

Aero modeller

AUGUST 1981 60p

(U.S.A. & Canada \$2.75)



MODEL
MAGAZINE

**FREE
FLIGHT NATS**

**MAIKIS
INDIGO
STUNTER
DESIGN**



Veron - BUY AND FLY THE BEST!

FEATURED FAVOURITES FOR FLYING!

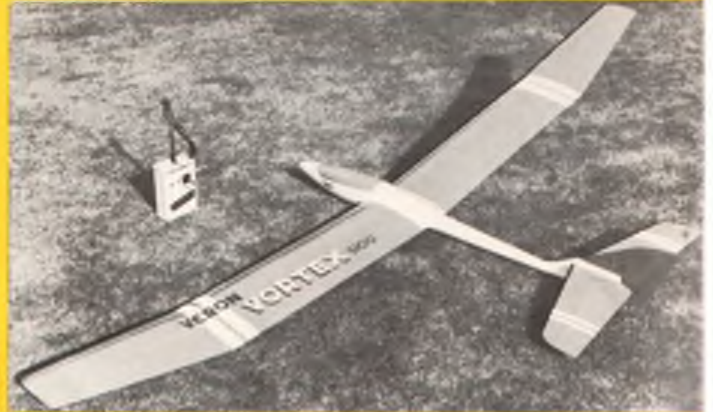
ALL TOP RATERS IN THE POPULARITY STAKES!

TIGER MOTH

50" SPAN — 127 cms — 1/7th Scale
FOR 3-CHANNEL PROPO RADIO

THE WORLD'S MOST FAMOUS AIRCRAFT IN MODEL FORM!
THE LATEST IN OUR RANGE OF CLASSIC SCALE VINTAGE.

Superlative kitting for this "Almost-true-to-scale" beauty with A.B.S. Cowl and all top coamings in vacuum-formed plastic! VERON's usual complete kitting — wheels, spinner, decals, tank and all pre-bent wire strutting. A host of bits and pieces to complete! **£46.95**



VORTEX

"1005" OR OPEN-CLASS SOARER
99% Span — 252 cms.

£49.50

Incorporating all the best and proven features in Continental design — 2-piece White-gel Fuselage (Pod and Boom) — Low drag thin profile wing section for both penetration and light loading in all variable conditions. For 2-Channel Radio (ample room for 3!).



FOKKER D.8.

46" (117 cm) Span
For 1 or 2 Channel

"Very-near-to-scale" Vintage WW1 Single Seat Fighter. For 1.5 up to 2.5 cc (0.09 cu. in. to 0.15) on either 1 or 2 Channel Radio. Vacuum-formed Cowl Vintage Wheels, Decals. **£29.95**



Sopwith STRUTTER

48" 122 cms

For 2.5 to 3.5 cc (0.15 to 0.19 cu. in.) with 2 Channel on Rudder and Elevator (optional 3 on Motor). Kit has Vacuum-formed Cowl. All pre-formed wire strutting etc. As steady as a rock to fly! Vinyl Decals. **£39.95**



Hawker TOMTIT

52" Span
132 cms

Scale for Full-House 4 Propo Radio! Motors of 0.23 up to 0.40 cu. ins. (3.7 to 5.6 cc). Scale cylinders, Vinyl Decals, Vintage Wheels — all included! This model has been used in several Club Circuses! **£49.75**



BIG IMPALA

74" Span 188 cms.
For 2 Channel

A classically stretched version of the world-renowned Impala! A.B.S. Plastic ribs and formers. Can be built also for 3 Channel with ailerons — an extra wing kit is available. Detachable nose. **£28.95**

QUB AGENT IN AUSTRALIA IS:
DAWN TRADING, 17 TENDERDEN ROAD,
BOTANY, NEW SOUTH WALES 2019.



SKYLANE

54" Span 137 cms.
For 2 or 3 Channel

This is so stable that it makes a good "first" for Radio. For 2 cc up to 3.5 cc. Tough and durable — built like a gate! **£34.75**



ROBOT

45" Span 115 cms.
For 2 or 3 Channel

The first-acclaimed Radio Trainer — and still the Best! For 1.49 to 2.49 — even 3.5 with 3 Channel. Tough Dural undercart. Foam wing available. **£25.95**

MODEL AIRCRAFT (Bournemouth) Ltd.,
Norwood Place, Pokesdown, Bournemouth.

AVAILABLE FROM YOUR DEALER

Veron

PRODUCERS OF QUALITY
KITS FOR OVER 45 YEARS

Aero modeller

AUGUST 1981

Editorial Director **TONY DOWDESWELL**
EDITOR **COLIN RATTRAY**
Graphics **LORNA CULLEN**

MAP **MODEL DIVISION MAGAZINE**

Advertisement Director **M. GRAY**
Managing Director **RON MOULTON**

Comment

Since I have been in the chair as Editor of *Aeromodeller*, my conception and appreciation of the hobby has changed considerably. For me, aeromodelling has perhaps represented a rather romantic element, seeing one's own creation take to the air has always been a magical experience.

This feeling tends to get diluted some-

what as one's technical knowledge increases, and perhaps also with the political wrangling of various aspects.

This last weekend my initial feelings for the hobby were given a considerable uplift. Standing on the field of Old Warden (Scale Day) it was refreshing to be surrounded by modellers with a gleam in their eyes, as they launched models left, right and centre, talking at length on each aspect of the flight and of course repairing the damage. If one asked "how much does it weigh?" A shrug would be given and the answer: "I don't

know, I just built it as light as I could and it flies OK." All this shows that it takes all types and how varied the pleasures are in modelling.

It seems a shame though that the general modeller tends to leave all the news and the writing of articles to the dedicated competition flyer. Is it not time that you voiced your own opinion to the staff of *Aeromodeller*? After all the magazine can only publish the material and comments it receives from you, the modeller.

Editor

Contents

© Model & Allied Publications Ltd., 1981 ISSN 0001 9232

Volume 46 Issue No. 547

- 400 HANGAR DOORS
- 401 AEROMODELLER COMPETITION
- 402 FREE FLIGHT NATIONALS
- 407 TOPICAL TWISTS
- 408 GETTING TO GRIPS WITH GLOW PLUGS
- 410 VINTAGE CORNER
- 413 LITTLE WILLIE — CO₂ FREE FLIGHT MODEL
- 416 INDIGO — CONTROL LINE STUNT MODEL
- 418 ENGINE NEWS
- 420 SCALE MATTERS
- 422 R/C SPORT FLYER
- 424 FROM THE HANDLE
- 428 CO₂ DEVELOPMENTS

- 432 CLUB NEWS
- 433 CAPTION CONTEST
- 434 SHOP GUIDE
- 437 CLASSIFIED ADVERTISEMENTS

On the Cover

This month's cover picture was taken late in the day as the wind and rain swept F.F. Nationals. Apparently unaffected by the bad weather are the three FAI winners. Left to right John Bailey, Mike Fantham and Dave Greaves. Inset picture shows Claus Maiks with his Indigo control line stunt model, see page 416.

Next Month

We have a treat for all modellers interested in Schneider Trophy aircraft. We will be publishing the plan and description of the Macchi M39 1926 winner in our Aircraft Described column. There will also be the start of a two-part article giving plans to build a glider and rubber powered Wigan 70 class models. This is an ideal project for clubs with small flying fields. We will, of course, have Vintage, Free Flight and Control Line News plus trade and book reviews.



Model & Allied Publications Ltd

P.O. BOX 35, BRIDGE STREET, HEMEL HEMPSTEAD, HERTS
HP1 1EE. TEL: 0442 41221

Also publishers of:

RADIO MODELLER — RADIO CONTROL
MODEL & ELECTRONICS —
POPULAR CRAFTS — SCALE MODELS
MODEL ENGINEER — MODEL BOATS
MODEL RAILWAYS — WOODWORKER
MILITARY MODELLING — MODEL CARS
MOVIE MAKER — PHOTOGRAPHY
CLOCKS — PUZZLES DIGEST
PUZZLER'S WORLD
ART & ANTIQUES



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 at a price in excess of the recommended maximum price 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.

Aeromodeller Magazine (ISSN 0001 9232) is published monthly by Model & Allied Publications Limited, P.O. Box 35, Bridge Street, Hemel Hempstead, Herts HP1 1EE, England. Tel: Hemel Hempstead (0442) 41221. Second class postage paid in the U.S. at Milwaukee, Wisconsin and at additional offices. Distribution to North American hobby and craft shops by Kalmbach Publishing Company, Milwaukee, Wisconsin. Tel: 414-272-2080. Distribution to news stand sales by Eastern News Distributors Inc., 111 Eighth Avenue, New York, N.Y. 10111, U.S.A. Tel: 212-255-5620. Distribution to museums and bookshops by Bill Dean Books Ltd., 166 41 Powells Cove Boulevard, Whitestone, New York 11357, U.S.A. Tel: 212-767-6322.

