.
10 High Street, Quinton, Birmingham 32
Please allow 10 days for delivery.

THE CHOICE OF CHAMPIONS

ETA



You can now only buy the famous ETA Range of engines direct from the factory. Used throughout the world, so we guarantee results!

SEND FOR LEAFLETS TODAY!

ETA Instruments Ltd.
289 High Street, Watford, Herts.
Tel: Watford 21725 or 23440


HENRY J. NICHOLLS AND SON LTD

308 HOLLOWAY ROAD LONDON N7 6NP
8 SOUTHGATE ROAD POTTERS BAR, HERTS
Tel.: 01-607 4272 Tel.: Potters Bar 59355

ESTABLISHED 1946

HI-START launching kit complete. Bungee line and Parachute on 12" spool. Highly recommended	£10.98
Tempo glider winch	£4.70
JAP SILK. White, yellow and red. Per yard	55p
PIRELLI RUBBER. New batch just arrived. 500 gms.	£2.75
U-REELY HANDLES. With 150ft. lines	£6.25
ROSSI 15 standard (limited supply)	£34.00
K & B 15 new model schnurle porting	£17.50
BARTELS PFOPS. 8 x 8; 7 x 7½; 7 x 3½	£1.10
FIREBALL PLUGS hot standard and cool. Per doz.	£3.50

MAIL ORDER: Our Mail Order Department will send any goods advertised by us anywhere in the world. All overseas mail orders are TAX FREE. OVERSEAS VISITORS ESPECIALLY WELCOME



MICHAEL'S MODELS

646-648 HIGH ROAD,
N. FINCHLEY,
LONDON N12 0NL

ENGINES NOW IN STOCK

Cox Tee Dee .010	£6.80	Taipan 2.5cc BB	£9.77
Cox Pee Wee .020	£3.66	Super Tigre G20/150	£9.90
Cox Babe Bee .049	£3.43	MVVS 2.5 D7	£13.95
Cox Tee Dee .049	£6.80	Super Tigre G15F.1.	£12.58
Cox Medallion .15	£8.75	Super Tigre G15/19F.1.	£12.58
Paw 1.49 DS	£5.50	Rossi Normale 15	£34.00
Paw 2.49 Mk. IV DS	£6.05	K & B .15 STD	£18.95
Paw 19-D DS	£6.60	Kosmic .15	£15.70

POSTAGE 10p PER ENGINE

EASY PARKING CLOSED ALL DAY MONDAY
MAIL ORDER A PLEASURE PHONE 01-445 6531
All inquiries must be accompanied by s.a.e.

Mattel's Superstar electric-powered plane	£9.00 post paid
An essential money-saving tool - balsa stripper	£1 post paid
Rossi 15 needles, Rossi 15 No. 2 head	75p post 5p
Rossi 15 speed c/w pipe £38.25	Rossi 15 N £34.00
Paxolin sheet 6" x 4" 1/16 & 3/32 28p; 1/8 36p post paid	
Rotary bellcrank 30p 3 post. Nylon wheels 1½" 23p p/paid	
Control Line speed calculator	56p post paid
Large Stunt Tank approx. 100 c.c.	70p post paid
D.I.Y. Mustard Tin tank	16p post paid
Day-glo strip orange and red	26p post paid
Warlord kit £2.80; Minilord £1.75 post paid	
Cox engine spares - try us first. TD049 head 66p post 4p	
Coloured nylon	43p yd. off roll plus post
P.A.W. & D.C. N.V.A.s	34p post paid
Plastic power pod-cum-tank	£1.75 post paid
16 s.w.g. thrust races	40p post 3p
Muticraft de luxe tool kit £5.22 p. 25p. No. 2 kit £1.76 p. 10p	
D.T. timers 5-min. £2.40 post 4p; 20 or 30 sec. fuel cut-off.	
Bobbins 3½p large; 2½p small plus post	
DT fuse 9p post 4p Fluorescent Nylon 3 yds. £1.50 p/paid	
Gambrinus free-flight pan drilled for ST 15 £3.10 p/paid	
ST needles 15p; spray bars 35p plus post	
Engines by Webra, D.C., Fox, HP, K&B, O.S., Enya.	
Kits by Keil, e.g. Aquarius, RipMax, Veron	
Send to: 6 CHATTERTON ROAD, BROMLEY, KENT	

AVIACRAFT LTD
01-460 0781

KINDLY MENTION 'AEROMODELLER' WHEN REPLYING TO ADVERTISEMENTS

ADDLESTONE Tel: 45440
Waybridge
ADDLESTONE MODELS LTD.
6 & 8 HIGH STREET
ADDLESTONE, SURREY
All leading makes of Kits, Engines, R/C
Gear and Accessories.
Second-hand R/C Gear.
Paybonds accepted.
Late night Friday 6.30 p.m.

ALDERSHOT Tel: 26825
CONCORDE MODELS
134 VICTORIA ROAD
R/C Models - All Accessories - Main-
stream and Merco Area Agents

AMERSHAM Tel: 4030
R.E.H. PHOTOGRAPHY
61 SYCAMORE ROAD, AMERSHAM,
BUCKS.
R/C equipment, aircraft and boat kits
and all modelling accessories.
Cameras taken in part exchange.