The Advertising 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. The copyright of finished art work originated by the publisher's printers, whether editorial or advertising remains the property of the publishers and may not be reproduced without permission. Advertisement Offices: Model & Allied Publications Ltd., P.O. Box 35, Bridge Street, Hemel Hempstead, Hertfordshire HP1 1EE. Tel: Hemel Hempstead 56117.

Subscription Department: Remittances to Model & Allied Publications Ltd., P.O. Box 35, Bridge Street, Hemel Hempstead, Hertfordshire HP1 1EE (subscription queries Tel: 0442 51740). Direct subscription rate £10.00 per annum, including index. Overseas subscriptions £11.00 or \$25.00.

Change of address: U.S. Postmaster: Send address changes to Model & Allied Publications Ltd., P.O. Box 35, Bridge Street, Hemel Hempstead, Hertfordshire, HP1 1EE, United Kingdom.

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. Photographs should be accompanied by negatives where possible and can only be accepted for use on an exclusive basis for British Copyright. AEROMODELLER incorporates the MODEL AEROPLANE CONSTRUCTOR and MODEL AIRCRAFT and is published on the third Friday of each month prior to date of publication.



Aero modeller PLANS SERVICE

Golden Oldies for Veteran and Vintage



BOWDEN CONTEST by C. E. Bowden ▲
Col. Bowden's famed flier. An elegant elliptical wing design for the F/F or R/C. Span 68in. First published *Aeromodeller* Nov '45. Plan PET/225 Price £2.25



MERCURY by M. Smith ▶
True elegance of line and excellent flight performance make this model a joy to own and operate for F/F or R/C. Span 96in. First published *Aeromodeller* March '53. Plan PET/504 Price £4.50



H.V.450 by Henri Varache ▲
Suitable for either F/F or R/C when originally designed, this elegant model spans 72in. First appeared in *Aeromodeller* March/April '47. Plan PET/262 Price £3.60



BRISTOL 77 RACER ▶
by E. J. Riding
Eddie Riding's fine free-flight scale rubber powered design — an excellent challenge for the vintage rubber flier. Span 45½in. First published *Aeromodeller* Oct. '44. Plan FSR/216 Price £1.85
392



EROS by John Coasby ▲
Elegant 84in. span design with a really fine performance, for F/F or R/C. First published *Aeromodeller* Jan. 1948. Plan PET/280 Price £4.50

VULCAN by D. A. Russell
"D.A.'s" well known scale-like design, ideal for radio control. Wing span 90in. Plan PET/206 Price £4.50



Bucks Duck ▶
by A. Day
Shapely pylon/cabin design with elliptical wing style. Spans 77in. First published *Aeromodeller* Oct. '49. Plan PET/337 Price £2.25



GOLIATH by G. W. W. Harris ▲
Semi-scale Auster style, this was one of the first published British designs for R/C. 108in. span. First published *Aeromodeller* February '49. Plan RC/312 Price £3.60



GUTTERIDGE TROPHY WINNER ▲
by N. Blakclack
Consistent free-flight rubber contest flier in its day, this design represents simple approach of the time. Span 42in. First published *Aeromodeller* July '41. Plan D/138 Price £1.85

MILES KESTREL
by H. Towner
Scale rubber powered design by a well known exponent of the type. Span 39ins. First published *Aeromodeller* Dec. '38. Plan FSR/165 Price £1.85



BLACK MAGIC
by F. Hemsall
Much liked in its day for fine appearance and performance — ideal for either F/F or R/C. Span 60in. First published *Aeromodeller* Sept. '47. Plan PET/268 Price £2.65



COPLANDS WAKEFIELD by Bob Copland
Beautifully streamlined design by one of the best known early Wakefield fliers. Span 44in. First published *Aeromodeller* Dec. '46. Plan D/121 Price £1.85

Many old *Aeromodeller* designs are still available. If you have an old favourite and can quote a design number or a date of publication, we may be able to help.

To: AERO MODELLER PLANS SERVICE

MODEL & ALLIED PUBLICATIONS LTD.
P.O. Box 35, Bridge St., Hemel Hempstead, Herts.

AM/AUG '81

Please supply the following Plans:

Plan No. Name Price

Plan No. Name Price

Plan No. Name Price

Total: NAME (Block Capitals)

ADDRESS (Block Capitals)

Postage: Inland — Up to £1.25 — 30p
From £1.26 — £5.00 — 40p
Over £5.00 — Post free

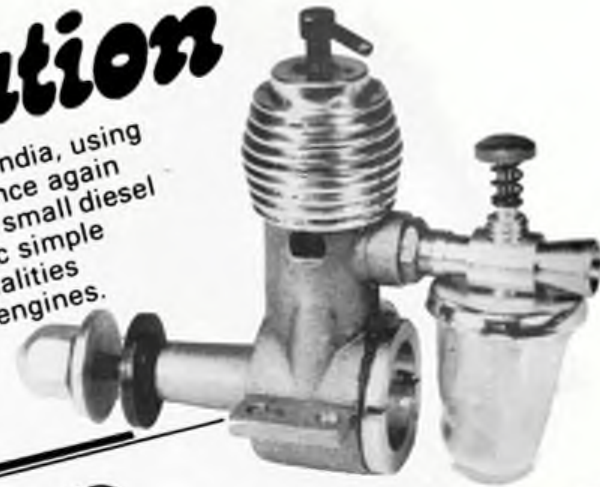
Overseas — Accelerated Surface Post
Up to £3.50 — 65p
£3.51 — £6.50 — 85p
Over £6.50 — Post free

Classic Combination



Recommencement of Production in India, using original Mills Brothers tools has once again made these classic British design small diesel engines available. Characteristic simple operation and easy starting qualities make these ideal beginners' engines.

Mills 0.75cc £12.33
Mills 1.3cc £12.50



MILLS 0.75 & 1.3

ASK TO SEE THEM
AT YOUR LOCAL
HOBBY DEALER



**irvine
engines ltd.**
UNIT 2, BRUNSWICK INDUSTRIAL PARK,
BRUNSWICK WAY, NEW SOUTHGATE,
LONDON N11 1JL
Tel: 01-361-1123

CO₂ POWER From **TELCO SYSTEMS**



TURBO TANK
MODEL 3000

COMPACT ONE PIECE DESIGN FOR EASY INSTALLATION

Now available a small quantity of charging adaptors for use with Sodastream refill bottle.

£10.95 each plus 25p post.

The Original Standard TELCO Motor



£9.84

Available from all good Model Shops

STATION ROAD · EAST PRESTON · LITTLEHAMPTON
WEST SUSSEX · BN16 3AG · ENGLAND

NI-CAD RECHARGEABLE BATTERIES

Size AA 500 mA hr. (for most Tx & Rx) each **£1.10**
Size C 2000 mA hr. (for most R/C cars) **£2.00**
Size D 4000 mA hr. (for starting 1.5v glow engines) **£3.80**

KIT FOR CHARGING AA SIZE BATTERIES

From a 12-volt DC supply (see July *Aeromodeller*) **£3.00**
Plastic Box suitable for above kit **£1.50**
12-volt DC Power Supply Kit **£2.00**
Battery Holder for 4 AA Batteries **30p**
MES Bulb and Holder for Cap Testing **60p**
0.5 amp Ammeter for checking glow plugs **£3.00**

Min. Order £2.00 — P&P 30p.

THE COMPONENTS CENTRE
7 LANGLEY ROAD, WATFORD, HERTS.

OPEN! OPEN! 13th JULY, 1981

WINDSOR MODEL SHOP

45 Albany Road, Windsor, Berks.
Telephone: Windsor 56321

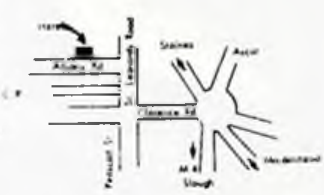
Specialists in Radio Control Model Kits and Accessories.

OPEN: Mon. to Sat. 9 a.m. - 6 p.m.
Late night Fri. 7 p.m. Half Day Wed.
9 a.m. - 1 p.m.

Stockists of: Futaba, Micro-Mold, Associated, Mardave, Irvine, MacGregor, Robbe, Humbrol, Ripmax, Pilot, Kyosho, D.P.R., Sanwa, Tamiya, Graupner, Powermax

Latest Simprop Radios in stock.

ACCESS AND BARCLAYCARD WELCOME!



**RIPMAX
FUTABA**

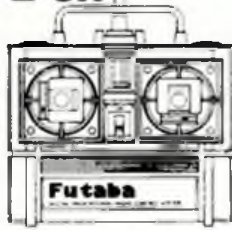
DRYCELL
or NICAD
COMBOS
SERIES

NOW
ON

35MHz



2-CH



35MHz FM COMBO £51.50
(Rudder & elevator on gliders)

3-CH



35MHz FM COMBO £60.00
(Rudder, elevator, ailerons)

Forget about interference from CB radio. NOW you can switch to 35MHz 'aircraft' frequency with the PERFORMANCE AND RELIABILITY that the name Ripmax-Futaba guarantees. The FULL RANGE of 'L' Series Combos are now available in FM 35MHz — double-protection for troublefree operation. With a choice of 2-, 3-, 4- or 5-channel working. Fully TYPE APPROVED.