AUSTRALIA Tel: 347 8029
RIVERSIDE HOBBY CENTRE
16 LITTLE LATROBE STREET,
MELBOURNE 3000
Radio Control Equipment, Kits, Engines,
Accessories. M.A.P. Plans, Books.
FAST MAIL ORDER SERVICE

AUSTRALIA Tel: 497087
**SEMAPHORE HOBBY
CENTRE**
12 HART STREET,
SEMAPHORE SOUTH, S.A. 5019
M.A.P. Plans, Books, Kits, Engines,
Accessories, etc.
Radio Control Equipment
Free Price Lists

AUSTRALIA Tel: (02) 533 3517
SILVERTONE ELECTRONICS
UNIT 6 No. 2 SCHOFIELD STREET,
RIVERWOOD, N.S.W. 2210
Manufacturers of Silvertone R/C equipment,
including the Silvertone Mark VII propor-
tional system, Silvertone Keyboard Frequency
control, Silvertone Fallsafe package. We also
stock a complete range of R/C accessories.
Mail Order.

AYLESBURY Tel: 85752
**TAYLOR
& McKENNA**
46 FRIARS SQUARE

BARNSELY Tel: 6222
DON VALLEY SPORTS
28 DONCASTER ROAD, BARNSELY
Model Aircraft, Boats, Cars, Railways
All makes of Engines
R/C Equipment
Postal Service

BARNSTAPLE Tel: 3756
**GALES
OF BARNSTAPLE LTD.**
88 Boutport Street, Barnstaple, Devon
(Opposite Main Post Office)
Comprehensive range of kits and
accessories by most leading
manufacturers. Mail order.
Multi car park near by.

BEDFORD Tel: 59652
BRYAN SCALE MODELS
74 MIDLAND ROAD
Railways, Aircraft, Boats, Plastic Kits,
Books, Magazines, paints, etc.
Part-exchange, second-hand. Repairs.
Early closing Thursday. Easy parking

BIRMINGHAM Tel: 021-772 4917
BOB'S MODELS
520-522 COVENTRY ROAD
SMALL HEATH, BIRMINGHAM 10
MODEL CENTRE OF THE MIDLANDS
RADIO CONTROL SPECIALISTS
Friendly help and Advice backed by
over 20 years' experience

BIRMINGHAM Tel: 021-444 2369
KINGS HEATH MODELS
(Pearce's Newsagents)
8 YORK ROAD, KINGS HEATH
BIRMINGHAM 14
KeilKraft, Kits, Engines, Balsawood,
Paints, Airfix, etc.

BIRMINGHAM Tel: 021-554 5669
THE MODEL MECCA
204-206 WITTON ROAD,
BIRMINGHAM B6 6LB.
Kits, engines, accessories, R/C gear.
Balsa wood etc.

BIRMINGHAM Tel: 021-327 0872
**POWELL'S
MODEL CENTRE**
769 ALUM ROCK ROAD, WARD END
BIRMINGHAM 8
Personal attention of G. & F. Powell

BIRMINGHAM Tel: 021-373 5945
JIM DAVIS MODELS
332 MARSH LANE, ERDINGTON
BIRMINGHAM 23
We stock everything a modeller needs
to build and fly a Radio Control Aero-
plane, and advice

BIRMINGHAM Tel: 021-427 1653
THORNTON'S
Model Specialists
10-12 ALBERT WALK, HARBORNE
BIRMINGHAM
Veron, Keil, RipMax, Graupner Kits,
Radio Control Equipment, Boat Kits,
Model Railways, Racing Cars, etc.

BIRMINGHAM
TURNERS MODELDROME
NEWSAGENTS
24 TEVIOT GROVE, KINGS NORTON
Radio Control equipment, KeilKraft,
Veron, Airfix, Frog, RipMax, Engines,
etc.

BRADFORD Tel: 26186
MODELDROME
182 MANNINGHAM LANE
BRADFORD 8
Radio Control Equipment, Aircraft and
Boat Kits and all Modelling Accessories
Mail Order by return

BRIDGWATER Tel: 3632
JACK PALMER
36 ST. JOHN STREET
New to Bridgwater and the West.
We have a large range in stock. Air-
craft, boats, radios, engines and all
accessories.

BRIGHTON Tel: Brighton 418225
HARRY BROOKS
15A VICTORIA ROAD
PORTSLADE, SUSSEX
The best stocked model shop in the
South - You want it, we have it

BRISTOL Tel: 557764
JIM BENNETT MODELS
351 CHURCH ROAD, ST. GEORGE,
BRISTOL 5
The only Radio Control specialist in
Bristol. Kits by Veron, Keil, RipMax,
Concord, etc. We buy, sell, and part
exchange engines, airframes, boats,
radio control, etc. Paybonds accepted.

BRISTOL Tel: 47505
MODEL HIGHWAYS
85 GLOUCESTER ROAD, BRISTOL 7
Keil, Veron, Topflite
Fuel by the gal. Balsa, etc.
CLOSED WEDNESDAY

BURTON-ON-TRENT
Tel: 0283 64240
J. & N. MODELS
22 DERBY STREET, BURTON-ON-TRENT
Largest model stockist within 25 miles.
Kits and Accessories for Aircraft, Boats
and Railways, R/C equipment, Books,
Plastic Kits.
Easy parking - Paybonds Agents.