SAVE ON INITIAL COSTS, too, by starting with a Drycell Combo — and add only the number of Servos you ACTUALLY need. Convert to All-Nicad working later, if you wish. (The 5-ch. Combo is only available in All-Nicad version to ensure maximum performance working 4 or 5 servos).

'L' Series Combos, part of a great system from the world leaders in digital proportional radio controls. And they work with ANY 'M' Series Servo.

Prices shown are for Drycell Combos (except 5-ch.) and include Tx and Rx, Rx Battery box, wiring harness with switch, 1 pair of Crystals and frequency pennant. Batteries and Servos are extra.



'M' Series SERVOS include NINE different types suitable for AIRCRAFT use. With Drycell working, we particularly recommend the FD2M or 3M as these are special low current drain types, ensuring maximum battery life. For small aircraft the FD30M MIGHTY MIDGET is ideal (weight only 0.9oz).

**RIPMAX-FUTABA
SERVOS**

FD17M MINI	£18.00
FD18M RETRACT	£20.00
FD21M LINEAR	£18.00
FD26M SPL MICRO	£18.00
FD30M MTY MIDGET	£17.50
FD32M STD MINI	£11.00
FD33M STD MICRO	£11.00
FE25M EXPERT	£22.50
FE25MG EXPERT RCT	£25.00

4-CH



35MHz FM COMBO £80.50
(Full-house aircraft controls)

5-CH



35MHz FM COMBO £115.50
(Full-house + flaps/retracts)

5 channel is ALL NICAD only. Price includes Nicads and charger.

RIPMAX-FUTABA AT YOUR MODEL SHOP

QUESTION:

What flies, sails, races, soars, revs, hovers, instructs, informs, and is on sale now - for only £1.00?

ANSWER:



M.A.P. Ltd.'s new *Radio Modeller Review* answers all the questions on every aspect of modern radio control.

It takes a long, detailed look at the 'state of the art' as it exists today (it's smack up to date with all the latest thinking on the 27/35 MHz AM/FM questions and the new sets) and includes chapters on:

● What R/C control equipment does ● How it works and what to buy ● R/C motors and engines ● Aircraft ● How to get started ● R/C aircraft for beginners ● Going solo ● Fault finding and maintenance ● R/C boats ● R/C helicopters ● R/C cars.

In short, *Radio Modeller Review* is an invaluable yet inexpensive essential to help you understand and get the most from this exciting model hobby.

Radio Modeller Review (A4 size, 76 pages) is on sale now at all good model shops and newsagents, price £1.00 or, in case of difficulty, price £1.25 including postage direct from M.A.P. Subscription Dept:

Model & Allied Publications Ltd

P.O. Box 35, Bridge St., Hemel Hempstead, Herts HP1 1EE



Joy-Plane the name that sticks

There's no better balsa cement than Joy-plane. It sets hard in no time at all, penetrating deeply and resisting heat and fuel.

Quality products for sticking, staining, polishing, painting

JOY is a registered trademark of Turnbridges Ltd., London SW17

BRITISH MADE P.A.W. HIGH PERFORMANCE DIESEL ENGINES

BACKED BY
'BY RETURN'
SPARES SERVICE
POWERFUL, ROBUST
DEPENDABLE



2 MONTH'S
GUARANTEE

All inc. 15% VAT

NEW P.A.W. 80	£11.50
1.49 Contest Schnuerle type porting	£14.95
P.A.W. 1.49-DS	£12.08
P.A.W. 2.49-DS	£13.23
P.A.W. 19-DS	£14.38
EXHAUST MUFFLER for 1.49, 2.49, 19	£1.38
P.A.W. SILENCER SET for 1.49, 2.49, 19	£4.03
Well within 82dB/7 metres limit for quiet power,	
2.49 A/C R/C DIESEL (fitted silencer)	£20.70
19 A/C R/C DIESEL (fitted silencer)	£21.85

Obtainable from Model Shops — or write to:

PROGRESS AERO WORKS
PARK MILL, HOBSON STREET,
MACCLESFIELD SK11 8BE

KIT PRICES SLASHED

SAVE UP TO £8.90

THE BEST of BRITISH kits — now available to you at SUBSTANTIAL PRICE SAVINGS



GRADUATOR . . .

A genuinely docile full-house trainer. Even a novice can fly it in 'trainer' trim. Move the balance point $\frac{1}{2}$ " back and you have a fully aerobatic model capable of advanced manoeuvres. Takes 35-40 engines. Kit includes pre-cut wood parts, foam wings and fuselage decking, shaped u.c. hardware

WAS ~~£38.85~~
NOW **£29.95**



RIPMAX TRAINER

Good looking. Easy to build. Really satisfying to pilot! The forgiving flight characteristics makes this the ideal trainer with rudder, elevator and throttle control (3-channel radio). And once you have learnt how to fly, it is fully manoeuvrable. 57" wingspan with rugged construction. It will take a wide range of engines, too — from 10 to 30. For the first-time learner-pilots we recommend a 15 or 19 engine.

WAS ~~£35.50~~
NOW **£29.50**



IVINGHOE MkII . . .

72" span of sleek flying beauty — an established favourite R.C. sailplane. This is the updated version with revised kit contents containing pre-cut and pre-shaped parts and necessary hardware items. Low wing loading ensures good soaring performance. Looks like a full-size sailplane in flight.

WAS ~~£24.49~~
NOW **£20.75**



MONARCH SHIKARI

63" span. Wing area 390sq in for rudder, elevator and aileron control (3-channel radio). Thick semi-symmetrical wing ensures good lift in all manoeuvres — including inverted flight! Fast, easy assembly with veneered foam wings, pre-cut wood parts, hardware and R.C. links.

WAS ~~£27.60~~
NOW **£21.95**



MONARCH SHOGUN

67" span intermediate semi-aerobatic soarer for the not-so-expert pilot. Stable flat-bottom aerofoil and generous 490sq in. wing area gives a smooth flying docile model — yet aerobatic at your command. Equally at home for bungee launching or slope soaring.

WAS ~~£27.50~~
NOW **£21.80**



DELTA LADY . . .

The excitingly different aerobatic slope soarer with exceptionally wide speed range. You can soar it in winds of about 10mph, yet still penetrate in winds of 50mph without adding ballast. 54" span. Wing area 860sq in. Kit features MOULDED GRP FUSELAGE, veneered foam wings, pre-shaped wood parts and COMPLETE accessory pack.

WAS ~~£44.50~~
NOW **£42.50**



MONARCH OSPREY

100" span (100" class) thermal or slope soarer for sport or contest flying. 713sq in. wing area. Loading 7.02 per sq ft. Fly on rudder and elevator (2-channel radio). Kit includes pre-cut and pre-shaped fuselage and tail parts, wing ribs, spars, etc. and complete hardware.

WAS ~~£34.65~~
NOW **£27.80**



The RIPMAX TRAINER kit sets a new standard for pre-fabrication and COMPLETENESS. Pre-cut and pre-shaped balsa and ply parts, engine mount and mounting accessories, pre-shaped u.c. wheels, wheel retainers, fuel tank and fuel tubing spinner, all R.C. links and horns, complete down to modelling pins, adhesives and a modelling knife!



AILERON TRAINER

Like the standard RIPMAX TRAINER but with a foam wing with strip ailerons. (Requires 4-channel radio). Power by a 19-35 engine and you have a superb fully-aerobatic model for advanced training or sports flying. Reserve of built-in stability makes piloting easy. 57" wingspan.

WAS ~~£36.30~~
NOW **£32.50**

AVAILABLE AT ALL RIPMAX STOCKISTS



**Super Strong, Self-Adhesive, Shrink-on
Covering Material for Flying Models**

SOLARFILM IS RECOMMENDED FOR ALL RADIO CONTROL MODELS, CONTROL LINE MODELS AND FREE FLIGHT SPORT MODELS INCLUDING GLIDERS.

- EASY TO USE** in one simple, clean, easy operation you cover your model with a tough, strong skin — get a super high gloss finish in brilliant colours.
— make your model fuelproof, waterproof and easy to clean.
- IMPROVES FLYING PERFORMANCE** — Solarfilm is much lighter than ordinary high gloss finishes — and light models fly better.
- NEEDS ONLY THE SIMPLEST TOOLS** — a domestic clothes iron, scissors and modelling knife are all you need.
- CLEAN AND SAFE** — does NOT need dopes, thinners, brushes, sanding sealers, etc. — so the smell, mess and fire risks are reduced.
- DURABLE** — Solarfilm does not crack, fade or wrinkle with age.
- VERSATILE** — can be used to cover open frame or sheeted construction, can be formed round compound curves such as wing tips; can be cut out to make letters, insignia, stripes, etc.

SOLID COLOURS: White, Yellow, Red, Black, Silver, Dark Red, Orange, Tropic Blue, Midnight Blue.

METALLIC COLOURS: Green, Gold, Red, Blue

TRANSPARENT COLOURS: Yellow, Red, Blue, Orange

From all good model shops. Sheet sizes: 36" x 26" 50" x 26" and off the roll

S. A. E. will bring you a free sample, of Solarfilm plus illustrated sheet and colour shade strip.

SOLARFILM, ACKHURST ROAD, CHORLEY, LANCS. PR7 1NH

Sullivan

Control Line Accessories

Pylon Brand instant-use control line cables and storage reels

008" (2 x 26ft)	£1.20	015" (2 x 70ft)	£2.84
012" (2 x 35ft)	£1.30	018" (2 x 52ft)	£2.56
012" (2 x 52ft)	£2.48	018" (2 x 60ft)	£2.64
012" (2 x 60ft)	£2.56	018" (2 x 70ft)	£2.92
015" (2 x 52ft)	£2.52	Storage Reel 4" dia	45p
015" (2 x 60ft)	£2.64	Storage reel 5" dia (deluxe)	£1.30



Sullivan lead-out cables

Class A-B loop end kit	65p
Class C-D loop end kit	65p



Sullivan line connectors

Small (packet 2)	25p
Large (packet 2)	25p



**ASK TO SEE IT AT
YOUR LOCAL HOBBY
DEALER**



irvine engines ltd.

UNIT 2, BRUNSWICK INDUSTRIAL PARK, BRUNSWICK WAY,
NEW SOUTHGATE, LONDON N11 1JL. Tel: 01-361-1123

DAVIES CHARLTON LTD

HILLS MEADOW, DOUGLAS,
ISLE OF MAN

TELEPHONE: 0624 4224(5)

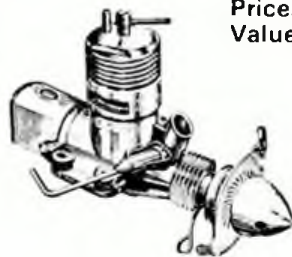
QUICKSTART

**YOU INCREASED DEMAND!
SO WE INCREASED PRODUCTION!
ALL PRODUCTS NOW AVAILABLE EX STOCK**

ENGINES



DART 0.5cc DIESEL £11.25



MERLIN 0.75cc DIESEL £10.50

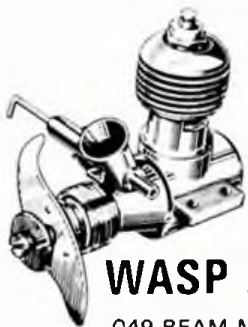
Prices include
Value Added Tax



SPITFIRE 1.0cc DIESEL £11.62



SABRE 1.5cc DIESEL £11.82



WASP £8.20

.049 BEAM MOUNT GLOW



BEE £10.35

.049 RADIAL MOUNT GLOW

ACCESSORIES



ENGINE TEST STAND £2.53



CONTROL LINE HANDLE £1.59

Quick Clip Connector/Lead .. £1.73

G16 Short Reach Glow Plug .£1.01

Wasp/Bee Silencer £3.24

Merlin Silencer £1.61

Sabre/Spitfire Silencer £1.73

D.C. Props, Nylon 8 x 4 75p

7 x 4 63p

6 x 4 51p

5 1/4 x 3 1/2 51p

Mounting Bolt Sets 37p

**BACKED BY COMPLETE
SPARES SUPPLIES**

**EVERY ENGINE CARRIES WRITTEN GUARANTEE
D.C. PRODUCTS AVAILABLE MOST LEADING WHOLESALERS**

Appointed official service
agents:
FOX MANUFACTURING CO.
(UK), The Haven, Rixey Park,
Chudleigh, NEWTON ABBOT,
Devon TQ23 0AN.



Swedish Control Line International

An opportunity to get a preview of the 1982 World Control Line Championship site comes in a late announcement from the Oxelösund Model Club, Sweden. They invite competitors to their all-classes, including Handicap Speed Contests over the weekend of August 8/9th at Oxelösund which is 120 kilometres south of Stockholm. An aerial photograph and ground plan convinces us this will be one of the most scenic locations yet for any major control line championships.

Camping and hotel accommodation is available. Intending visitors for the 1981 contest should advise Hans Fallgren, St Annegatan 18, 61133 Nyköping.

Free Flight Nats Prizewinner No. 397

The raffle held at this year's Nationals in aid of the Free Flight Team travel raised a magnificent £113.40 — this was all due to the efforts of four children!

The winning ticket No. 397 was drawn by Mrs. Eve Cosh. The holder of the ticket is invited to send the ticket with a covering letter to R. Nudds, The General Secretary, SMAE, Kimberley House, Vaughan Way, Leicester, to collect his/her prizes: One year subscription to *Aeromodeller*, One year membership (any class) of SMAE, one year insurance through SMAE scheme, plus £15 in value of free flight goods from SMAE F/F supplies through David Stapleton.

R.Ae.S. Mini Rotorcraft Competition

Eight firm entries and over 60 positive enquiries have been received so far for the Challenge Mini Rotorcraft Competition to be organised by the Rotorcraft Committee of the R.Ae.S. in 1982. Top prize of £1,000 is to go to the longest duration in controlled hover of a rotorcraft not exceeding 5kg (including fuel), and another £500 prize to be awarded for design ingenuity. The Final is to be held 3/4th July 1982 at RAF Finningley, Nr. Doncaster. Object of the competition is to develop new design techniques in small rotorcraft.

The closing date for registration has been extended for a few weeks beyond original date of 31st July 1981. Full details are available from the Secretary, Royal Aeronautical Society, 4 Hamilton Place, London W1V 0BQ.

Miniature Historic Biplane Exhibition

The Fleet Air Arm Museum, R.N.A.S. Yeovilton, Somerset, have a new permanent exhibition of 1/48th scale models, of significant early biplanes manufactured in this country. Types range from the Bristol Boxkite to the Gloster Sea Gladiator and are, all built by a local modeller Tim Elsmore.

Royal Aero Club Award

S.M.A.E. Chairman John Jones has been awarded a Bronze Medal by the Royal Aero Club for his services to aeromodelling. Among John's many achievements perhaps the best known are his successes in dealing with radio frequencies and we are sure the one which gave him greatest personal satisfaction, the exemption of competition fees from Value Added Tax. Congrats John!

P. M. H. Lewis †

Devotees of control line models, particularly those who were active in the 50s and 60s will be sorry to learn that Peter Lewis died recently. Our Plans Handbook still contains many of his designs, originated through the realms of *Model Aircraft*. In later years Peter exercised his extensive knowledge of aeronautical history by writing books, notably *Squadron Histories*, which has been the most authentic record of RAF Squadron codes and Fighter Squadron markings since it first appeared in 1959. His other titles were equally valuable milestones of historical record, notably *British Racing and Record Aircraft*, *British Bombers* and *British Fighters Since 1912*, all published by Putnam, plus a classic *British Aircraft 1889-1914*.

Air Pageant Bournemouth — Hurn Airport July 19

Most of the major flying displays at last year's show, spread over two days, are to be included in this one day event. This will obviously make an action packed display. The RAF Red Arrows will be there flying their new Hawk aircraft, as well as the RAF Falcons free-fall parachute team. Battle of Britain aircraft enthusiasts will have a treat, with a fly past of a Spitfire, Hurricane and a Lancaster. There will also be a Meteor and a Vampire on show.

The Royal Navy is putting on a good show, with an historic flight of a Swordfish, Sea Fury and Firefly.

The Army not wishing to let the RAF and the Navy have all their own way, are being represented by their top parachute team the Red Devils.

Aerobatics of all kinds will be a key-note of the display and will include this year's British Aerobatic Champion Philip Meeson. Opening time is 9am with the flying programme starting at mid-day.