CAMBERLEY Tel: 27362
**MODEL WORLD
(CAMBERLEY) LTD.**
Mike Young & Nev Coombs, proprietors
75 HIGH STREET, CAMBERLEY, SURREY
Comprehensive stock of Kits, Engines,
Radio Control Equipment, Spares, etc.

KINDLY MENTION 'AEROMODELLER' WHEN REPLYING TO ADVERTISEMENTS

CARDIFF Tel: 29065
BUD MORGAN
 22-24 CASTLE ARCADE
 CARDIFF CF1 2BW
 K.K., Mercury, Veron kits, etc. RipMax, Futaba, McGregor, Simprop, Skyleader, Radio Control equipment. Merco, O.S. and all makes of engines. Paybond, Barclaycard and Access cards accepted.

CARDIFF Tel: 0222 22245
THE MODEL SHOP
 JOHN HALL LTD.
 22/24 MORGAN ARCADE
 Cardiff's leading Model Shop
 Aero and Marine kits, engines, R/C and accessories. RipMax, KeilKraft, Veron, Billings, M.F.A., Futaba, MacGregor, etc. Humbrol, books, profiles, plastic kits, sillicone tubing, etc.
 Credit terms.

CHICHESTER Tel: 83592
PLANET MODELS AND HANDICRAFTS
 108 THE HORNET, CHICHESTER, SUSSEX
 Aircraft and Boat Kits. All Accessories. Balsa Wood, Engines, Fuels, Finishes, etc. Model Railways & Racing Cars.
 Personal Service Mail Orders

COLCHESTER Tel: 45984
SATURN MODELS
 (Cliff Goater & Pete Giles, Prop.)
 20 SHORT WYRE STREET,
 COLCHESTER, ESSEX.
 ANGLIA'S NEW MODEL SHOP.
 SPECIALISTS IN RADIO CONTROL FOR AIRCRAFT AND BOATS.
 PROMPT MAIL ORDER SERVICE

DEVON Tel: 2685
THE MODEL SHOP
 56 FORE STREET, BRIGHAM
 Vast choice of Airfix, Frog and Revell Plastic kits and many at reduced prices. Full range of 'Humbrol' accessories. Headquarters Brixham Modelling Club.

DONCASTER Tel: 62524
B. CUTTRISS & SONS
 MODELS AND HANDICRAFTS
 40 DUKE STREET
 Call and see our Shop

DUDLEY Tel: 57045
ACE MODELS
 20 FOUNTAIN ARCADE, DUDLEY
 For KeilKraft, Veron, Mercury, Revell, Riko, Frog, etc.
 CLOSED WEDNESDAY

ESHER Tel: 01-941 0088
THE MODEL SHOP
 111 WALTON ROAD,
 EAST MOLESEY, SURREY
 Model Aircraft, boats, accessories

FAREHAM Tel: 4136
G. M. H. BUNCE & CO. LTD.
 206 WEST STREET, FAREHAM
 Aircraft, boats, engines, radio control Engineers/woodworkers tools and machinery

FARNWORTH Farnworth 74688 Tel: 74688
JOYCRAFT
 29 HALL LANE, MOSES GATE
 FARNWORTH, BOLTON
 The shop for all your modelling needs. Balsa Wood specialists, materials, engines, aircraft and boat kits. R/C equipment. S.A.E. for reply. Postal service. We are here to serve 'YOU'.

GATESHEAD Tel: 605545
THE WOOD SHOP
 (Models & Hobbies)
 2 TOWER COURT, DUNSTON,
 GATESHEAD, CO. DURHAM
 Veron, KeilKraft, RipMax, Graupner, Aurora, Frog, Balsa, Fuels, Dope. Personal attention by an active modeller.

GLASGOW 041-632 8326
RIDELL BROS.
 61 MOUNT ANNAN DRIVE
 (Facing Mount Florida School)
 GLASGOW S4
 VERON, KEIL, BILLINGS, AIRFIX, RIPMAX
 Accessories, Balsa, etc.

GRIMSBY Tel: 0472 2574
EVINGTONS
 5 ALEXANDRA ROAD, GRIMSBY
 Large stocks of Radio Control equipment, engines, kits, etc. Hire purchase, Paybonds and Access accepted. Your spare equipment sold.
 Closed Thursday, Car Park 39 yards.

HARLOW Tel: 20213
 At last, a specialist modelling shop at
ROD'S CYCLES & TOYS
 109 THE STOW, HARLOW, ESSEX
 KeilKraft, RipMax, Solarbo Balsa, Engines, Fuel, Solarfilm, Billings Boats, Airfix, Tamiya, Pyro, Aurora, etc.
 Early closing Wed. Open Sun. morning

HAVERFORDWEST Tel: 3175
MODEL CRAFT
 15 CARTLETT,
 HAVERFORDWEST, PEMS.
 At last a specialist model shop in West Wales. All popular makes always in stock. Mail order? Certainly. S.A.E. for lists please. R/C accessories, Aircraft and Boat Kits, etc.