July 19th
SMAE MEETING R C FAI AEROBATICS Venue Barkston Heath SMAE MEMBERS ONLY Contact Geoff Franklin, Tel 0533 548313

July 19
F F WESTERN AREA RALLY SMAE MEMBERS ONLY Venue Merryfield Contact George Lynn, 0242 32732

July 19
DOUG BLAKE MEMORIAL TROPHY OPEN AND NOVICE Pre entry Venue Radlett Contact Glen Alison, Rickmansworth 12675

July 19
PETERBOROUGH MFC 3RD ROUND CLASS A DIESEL COMBAT Venue 4 Beech Road, Glington, Peterborough PE6 7LA Tel Peterborough 107331 252645

July 19
SHUTTLEWORTH MODEL GROUP OPEN DAY C.L. F.F. Special contest for STAND OFF C.L. SCALE and F F RUBBER

July 19
WHARFSALE DIESEL COMBAT 10.00am start Venue Duwsbury, Nr Wakefield Contact Jeff Smith, Tel 0532 663432

July 19
BATH MAC WESTERN AREA RALLY, F F O P O'R, O-G, ALL IN CO, AND HLG, C/L FAI COMBAT, A COMBAT TEAM RACE FAI AND A Venue Merryfield, Ilminster, Somerset Contact E Burles, Tel 331126

July 26
SMAE 3RD CENTRALISED C.L. EVENT GOODYEAR, FAI T.T., FAI SPEED, A AND FAI COMBAT, AEROBATICS NOVICE AND F2B CARRIER O&P Venue Fulbeck, Nr Barkston Heath

July 26
C.L. A & FAI TR. SPEED A & FAI COMBAT AEROBATICS N & F2B CARRIER O & P Venue Fairford

July 29
CROYDON & DMAC CONTEST FOR A1/A CDH, CO HLG Venue Chobham Common, Surrey Contact R Elliott, Tel 01 997 1563

August 2
SMAE LONDON AREA MEETING — C.L. SPEED ONLY Venue Old Army Parade Ground, Bicester Contact Paul Eisner, Tel Lea Valley 760849

August 1-2
LIMBURGSE VLEUGELS INTERNATIONAL INDOOR CONTEST F1, E2B, PEANUTS VenueL Genk, Belgium

August 2 (changed from July 19)
ELLIOTT SUMMER RALLY — A TEAMRACE GOODYEAR FAI TEAMRACE A COMBAT CARRIER (PROFILE 40) Venue Marconi Avionics, Rochester, Kent Contact Peter O'Neill, Tel 0732 57899

August 2
SMAE F F MINI MEETING A1, CDH, A, HLG, CO DURATION FAI TEAMRACE Mike Coomes, Tel 0949-42034 SMAE MEMBERS ONLY

August 2
T S F3B UK INTERNATIONAL Contact Geoff Dallimer, Tel 04626 78745 SMAE MEMBERS ONLY

August 9
3 KINGS CARRIER DAY OPEN & PROFILE CARRIER to SMAE rules Entry 75p Trophies to 3rd place in both classes 'Tune up' lot eh Nats at Old Croydon Aerodrome, Purley Way, Croydon, Surrey Contact D Bird, Tel 01-874 6394

August 9
T S F3B SOARING LEAGUE Venue Swindon Contact Geoff Dallimer 04626 78745 SMAE MEMBERS ONLY

August 9
R C FAI PYLON Venue Fulbeck Contact Keith Hulson 0462 81270 SMAE MEMBERS ONLY

August 16
AEROMODELLER VINTAGE DAY — Old Warden

August 29-30
FIFTH INTERNATIONAL CONTEST CLUB DE PETITE AVIATION Sai F10, E2B, Penny plane Sun Peanuts and 'Saintes Formules' Day Prizes, cups and medals to all Venue Omnisports Hall 'Andre Cools' rue Beau Site, Fiemalle, Belgium Contact F Van Hauwaert, Grand place 1 boite 52, B4110, Fiemalle, Belgium

August 29/31
F F 29 OPEN EVENTS 30 31 CONTEST CLUB CHAMPS Contact Dave Goodwin 0742 847894 SMAE MEMBERS ONLY

August 29 31
 Indoor Nationals **ALL CLASSES INCLUDING CO, DURATION AND HLG** Venue Cardington

August 29 31 NATS
SCALE R C, C L, T S, NATIONALS Venue Barkston Heath, Cranwell Contact Katch Watson 0533 412368 SMAE MEMBERS ONLY

September 6
FINAL F1A MICROFILM TEAM TRIALS Venue Cardington

September 6
R C FAI AEROBATICS Venue Gloucester Contact Geoff Franklin 0533 5488313 SMAE MEMBERS ONLY

September 6
PETERBOROUGH MFC 4TH (FINAL) ROUND CLASS A DIESEL COMBAT Venue The Embankment, Peterborough Contact Neil Gill, 4 Beech Road, Glinton, Peterborough PE6 7LA Tel P boro (0733) 252645.

September 6
NORTHERN AREA RALLY ALL CLASSES F F, C/L R/C RAF CHURCH FENTON SMAE ONLY Contact 0532 864026

September 13
BATH MAC F F O P O R O G ALL IN FAI ALL IN MINI CO AND HLG Venue, Colerine, Nr Bath, Avon Contact E Burles Tel Bath 331126

September 13
C L ALL FAI CLASSES (INVITATION ONLY) Venue Three Sisters Contact C L Tech Comm Chairman SMAE MEMBERS ONLY

September 13
3 KINGS C L SCALE DAY STAND OFF AND PROFILE SCALE Entry £1. Prizes and trophies to 3rd place in each class. Venue Old Croydon Aerodrome, Purley Way, Croydon, Surrey Contact D Bird Tel 01 874 6394

September 13
F F 5th AREA CENTRALISED Venue Area Contact Dave Goodwin 0742 847894 SMAE MEMBERS ONLY

September 20
T S F3B SOARING LEAGUE Venue Maidstone SMAE MEMBERS ONLY Contact Geoff Dallimer 04626 78745

September 20
CO. AND HAND LAUNCHED GLIDER TROPHY FINALS Venue Cardington

September 20
SMAE MIDLAND AREA F F MEETING O/R, O/G, O/P, COMBINED MINI, HLG, CO, VINTAGE DURATION Venue Barkston Heath Contact G Ferer, Tel 0533 886519

September 20
SMAE LONDON AREA MEETING - C L SPEED ONLY Venue Old Army Parade Ground, Bicester Contact Paul Eisner Tel Lee Valley 760849

September 27
ROMANWAY MFS VINTAGE & ELECTRIC FLY-IN/R C ASSISTED; ALSO CONTROL LINE Venue to be announced SAE to G Johnson, 37 Oxford Road, Kirtlington Oxon

September 27
BATH MAC F F O P O R O G ALL IN FAI ALL IN MINI CO AND HLG, C L FAI COMBAT, A COMBAT, TEAM RACE FAI & A POSSIBLY AEROBATICS Venue Merryfield, Nr Ilminster, Somerset Contact E Burles, Tel 331126

September 27
C L F2C Venue Ellimts, SMAE MEMBERS ONLY Contact C L Tech Comm Chairman

Sept. 27
F F 6th AREA CENTRALISED Venue Area SMAE MEMBERS ONLY Contact Dave Goodwin 0742 847894

September 27
R/C FAI Pylon Venue Fulbeck SMAE MEMBERS ONLY Contact Keith Hutson 0462 81270

October 4
AUTUMN KITE FESTIVAL Old Warden Airfield, Beds

October 4
R C FAI AEROBATICS Venue Bullford Camp SMAE MEMBERS ONLY Contact Geoff Franklin 0533 548313

October 4
SMAE SOUTHERN GALA F F O P O G O R A, Cdh, A1, HLG & CO, C L F2B and NOVICES R C SCALE STAND OFF AND STANDARD AEROBATIC Venue RAF Odiham Hants SMAE MEMBERS ONLY Contact N F Couling, 7 The Green Walk, Willingdon, Eastbourne, East Sussex

October 11
SMAE NORTHERN GALA F F OR RPG, C L A FAI CLUB R C AEROBATICS for SMAE Trophies Plus other non SMAE events SMAE only Venue Church Fenton Contact 0904 76794

October 11
R C FLY FOR FUN SMAE MEMBERS ONLY Contact Dick Hall 0705 593048

October 11
F F RUBBER SMAE MEMBERS ONLY Venue Barkston Heath Contact Mike Coomes 0949 42034

October 11
T S F3B SOARING LEAGUE Venue Church Fenton Contact Geoff Dallimer 04626 78745 SMAE MEMBERS ONLY

October 18
ELLIOTT AUTUMN RALLY B TEAMRACE, GOODYEAR,

FAI TEAMRACE A COMBAT SPEED AEROBATICS Venue Marconi Avionics, Rochester, Kent Contact Peter O'Neill Tel 732 57899

October 18
NORTHERN AREA FAI MEETING F F F1A B&C C L F2B AND C R C F3A AND B two flights before 1pm SMAE ONLY Venue Church Fenton 0653 2580

October 18
PETERBOROUGH MFC A COMBAT Venue The Embankment Peterborough Contact Neil Gill, 4 Beech Road Glint, Peterborough PE6 7LA Tel P boro 0733 252645

October 18
SCALE AUTUMN MEETING R C STAND OFF C L SUPER SMAE MEMBERS ONLY Venue RAF Upwood Contact John Long

October 25
THE WITCHFORD MEETING F1A F1B, F1C, A L GLIDER, COUPE D HIVER, A POWER Profits will go to charities for the disabled. Witchford is two miles SW of Fly, Cambs, and the site is a very large area of farmland with no crop problems, perimeter tracks and runways allow vehicles access to launch points for all winds SAE to Martin Dilly, 20 Links Road, West Wickham, Kent

November 8
ANGLIA MFC WAKEFIELD CONTEST (a) Models to 1953 Wakefield (a) s including freeflane designs, (b) Published 'Vintage' Wakefields to pre 1951 rules, (c) models to current F1b rules Venue RAF Watton Contact Bob Wells Tel Hornchurch 40859

November 22
MINI CLASS CONTEST Cdh A 1, A POWER CO, DURATION SMAE rules to apply. Good prizes will be presented at the close of the event. Venue RAF Watton Contact Chris Bianchi Tel 92 740431

EVENTS

June 28
MAIDENHEAD MODEL MAKERS CLUB EXHIBITION R C FLYING MODEL DISPLAY, STOT CARS 1.00pm start Entrance 50p Venue Braywick Road, Rugby Ground Maidenhead

September 3-5
THE EIGHTH BUSINESS & LIGHT AVIATION SHOW AND CONVENTION SPONSORED BY FLIGHT INTERNATIONAL AND AVIATION MAGAZINE Venue Cranfield

October 9-11
SCALEDOWN 81 EXHIBITION 14 categories including two for aeromodelling. Flying and Static. Venue Brian O'Malley, Central Library and Arts Centre, Rotherham Contact R Milnes, 528 Retford Road, Woodhouse Mill, Sheffield S13 5WE



Starting next month

The great

Aero modeller

and it's all FREE!