HEMEL HEMPSTEAD
 Tel: 53691
TAYLOR
 & McKENNA
 203 MARLOWES

HIGH WYCOMBE Tel: 30741
KEENS MODEL SHOP
 28 THE ARCADE (Upstairs)
 TOWN CENTRE
 The complete modern shop. Aircraft, boats, cars, railways, radio control. All spares, bits and pieces. Plus 26 yards of How To Do It.
 Paybonds, Barclaycard, Mail Order

HODDESDON Tel: 60000
KEITH'S MODEL CENTRE
 3 BURFORD ST., HODDESDON, HERTS.
 Nr. Clock Tower. Car Park close by.
 Model boats, cars, aircraft & AFV kits, wide range of Model Railways, Minitanks, Bellona and accessories.
 ALL ASPECTS OF AEROMODELLING, prompt attention to your inquiries.

HONG KONG Tel: K-680507
RADAR CO. LTD.
 2 OBSERVATORY ROAD
 TSIMSHATSUI, KOWLOON
 The most complete stock in the Far East. Agents for Veron, Solarbo, Keil Kraft, M.K. Pilot, Sole Agents for Graupner, O.S. Prompt mail order service.

HORSHAM Tel: 61533
MODEL CORNER
 30 NORTH STREET, HORSHAM, SUSSEX
 Comprehensive range of Kits. Veron, Keil, etc. P. & P. extra. Overseas inquiries invited.

HUNTINGDON Tel: 0480 3328
HUNTS ANGLING & SPORTS (MODELS)
 18/19 HIGH STREET, HUNTINGDON
 Everything for the Modeller, Kits, Engines, Parts, Materials, R/C equipment. Specialist Engineers. Postal services. Open 9-6 Mons/Sats. 5 minutes A1.

ILFORD Tel: 01-554 9142
AVIACOLOUR
 MODEL SUPPLY SPECIALISTS
 Specialists in Radio Control
 466 EASTERN AVENUE, ILFORD, ESSEX
 (1 min. from Gants Hill Central Line tube station)

IPSWICH Tel: 51195
BOWMANS OF IPSWICH
 37/39 UPPER ORWELL STREET, IP4 1HL
 The RIPMAX Model and Radio Centre
 Aircraft - Boats - Cars - Accessories
 All leading makes
 World Wide Mail Order Service

IPSWICH Tel: 57106
R. & D. MODELS LTD.
 25 NORWICH ROAD, IPSWICH,
 SUFFOLK IP1 2NG
 For radio - kits - engines - aircraft - boats - cars - and specialist items.
 THE MODELLERS' MODEL SHOP

KINDLY MENTION 'AEROMODELLER' WHEN REPLYING TO ADVERTISEMENTS

KENT Tel: Ash Green 872136

THE HOBBY HOUSE
 10 UPPER STREET NORTH,
 NEW ASH GREEN, Nr. DARTFORD
 Aeropiccola, Steingraeber, K.K., Airfix,
 Riko, Farish, Peco, etc.
 Barclaycard Easy parking
 Closed all day Monday Mail Order

KINGSTON Tel: 01-546 4488

MICK CHARLES MODELS
 World R/C Scale Champion 1970/71
 124 CANBURY PARK ROAD,
 KINGSTON-UPON-THAMES, SURREY
 All leading makes stocked
 Personal service, Mail Order.
 Open: 9-6.30, Friday till 9 p.m., Sat, till
 7.30 p.m. Wed. Close 1 p.m.

LEEDS Tel: 646117

FLYING MODELS
 R. E. SHERWOOD,
 NEWSAGENT,
 88 CROSSGATES ROAD, LEEDS 15
 Everything for the Aeromodeller. Come
 to see our shop and park in comfort.

LEEDS Tel: 645321

IAN G. HILL
 6 CHURCH LANE, CROSSGATES,
 LEEDS LS15 8BD
 Kits: Tamiya, Heller, Airfix, Lindbergh,
 etc. Figures: Hinchliffe, Almark, Jack-
 boot, S.E.G.O.M., etc. Publications:
 Almark, Arms & Armour, etc.
 FULL MAIL ORDER SERVICE

LEEDS Tel: 27891

THE MODEL SHOP
 38 MERRION STREET
 (Nr. Tower Cinema)
 Model aircraft—boats—cars—railways,
 all makes engine. Every accessory,
 R/C equipment. Same day postal service

LEICESTER Tel: Leicester 21935

**RADIO CONTROL
 SUPPLIES**
 52 LONDON ROAD
 Mail Order Specialists
 Closed Monday
 Open until 8.30 p.m. Friday
 The Showroom of the Midlands with full
 R/C service facilities

LINCOLN Tel: 25907

MODEL CENTRE
 24 NEWLAND
 THE ENTHUSIAST'S SHOP
 Big Stocks of Kits, Engines, Balsa,
 Accessories, R/C Gear, etc.
 MAIL ORDER

LONDON Tel: 01-542 3062

**MODEL AND TOOL
 SUPPLIES**
 604 KINGSTON ROAD,
 RAYNES PARK, S.W.20
 Aircraft and Boat Kits, engines and
 R/C equipment. All leading makes.