Every reader has the chance to win.

GIVE-AWAY CONTEST . . .

£250

of modelling equipment must be won every month . . .

IT ALL STARTS IN SEPTEMBER ISSUE — on sale August 21st

It's all so easy . . . just make a simple identification on a model - that's all you do to win a brand new radio control system!

Many other items to win in coming months!



Henry Hutchins launching his K&B powered model in the Open Power event.

THE POLICY of running every Free Flight event you can think of plus a few you haven't thought of, yet all in a three day Nationals poses a considerable planning problem. This year, as last, the relatively tidy schedule of Minis the first day, Open the second and FAI the third was retained. However as the majority of entrants are competitive in at least two and often three Mini classes the number of flights involved on this first day can make Saturday a daunting prospect. To compound the problems prompt arrivals were greeted with heavy and continual rain with a considerable southerly wind.

SATURDAY — MINI EVENTS

By noon the rain had eased and we experienced the first of the small fronts that were to play havoc with the wind direction and give the organisation a headache for the entire weekend. The breeze dropped off to 10 mph and swung away to the south west and as Control was sited on the east corner of the 'drome, flights were soon going outside the field. A considerable number of good starts were made during this period as the sun broke through and the wind continued to slacken. Judging by the gathering clouds overhead, the calm was to be short lived but at the crucial moment Control was moved to the other end of the airfield and contestants wasted one of the best periods of the day packing and unpacking. Moreover just as soon as Control had be

reestablished the wind returned in both strength and its original direction so once again models were taken straight out of the drome but this time on the other side! To make matters worse, flights were now being taken in Barkston's notoriously turbulent patch, downwind of a small valley and two ridges of trees.

Thermal picking and flying small models was awkward. Russell Peers flew too early and dropped his first flight in 1/2A and many others made bad mistakes in the 15 mph turbulence. Models that got away did beautifully but those that didn't floundered around low down.

It wasn't long before Control was moved again back to its original place where it stayed only a few minutes as more rain brought a wind shift back to south west once again and models were going out of the 'drome on the east side as they had been in the morning. It wasn't until this third move that the weather co-operated slightly and by 3 pm some flights were actually going down the centre of the airfield rather than flying across various corners. As had been hoped, the wind decreased from now until the end of the event at 7 pm and many — who had either not started, or had been too busy packing and unpacking to spoil a flight — took advantage. Maxes were plentiful for a few hours and it seemed to be a 'Nationals' at last. Philpott finished a perfect score in CO₂ and didn't get around to A/1 until nearly 6 pm, but his total was still good enough for 4th. Ken Smith who had actually done better in the worse con-

ditions earlier and only spoilt his score when things improved was sitting pretty on a little over 9 minutes. He had no expectations of winning however as Brian Lavis looked all set with four maxes up. Brian only needed a mediocre flight to win — he did 37 secs to leave Ken the winner and Chris Parry in 2nd after dropping a little on two flights.

Of the leading five in Coupe d'Hiver, Mick Chilton — also in last years fly off and that had been his first Free Flight Contest — managed a full score holding a comfortable lead over Sanderson who had dropped a 1.51 and a 1.43. Gerry Ferer winner in '79 — brought up third with two slightly dropped flights.

In 1/2A Power Trevor Payne, after completing a neat full house with his very light 1/2A Train derivative, watched others start later and come very close to this total. Mike Bull — winner in '78 — now using a virtually brand new model and sensibly spending the poorer weather flying his less important events secured 2nd with a 5 sec drop off the first flight and then four maxes. Sayer dropped twice — both 1.40ish but his final total was good enough for 3rd.

In HLG the favourites were ousted by Edmonson. He did not complete a perfect score but it was sufficient to hold down Ball and Buskell who were but 1 second apart at 2nd and 3rd.

When the final hooter blew at 7 pm it was only CO₂ that required a fly off. This appeared surprising on the face of it but a good CO₂ model is



Heading photo shows the mass launch of A2 (F1A) on the third day of the Nats. Left: FAI winners (left to right) John Bailey - Power, Mike Fantham - Glider, Dave Greaves with his Wakefield model. Right: Graham Neil, winner of the Frog Junior event gaining a total of 11:02.





Above: Jeff Smith launching his Super Nog at the fly-off of the Open Power. Left: Dave Hipperson with his Lanzo Stick, winner of the Vintage Rubber. Right: beautifully built Chester Lanzo 1936 Wakefield by Bernard Aslett who won the Vintage Wakefield, being helped by Derl Morley. Below left: Phil Ball just after winning the Open Rubber fly-off. Below right: Russell Peers launching his tailless model that won him the Shelley Trophy. Russell also came first in the Wigan 70 event.

capable of well over the max in calm air and many had wisely chosen to wait and fly it last. Of the four qualifiers only Gibbs of Birmingham had achieved his total on 5 flights — the rest had needed their sixth. However he was at a disadvantage now as he had lost his best model earlier in the day, conditions were cooling fast and the wind showed no signs of slackening much below 10 mph. In the flyoff itself, Hipperson flew quite early and his model stayed rather low for the first 30 secs due to turbulence over the trees and a slightly sick run. His 2 39 got just to the other end of the 'drome. Steve Philpott who had flown doggedly throughout the worst of the day's weather climbed faster and higher and was a deserving winner with a flight a few seconds short of three minutes. Blanche and Gibbs both broke the max but only enough for 3rd and 4th

maximum use of the airfield space and as a further concession to the wind, hand launching was allowed in the Vintage Duration event. The weather in fact improved throughout the day — some forecasts had implied it would — and by 6 00 pm it was almost calm with bright sunshine ... but more of that later.

The 2 20 max seemed to have various effects on the way people approached the contest. The possibility of an improvement in the weather encouraged some to wait while those involved in several events started putting in their flights. At least it wasn't raining! Could it be that a short max encourages a more relaxed approach because it sounds easy? There is some evidence for this — the fly-offs were not as large as some had suggested they might be and conditions were not really bad enough to explain the short fall. Three 2 20 flights might sound like a formality, but a few must have regretted treating them as such!

Phil Ball of the Grantham Club, last year 'robbed' of the Model Aircraft Trophy by a time-keeping problem, nearly provided this year's first hard luck story with a 2:21 flight, however this was from far too short a D/T. John O'Donnell's first Open Rubber flight had the opposite kind of air: the model D/T'd over the airfield but it was in such strong lift that it remained airborne for fourteen minutes, eventually landing about three miles away, north of Ancaster. John was well after it however, cycling down a convenient road

with the wind behind him. He found the model easily enough but nearly lost his bike when he dismounted to pick up his aeroplane. The local constabulary arrived at the critical moment and were about to impound the cycle because they thought it had been dumped at the roadside!

Geoff Higgins the expatriate Englishman who has moved to Holland via Australia was in attendance with Arno Hacken, Dutch F1A team member for the World Championship in Spain this August. Geoff D/T'd early on his first Open Glider flight, proving that it is not so easy to re-think your timer setting for a funny max ... wonder if it had a scroll type timer? Arno made no mistakes however and worked his way through to the fly-off to keep the Dutch Glider Flag flying.

As usual there were hardly any 'special' Open Glider models to be seen, most people fly A/1s, A/2s or intermediate models, often kits. Mike Bull had a model of around A/2 size but only 2/3 of the weight but he didn't think there was much advantage to it, except in very light lift. Even the large lightweights of ten years ago have disappeared — remember the twice size Caprices that used to feature in fly-offs?

In Open Power the Smith family were clearly present and on form right from the start. The nine qualifying 'Super Nog' flights that Tony, Jeff and their father, Tom, made were all maxes. The climb patterns of the Super Nogs are consistent in that they always get very high, but the routes followed

SUNDAY MAY 24th — Open events Report by Mike Fantham

When the contests opened at 10.00 am there was a stiff south westerly breeze blowing almost straight down the main runway. The contest director for the day was SMAE Free Flight Technical Committee member and local flyer, Mike Coomes. Mike set the 'Max' at 2 20 in an attempt to keep models on the field and minimise crop problems, fortunately there was virtually no trouble in that respect at this meeting. A downwind launch limit line was also imposed to make





Exhausted, but happy group of flyers after the HLG scramble



Jim Shelley's vintage 'Westerner' designed by Elbert Weathers in 1938. The model is powered by a new engine by Gerald Smith which is called the 'Skylark' and uses magneto spark ignition. It was the champion for sport vintage run by S.A.M.



Chris Parry is still a junior and overall glider champion!

vary somewhat! Left rolls, right rolls and inverted flight all play their parts as the '40' motors drag their Super Nog airframes up the eye straining climbs, reaching what must be seven or eight hundred feet in a shade under ten seconds!

Mike Fantham decided, early in the day, to wait for the promised improvement in conditions before making his glider flights. Mike ran the sponsored chuck glider contest which finished at about 5.45 pm and then, noticing that the wind was dropping, decided to make an effort to qualify for the fly-off in Open Glider. He was ready to start by 6.00 pm and with the help of a co-operative timekeeper, to return the card quickly between flights, had the pleasure of watching his last max D/T at 6.22 pm! The contest closed at 6.30 pm. Dave Hipperson took advantage of the same lull to fly Vintage Duration and many others just went out and flew for practice because the weather was so good.

The only event decided without resort to a fly-off was the Women's Cup; Betty Tyson made a perfect score with her A/2 to win. Best nomenclature went to fourth placed Sue Coy of the Freebird club flying a Lusty Lady A/2 (Ian Elton Drew design).

The near calm at the contest close had become a light breeze by the time the fly-offs were organised. A change in wind direction also prompted a move of control to the southern corner of the airfield, with the inevitable delay as the whole 'caravan' that makes up a Free Flight Nationals re-located itself. The stage was set for some very exciting and meaningful fly-offs with only a 10 mph wind to worry the flyers in the cooling conditions. The drift was in a good direction with plenty of space inside the field and few obstructions outside. It was nice to see a good 'gallery' present for the final flights, including members of the general public, attracted by the spectacle and informed by Martin Dilly's commentary on the P.A. system.

The first fly-off was a combined Frog Junior, Vintage Duration and Tailless affair. In Vintage, Dave Hipperson's Lanzo Stick scored more than

the other three contestants added together! Things could have been different however as Gerry Ferer made only 19 seconds when his version of the same model — a winner in previous years — mysteriously stalled and spun in. Too many turns perhaps.

The Tailless fly-off was won by Russell Peers with John Pool in second place. These two flyers have had a running battle over the last four years with honours now equal at two firsts and two second places apiece.

The Open Power fly-off was next with fifteen flyers and 15 minutes to launch. The atmosphere was electric as the 'big guns' prepared to fire. One of the Super Nogs was up first with a climb that went slightly right and rolled inverted ... very high though. Stafford Screen blew a head and had to make a quick change ... his climb was good and on pattern but the Rossi powered lightweight FAI sized model couldn't match the .40 ships for sheer performance. Julian Hopper's .40 powered Super Jacker had a smooth but slightly slower than usual climb. The better glide could pay off and the air looked reasonable as the model drifted off downwind. Ewan Jones was more or less last to fly with a comparatively tame looking climb from his 1/2A model ... he must have contacted good air to gain third place. When the scores were in, Jeff Smith had avenged last year's defeat to win by almost two minutes while brother Tony had placed fourth in spite (or because) of stalling all the way down.

Glider was next and 25 lined up in fairly uninspiring conditions — there was not likely to be any real thermal activity by now and a little subtle 'help' was all that could be expected. John Cooper was up soon after the start and 'parked' his circle tow model in a holding pattern downwind on the runway. Arno Hacken circle towed up wind and released half way through the 15 minute period to score 3.11, but this flight didn't tempt John Cooper. Mike Fantham towed upwind to sample the air on the runway just downwind of the cars and the crowd.

There was a faint hope that these disturbances



Dave Greaves holding his Wakefield with which he won the FIB event. He had a total of 14:35, just seven seconds more than Mike Howick who came second.



Women's Cup winner Mrs. B. Tyson of Crookham, only entry to gain a full score.



would start something off and a little light lift did appear towards the end of the round. Mike catapulted off into this patch to be joined by Andrew Barr with Chris Parry slightly behind — Cooper was still not impressed but launched on his own about a minute after the rest had drifted by. Andrew's model made the best of the air, and John Cooper pushed Mike Fantham down into third place.

Open Rubber was the last fly-off and the hot favourite Phil Ball didn't disappoint his supporters. His magnificent 11.40 flight was timed right down to the horizon, giving sweet revenge for his sad luck last year. Laurie Barr made a rare outdoor appearance and a respectable 7.07 flight for second place which just goes to show that he can still put in the times, even if he is used to models about 100 times lighter!

It was good to see satisfactory fly-offs after last year's unfortunate timekeeping incidents. This time the organisers insisted that everybody had two independent timekeepers.

The day ended on a chaotic note when the planned rules seminar failed to occur at a local pub/restaurant. There was delay with the fly-offs and the food and, by the time a few beers and the odd chicken leg had been consumed, exhaustion and apathy set in.

On balance it was a good day's sport with fly-offs that gave a good comparison of model/flyer performance.

MONDAY — F.A.I. Classes Report by Martin Dilly

On the FAI day the first few rounds were damp, with quite heavy showers to upset C.G.s and test out the waterproof qualities of doped tissue. Even in the rain there was strongish lift, and this increased as the weather dried out and the moisture started to vapourise off the grass and tarmac. People flying gliders seemed reluctant to space themselves out along the launch line and there were at least two cases of models getting entangled in other peoples' towlines, hanging 20 feet up in undignified positions while being

lowered to the ground beneath another glider.

As is appropriate for Europe's largest model flying event, the '81 Nats had a leavening of international flyers. 1980 West German Wakefield champion Lothar Doring competed and used his chart recording anemometer-plus-thermistors system to score four maxes, only to miss the fifth after hitting a Mylar streamer at launch and being beaten by the hooter marking the end of the round on his reflight. His compatriot Gerhardt Wobbeking flew a neat Jedelsky-winged A/2.

The five rounds were divided into 45 minute periods for F1A and 45 for Wakefield and F1C combined. Inevitably, with rain discouraging flying at the start of some rounds, there were times when timekeepers were downwind looking for their own models instead of on the launch line timing in the following rounds, but problems seemed few. One of the unexpected ones came in one of the late F1B and C rounds, when thermalling aircraft were flying in and out of low cloud. Roger Baggott's Rossi model was just visible through 7 x 50s as it dodged in and out of the dangly bits below a large grey cloud forming in a strong thermal, but a jury had to be empanelled after a protest when a model was clocked before maxing invisibly in cloud and landing at about 6 minutes. Unfortunately for the flyer the rule books are quite clear about this, if the aircraft fails to reappear after ten seconds the watches are stopped and ten seconds deducted. If only all juries had such an open-and-shut case to decide.

Surprisingly, no fly-offs were needed in Wakefield and F1C, and occasional power flyer John Bailey of Biggles was the only one to max out in his class. Hard-working organiser Mike Coomes joined Dutchman Arno Hacken and 1981 A/2 team reserve man Mike Fantham in a 3-way fly-off in still conditions with a few spots of rain to add spice to the 15 minute thriller. Coomes released first, while Hacken and Fantham (towing with a runner, to call the time, sort out any problems used most of the fly-off to look for signs of rising air in the dead conditions.

Hacken favoured staying on the slightly higher

Top left: Ron Pollard at the moment of dismay, after hearing his last flight time had been clocked off, due to flying into a cloud for over ten seconds!

Above centre: Dave and Janine Rawlings ran their very popular junior workshop in the hangar, which gave a great deal of fun to the younger flyers.

Above: Andrew Barr gained his first SMAE win in open glider, just as his father Laurie had years before. Right: Wind Speed at the A2 fly off. Below: Trevor Payne getting ready for the open power fly off, gaining seventh place. He had better luck with 1/2A winning with a total of ten minutes.



ground near the launch line, but failed to find much lift, and landed roughly on the same level in the very variable wind direction, instead of gaining the height advantage Fantham headed for some brick huts and an area of tarmac near a road by the airfield boundary.

The variable drift led Mike to tow downwind in the hope of finding lift triggered by the changes in surface. With less than a minute left in the fly-off period he launched, his fatigue showing in the lack of acceleration into the zoom, and a resulting stall on release. Careful trimming during the weeks before the contest paid off, and the model made the four minutes even with a fractionally early D/T, to give Fantham his first U.K. win of 1981, and the Ronytube Trophy.