LONDON Tel: 01-520 4565

BRIDGE MODELS
 1/2 STATION PARADE,
 HOE STREET BRIDGE
 WALTHAMSTOW, LONDON E.17
 LARGEST SELECTION OF KITS IN
 LONDON

LONDON Tel: 01-228 6319

E. F. RUSS
 101 BATTERSEA RISE, LONDON S.W.11
 Plastic Kits, Model Boats, Aircraft and
 accessories. All leading makes in stock.
 Friday open until 7 p.m.
 Early closing Wednesday

LONDON Tel: 01-560 0473

**RADIO CONTROL
 SUPPLIES**
 581 LONDON RD., ISLEWORTH, MIDDX.
 Mail Order Specialists
 Open each weekday and until
 8.30 p.m. Fridays
 Largest R/C stockists in the country
 Own R/C service centre

LONDON Tel: 01-788 6497

J. & D's HOBBIES
 118A UPPER RICHMOND ROAD
 Nr. East Putney Tube Station
 Closed Thursday
 Open until 7 p.m. Friday

LONDON Tel: 01-959 2877

**H. A. BLUNT
 & SONS LTD.**
 MILL HILL CIRCUS, LONDON N.W.7
 Complete range of model aircraft,
 engines and accessories, boats,
 cars and railways

LONDON Tel: 01-472 2471

**A. G. HERMITE
 (MODEL SUPPLIES)**
 633 BARKING ROAD, WEST HAM, E.13
 Aircraft—Boat—Car—Plastic Kits & R/C
 Saturdays 9 a.m. to 6 p.m.
 Postal Service

LONDON Tel: 01-485 1818

AERO NAUTICAL MODELS
 39 PARKWAY, CAMDEN TOWN, N.W.1
 Main Agents for RIPMAX GRAUPNER
 Full range of Timbers stocked and cut
 ALL KITS AND ACCESSORIES FOR
 AIRCRAFT AND BOATS
 MAIL ORDER SERVICE
 min. from Camden Town Tube Station,
 Northern Line.
 LONDON'S LEADING MODEL SHOP

LONDON Tel: 01-852 2637

LEWISHAM MODEL CENTRE
 45 LEE HIGH ROAD, LEWISHAM, S.E.13
 A good selection of KellKraft, Veron,
 Graupner, TopFlite, Gillons, etc., always in
 stock. All types of Engines, Accessories and
 Spares; also single and multi R/C equipment.
 Late night Friday. Mail Order a pleasure.
 Paybonds and Barclaycards accepted.

LONDON Tel: 01-852 2637

W. & H. (MODELS) LTD.
 14 NEW CAVENDISH STREET, W.1
 (Five minutes from Oxford Circus)
 LEADING WEST-END STOCKISTS OF
 ALL QUALITY MODEL AIRCRAFT KITS,
 BOATS, RAILWAYS, MAIL ORDER

LONDON Tel: 01-607 4272

**HENRY J. NICHOLLS
 & SON LTD.**
 308 HOLLOWAY ROAD, N.7
 We stock only the best for
 AEROMODELLERS
 Specialists in Radio Control

LONDON Tel: 01-703 4562

**MODEL AIRCRAFT
 SUPPLIES LTD.**
 207 CAMBERWELL ROAD, S.E.5
 Business Hours:
 Monday to Wednesday, 10 a.m. to 6 p.m.
 Saturday 10 a.m. to 5 p.m.
 Late night Fri. 7.30 p.m. Closed all day Thur.
 Postal Service. Parking Facilities

LONDON Tel: 01-445 6531

MICHAEL'S MODELS
 646-8 HIGH ROAD, N. FINCHLEY, N.12
 Comprehensive stock of KeilKraft, Mer-
 cury & Veron kits. Good selection of
 engines and a full range of accessories
 and woods. Specialists in second-hand
 engines.
 MAIL ORDER A PLEASURE
 Closed all day Monday Easy parking

LONDON Tel: 01-850 4324

ELTHAM MODELS
 Ian and Ray Stilling
 54 Well Hall Road, Eltham, London S.E.9
 The Model Shop with the friendly
 atmosphere.
 Full range of Aircraft & Boat Kits.
 Engines, Balsa, Dope, etc.

LONDON Tel: 01-985 7952

WILRO MODELS LTD.
 22 CLARENCE ROAD, CLAPTON, E.5
 Hackney's Model Shop. Aircraft & Boat
 Kits, Radio Control & Accessories,
 KeilKraft, Mercury, Veron, Simples,
 Aerokits, Billings boat kits.
 Paybonds accepted.

LUTON Tel: 23182

AEROMODELS (LUTON)
 20 GORDON STREET,
 LUTON, BEDS.
 Model Aircraft, Cars, Railways and
 Boats for the beginner and expert.

MAIDSTONE Tel: 51719

J. F. CARTER & SONS LTD.
 (THE MODEL SHOP)
 19-23 UPPER STONE STREET
 MAIDSTONE, KENT
 Complete range of modelling equipment
 and accessories, including R/C.
 MAIL ORDER

KINDLY MENTION 'AEROMODELLER' WHEN REPLYING TO ADVERTISEMENTS

MANSFIELD Tel: 25808
MANSFIELD MODEL SHOP
9 TOOTHILL LANE,
MANSFIELD, NOTTS.
Open 9.30 to 6.00
Closed Wednesday all day
Easy parking
The Aeromodeller's Model Shop

MIDDLESBROUGH
MODELDROME
265 LINTHORPE ROAD,
MIDDLESBROUGH, TESSIDE
Tel: Saltwells 3212
Radio Control Equipment, Aircraft and
Boat Kits and all Modelling Accessories
Mail Order by Return

MINEHEAD Tel: Minehead 3423
Minehead Sports & Toys
(A. & J. Holman)
45 & 55 THE AVENUE, MINEHEAD
Model stockists, Aircraft, Boats, most
leading makes, Kits, Engines and model
accessories, Radio for the beginner and
the expert.

NEWCASTLE Established 1924
THE MODEL SHOP
(NEWCASTLE UPON TYNE) LTD.
18 BLENHEIM STREET Tel: 22016
NEWCASTLE UPON TYNE, ENGLAND
Pioneers of modelling
Our Expert Staff are at your service
MAIL ORDER

NORTHAMPTON Tel: 31223
THE MODEL SHOP
(Super Model Aircraft Supplies)
230 WELLINGBOROUGH ROAD,
NORTHAMPTON
Established 1937
Full range of model supplies, Swan,
RipMax, MacGregor and Futaba Digital.

NOTTINGHAM Tel: 50273
GEE DEE LIMITED
40 GOOSE GATE
NOTTINGHAM
Everything for the aeromodeller at
Nottingham's leading shop.

NOTTINGHAM Tel: 281903
PEGASUS MODELS
171 BRAMCOTE LANE,
WOLLATON,
NOTTINGHAM
Closed Wednesday

OLDHAM
THE HOBBY LOBBY
10 WATERLOO STREET, OLDHAM
(Off Union St. Near A.B.C. Cinema)
Aircraft and Boat Kits, Engines, Model
Accessories, Secondhand Model Rail-
way. Everything for the Modeller. Part
Exchange Welcome.

OXFORD Tel: 42407
HOWES MODEL SHOP
9-10 BROAD STREET, OXFORD
RipMax, KeilKraft, Veron, Graupner,
Aerokits, Billing, Enya, Veco, O.S.,
H.P., Micro-Mold, Cox, Scorpion fuel,
R/C gear. Mail Order by return.
Paybonds accepted.

PLYMOUTH Tel: 21851
**PLYMOUTH
MODEL CENTRE**
11 OLD TOWN STREET,
PLYMOUTH PL1 1DA
The 100% model shop for the
South West

POOLE Tel: 3300
SETCHFIELDS
21-25 HIGH STREET
For all Models including Rio and
Solido

POTTERS BAR Tel: 59355
HERTS.
HENRY J. NICHOLLS & SON LTD.
8 SOUTHGATE ROAD,
POTTERS BAR, HERTS.
Try the Hertfordshire Department of
the well-known hobby shop for all
your modelling needs.

READING Tel: Reading 51658
**READING
MODEL SUPPLIES**
5 CHATHAM STREET, CAR PARK
OXFORD ROAD, READING, BERKS.
BERKSHIRE'S SPECIALIST MODEL
SHOP FOR KITS, ACCESSORIES,
ENGINES, RADIO EQUIPMENT.
H.P. Terms available.
You can drive right to us.

READING Tel: 50074
G. SLEEP LTD.
22/24 KINGS ROAD, READING
For over 30 years we have had one of
the largest Model Stocks in the
South of England.

ROMFORD Tel: ROM 44508
HOME & HOBBY STORES
144 NORTH STREET, ROMFORD, ESSEX
We stock all that's best in modelling.
Kits, engines, radio. Part exchange.
Mail order by return. Paybonds agents.
Open 7 p.m. Fridays
No parking problems.

SHEFFIELD Tel: 581197
SHEFFIELD HOBBIES CENTRE
141 LONDON ROAD, SHEFFIELD
Main agents for Sprengbrock, Swan, Futaba,
Wairon, MacGregor, etc. Service facilities
for all makes equipment. Vast range of kits,
engines, accessories for planes, boats, cars.
A veritable Aladdin's Cave of modelling
treasures, 24 hrs. Mail Order service.
Credit facilities. Open Mon.-Sat. 6 days.

SOLIHULL Tel: 021-744 3374
SHIRLEY MODEL SUPPLIES
62 STRATFORD ROAD,
SHIRLEY
Triang, Scalextric, Airfix, Balsa Kits,
etc. Personal attention and advice to
young modellers.

SOUTHAMPTON Tel: 0703-25565
R.G.L. MODEL SHOP
R. G. LEWIS (SOTON) LTD.,
17 HANOVER BLDGS., SOUTHAMPTON
Specialist in
BOATS - CARS - AIRCRAFT
RADIO CONTROL EQUIPMENT

SOUTHAMPTON Tel: 25919
HOBBY LOBBY LTD.
52 COMMERCIAL ROAD
CALL - WRITE - OR PHONE
Paybonds accepted
Open: Monday to Friday 9 a.m.-6 p.m.
Saturday 9 a.m.-5.30 p.m.

STAFFORD Tel: 3420
Everything for the Modeller at:
JOHN W. BAGNALL LTD.
SALTER STREET, STAFFORD
Multi and Single R/C, Kits, Engines,
etc. Paybonds welcome, special cash
prices for Radio. By return Mail Order.
Closed all day Wednesday.

STAMFORD Tel: 4524
SPORTS & HOBBIES
4 ALL SAINTS STREET, STAMFORD
LINCS.
Stockists for: Keil, RipMax, Micro-Mold,
Veron Kits and accessories. Comprehen-
sive range of engines and radio control
equipment. Model railway and angling
supplies. Mail Order Service.

STOCKPORT Tel: STO 5478
THE MODEL SHOP
280 WELLINGTON ROAD SOUTH
(BRAMHALL LANE CORNER)
Aircraft, Boats, R/C Equipment, Engines,
Railways, Car/Racing, Plastic Kits
Postal Service.

SUTTON Tel: 01-330 2964
RADIO CONTROL HOBBIES
243 CHEAM COMMON ROAD
Worcester Park, Nr. Sutton, Surrey
We are well worth a visit. Agents for
KeilKraft, Veron, etc. With accessories
to back up.

SWANSEA Tel: 52877
**SWANSEA MODELS
& HOBBIES**
11 SHOPPERS WALK, OXFORD STREET,
SWANSEA
Beginners and experts welcome. We have
huge stocks of kits, materials and acces-
sories, engines, electric motors and radio
control. Plus all the help that we can give.

KINDLY MENTION 'AEROMODELLER' WHEN REPLYING TO ADVERTISEMENTS

SWINDON Tel: 26878

J. & M. MODELS
2 CIVIC CENTRE,
SWINDON

Comprehensive range of goods to suit
all Aeromodellers

WALSALL Tel: 23382

S. H. GRAINGER & CO.
CALDMORE MODELS
108 CALDMORE ROAD

Everything for the Modeller
Aircraft - Railways - Boats - Electric
Cars - Repairs - Overhauls - Spares -
Radio Control - Part Exchanges - Pay-
bonds accepted.

WOLVERHAMPTON Tel: 26709

MODELS & HOBBIES
BELL STREET, MANDERS CENTRE,
WOLVERHAMPTON

EXPERTS COME TO US
VISIT US AS WELL
WE HAVE ALL THE BEST IN MODELLING

TUNBRIDGE WELLS Tel: 31803

TELESERVICE
108 CAMDEN ROAD

Kits, Engines, Accessories, R/C Gear,
Balsa Wood etc.
Also Radio and Electronic components.

WATFORD Tel: Watford 43026

MODEL EXCHANGE
71 ST. ALBANS ROAD,
WATFORD, HERTFORDSHIRE

The shop with stock and expert advice.
Free radio and engine testing service.
S/H engines and radio bought and sold
any time. 'Performance spoken here'

WORCESTER Tel: 0905-26897

R.G.L. MODEL SHOP
(R. G. Lewis Ltd.)
6 FOREGATE STREET

Specialist in
BOATS - CARS - AIRCRAFT
RADIO CONTROL EQUIPMENT

WALKDEN Tel: 061-790 6707
061-890 3030

ROLAND SCOTT LTD.
85 BOLTON ROAD, WALKDEN,
Nr. MANCHESTER, LANCS.

Save time - try us first for most items
advertised in the 'Aeromodeller'. Pay-
bonds - Barclaycards, etc. accepted.
Send stamps for second-hand lists

WELWYN

**H. A. BLUNT
SONS LTD.**
38 FRETHERNE ROAD,
WELWYN GARDEN CITY, HERTS.

Complete range of model aircraft,
engines and accessories, boats, cars
and railways.

WORKSOP Tel: 2855

MODEL CENTRE
RYTON STREET

Main agencies for all Kits, Engines and
Radio Control equipment.
Mail Order Service.

WALSALL Tel: 23984

AEROMODELS (WALSALL)
123 Wolverhampton Street,
Walsall, Staffs.

Plastic kit specialists and flying kits by
Keil, Veron, etc. Boats, engines and all
accessories.

WIGAN Tel: 83208

TONY'S MODEL CENTRE
10 CHAPEL STREET,
PEMBERTON, WIGAN

Radio Control equipment, Aircraft, Rail and
Boat Kits and all your modelling require-
ments. Personal attention assured.
IT WILL PAY YOU TO VISIT US
Easy parking
MAIL ORDER SPECIALISTS


YEOVIL Tel: 21083

THE DIGI HANGAR
79 PRINCES STREET, YEOVIL,
SOMERSET

THE NEW MODEL SHOP FOR THE
SOUTH-WEST. FOR RADIO, ENGINES
AND KITS - AIRCRAFT AND BOATS

AN I.P.M.S. HOBBY PUBLICATION

**Scale
Plastic Kits
of the World
1973** 75p



**The
complete
directory**

Aircraft . Boats
Sailing Vessels
Cars . AFVs
Motorcycles
Space Models

Every plastic model kit ever made by 196 manufac-
turers in seventeen different nations around the world!
Prepared and checked with the co-operation of I.P.M.S.

All coded to manufacturer and scale. Price 75p.

MODEL & ALLIED PUBLICATIONS
Box No. 35, Bridge Street, Hemel Hempstead,
Herts HP1 1EE

**DIESEL and GLOPLUG
AERO ENGINES**

**look!
low prices**

DC Wasp 0.8cc ...	£2.38
DC Merlin 0.76cc ...	£3.18
DC Spitfire 1cc ...	£3.78
DC Sabre 1.5c ...	£4.00
OS20 R/C ...	£9.43
Frog 2.49 ...	£5.81
Frog 3.49 ...	£5.89
P.A.W. 1.49 DS ...	£5.00
P.A.W. 2.49 DS ...	£5.51
P.A.W. 19 DS ...	£6.00
Veco 61 ...	£25.41
ED Fury R/C ...	£5.76
Fox 25 R/C ...	£6.85
Fox 40 R/C ...	£9.00
Webra 61 R/C 10cc ...	£33.00

Many more Aero and Marine.
New Zealand orders welcome.
Send 7½p P.O. for Lists
Duty Free - Export only

THE MODEL SHOP (Guernsey)
No. 1, Commercial Arcade, Guernsey, C.I.

SCOTTISH MODELLERS

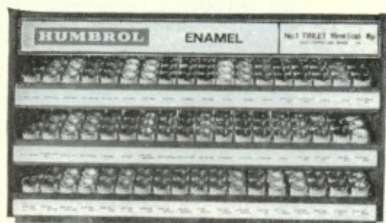
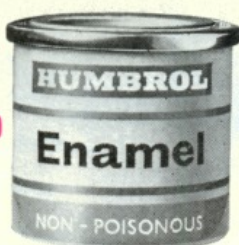
Try our Mail Order Service

We aim to keep a comprehensive
stock of all modelling requirements

DUNNS OF PERTH
29 SCOTT STREET, PERTH, SCOTLAND
Tel: 24540

KINDLY MENTION 'AEROMODELLER' WHEN REPLYING TO ADVERTISEMENTS

HUMBROL
Enamel
Still only 8p
for 15ml.



**LOOK FOR THE HUMBROL
PAINT LOCKER - NOW!**

Skill, patience and Humbrol Authentic...

A true match for any model. Formulated after careful research to give the nearest possible reproduction to the real thing, Humbrol "Authentic" colours bring true "authenticity" to your models.

This Junkers Ju 87B Stuka dive bomber, one of the most frightening weapons used by the Germans in World War II is given that realistic finishing touch with Humbrol "Authentic".

Bring your model to life with Humbrol "Authentic"—they're not only the right colour—they're non-toxic and the right price too—real value for money.

Ask for Humbrol by name . . . available from all leading Model and Toy shops.

Humbrol will be pleased to send you—FREE—colour cards and leaflets. Write to Mr. W. H. Stewart, Product Manager, Dept. 12, Modelling Division, Humbrol Limited, Marfleet, Hull.



HUMBROL

STOP PRESS · Humbrol · still the finest quality & real value for money!

KEILKRAFT

Controliners



MARQUIS

A very fine-looking stunt model with attractive semi-scale lines, featuring tricycle undercarriage and extra large cockpit. For 1 to 1.5 c.c. engines. Wingspan 30".

£3.14



FIREFLY

Stunt model with 'profile' type fuselage. Specially designed for engines under 1 c.c. Kit contains die-cut parts. Wingspan 20".

£1.62



TALON

Combat design of considerable strength. Easy and quick to build. A fully-aerobatic model that is great fun to fly. For 2.5 to 3.5 c.c. engines. Wingspan 32".

£2.48



DEMON

A racy control line model for engines up to 2.5 c.c. Kit contains die-cut parts. Wingspan 30".

£2.95



RADIAN stunt model

with coupled wing flaps and elevators
The latest thing in small stunt control-liners for 049 motors. Kit contents include die-cut parts, stunt tank, preformed U/C, formed canopy, all hardware, full-size plan and instructions. 22" wingspan.

£1.71



SPECTRE

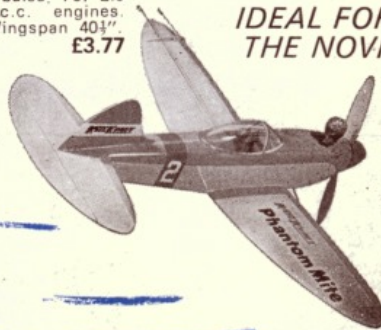
Outstanding stunt model featuring combined wing flap and elevator control. Wing ribs, formers, etc., die-cut in highest quality balsa. For 2.5 to 3.5 c.c. engines. Wingspan 40".

£3.77

PHANTOM MITE

The Phantom Mite is just about the toughest model available to the newcomer to control line flying. Features all-sheet construction with wings, tailplane, fin and fuselage sides ready cut to shape, for 5 to 8 c.c. Wingspan 16".

£1.34



IDEAL FOR
THE NOVICE

KEILKRAFT

HANDBOOK

90 pages of Aero-modelling knowhow with details of kits and accessories.

20p from your model shop or direct from:
E. KEIL & CO. LTD.
WICKFORD, ESSEX
SS11 8BU
20p + 5½p postage

FOR TOP PERFORMANCE