Overall Class Champions Glider

Chris Parry (Biggles) flew well in A1 to second place. Made a full score in Open Glider and came a creditable fourth and backed these up with a very creditable 16th in A2.

Power

Peter Harris (Birmingham) fifth in A.A. way down in Open Power after stopping on a duff flight but a fine second the next day in FAI made amends in the event that mattered. Trevor Payne with full scores in both A.A. and Open could have caught him easily if only he had carried on in FAI on the last day!

Rubber

Mike Howick (East Grinstead) ninth in Coupe d'Hiver, a full score in Open Rubber and a fifth place flyoff flight and a great 14.28 total in Wakefield to take second place in that event too.

Contest director and SMAE F.F. technical committee chairman Alan Jack coped admirably with the pressures of the entire three days in the hot seat, and was helped from time to time by others, both sub-committee members and competitors, who assisted with score recording and flight card distribution from the back of the now almost indispensable three ton truck. However, it was Alan who held the whole Nationals together and two whom all competitors owe a big thank you, next year we will be needing some new talents doing some of the work.

FREE FLIGHT RESULTS

Barkston Heath, 23rd- 25th May, 1981

Coupe D'Hiver (46 flew)

1. M. Chilton	C/M	10.00
2. M. Sanderson	Cleemac	9.34
3. G. Ferer	Leicester	9.22
4. D. Davitt	Leeds	9.06
4. J. Brookes	C/M	9.06
6. T. W. Gray	St Albans	9.05
7. R. Peers	Falcons	8.47
8. P. Carter	Croydon	8.23
9. M. A. Howick	E. Grin.	8.08
10. G. Neil	Anglia	8.06

A1 Glider (37 flew)

1. K. G. Smith	Croydon	9.11
2. C. Parry	Biggles	8.57
3. B. Lavis	Biggles	8.37
4. S. Philpott	Whitefield	8.36
5. R. Staines	Grantham	8.21
6. G. Brown	Wharfedale	8.15
7. G. Madelin	Crookham	8.14
8. J. O'Donnell	Whitefield	8.03
9. R. Woodruffe	Swindon	8.01
10. J. Bailey	Biggles	7.56

A Power (21 flew)

1. T. Payne	Biggles	10.00
2. M. Bull	C/M	9.55
3. J. Sayer	Darlington	9.22
4. R. Peers	Falcons	9.21
5. P. R. Harris	Birmingham	9.12
6. J. Fletcher	St Albans	8.58
7. M. Gregorie	Freebird	8.52
8. J. Godden	Leeds	8.20
9. P. Gibbons	Peterboro	8.00
10. G. Blair	Edinburgh	7.57

CO₂ Duration (23 flew)

1. S. Philpott	Whitefield	10.00 + 2.50
2. D. Hipperson	Croydon	10.00 + 2.39
3. C. Blanch	C/M	10.00 + 2.32
4. A. C. Gibbs	Birmingham	10.00 + 2.02
5. D. Goodwin	Vulcans	9.36
6. J. Pool	N.Y.F.F.G.	9.28
7. P. Ball	Grantham	9.15
8. S. Fielding	Morley	9.10
9. I. Dowsett	Croydon	8.30
10. R. Staines	Grantham	7.52

Hand Launch Glider (29 flew)

1. D. Edmonson	C/M	4.47
2. P. Ball	Grantham	4.32
3. J. Buskell	Crookham	4.31
4. B. Hunt	Huddersfield	4.19
5. J. Mayes	S. Bristol	4.15
6. P. Harvey	Nantwich	4.10
7. M. Page	Peterboro	4.05
8. A. Crisp	Biggles	3.53
9. P. Davis	Richmond	3.38
10. P. Buskell	Crookham	3.36

CO₂ Scramble (7 flew)

1. A. Tailby	Leicester	9.44
2. G. Brown	Wharfedale	9.15

3. I. Davitt	Leeds	8.22
4. D. Brown	Wharfedale	4.59
5. D. Eaton	Mkt. Har.	4.52
6. M. J. Coomes	Grantham	4.16
7. T. Auckland	Tynemouth	1.12

Vintage Wakefield (3 flew)

1. B. Aslett	Swindon	7.21
2. M. Sanderson	Cleemac	7.00
3. M. Staples	Shuttleworth	4.27

Open Rubber (44 flew)

1. P. Ball	Grantham	7.00 + 11.40
2. L. G. Barr	St. Albans	7.00 + 7.07
3. D. Neil	Anglia	7.00 + 6.59
4. R. Peers	Falcons	7.00 + 6.34
5. M. A. Howick	E. Grin.	7.00 + 6.32
6. D. Morley	Grantham	7.00 + 6.22
7. J. Cooper	Biggles	7.00 + 6.19
8. D. Hipperson	Croydon	7.00 + 6.09
9. M. Pressnell	St. Albans	7.00 + 5.52
10. J. O'Donnell	Whitefield	7.00 + 5.45

Open Glider (103 flew)

1. A. S. Barr	St. Albans	7.00 + 4.02
2. J. Cooper	Biggles	7.00 + 3.53
3. M. Fantham	Richmond	7.00 + 3.37
4. E. Tyson	Crookham	7.00 + 3.16

Open Power (34 flew)

1. J. K. Smith	B.A.C.	7.00 + 7.44
2. J. Hopper	Stanstead	7.00 + 5.53
3. E. Jones	Tynemouth	7.00 + 5.38
4. A. T. Smith	B.A.C.	7.00 + 5.33
5. S. Screen	Birmingham	7.00 + 5.14
6. P. Chapman	Freebird	7.00 + 4.47
7. T. Payne	Biggles	7.00 + 4.39
8. F. Chilton	Crookham	7.00 + 4.26
9. R. Monks	Birmingham	7.00 + 4.25
10. D. Reader	Birmingham	7.00 + 4.23

Tailless (5 flew)

1. R. Peers	Falcons	7.00 + 3.01
2. J. Pool	N.Y.F.F.G.	7.00 + 2.05
3. K. Attiwell	Calderdale	5.00
4. M. Page	Peterboro	3.54
5. S. Philpott	Whitefield	2.35

Vintage (23 flew)

1. D. Hipperson	Croydon	7.00 + 4.48
2. R. Moore	Biggles	7.00 + 2.09
3. A. Crisp	Biggles	7.00 + 2.02
4. G. Ferer	Leicester	7.19 + .19
5. J. Godden	Leeds	6.53
6. T. Chambers	Darlington	6.25
7. J. Mayes	S. Bristol	6.21
8. D. Neil	Anglia	6.18
9. B. Harding	Darlington	6.17
10. S. Philpott	Whitefield	6.06

Frog Junior (10 flew)

1. G. Neil	Anglia	7.00 + 4.02
2. J. Walker	Birmingham	7.00 + 3.04
3. S. Billam	Grantham	7.00
4. C. Parry	Biggles	6.50
5. M. Dove	E. Grin.	6.13
6. F. Mackay	Edinburgh	5.44

7. K. R. Amos	Biggles	5.31
8. N. Dixon	Birmingham	5.14
9. S. Dixon	Birmingham	3.12
9. T. Owens	Liverpool	3.12

Junior Kit Rubber (8 flew)

1. S. Billam	Grantham	5.56
2. R. Anderson	Tynemouth	5.45
3. A. Garbett		5.36
4. A. Ball	Grantham	5.35
5. N. Dixon	Birmingham	4.42
6. N. Moore	Biggles	3.47
7. L. Brookes	Grantham	2.49
8. M. Brookes	Grantham	1.12

Junior Kit Glider (5 flew)

1. F. Mackay	Edinburgh	5.12
2. S. Moore	Biggles	5.01
3. C. Miller	Croydon	4.34
4. W. Gilmore	Grantham	3.31
5. T. Auckland	Tynemouth	2.00

Women's Cup (4 flew)

1. B. J. Tyson	Crookham	7.00
2. A. Brown	Wharfedale	6.40
3. J. Nash	Anglia	6.25
4. S. Coy	Freebird	4.14

Wigan 70 (6 flew)

1. B. R. Peers	Falcons	4.30
2. J. Godden	Leeds	4.30
3. A. Abraham		4.25
4. J. Fletcher	St. Albans	3.52
5. J. Carter	Falcons	3.14
6. R. Sheene	Nantwich	2.04

F1A Glider (94 flew)

1. M. Fantham	Richmond	15.00 + 4.00
2. A. Hacken	Holland	15.00 + 2.37
3. M. J. Coomes	Grantham	15.00 + 1.39
4. E. Drew	B&W	14.46
5. L. Rogers	Swindon	14.42
6. M. Gregorie	Freebird	14.39
7. B. Baines	R.A.F.M.A.A.	14.27
8. J. Carter	Falcons	14.05
9. A. Cordes	Whitehead	14.00
9. C. Edge	Welland	14.00

F1B Rubber (41 flew)

1. D. Greaves	B&W	14.35
2. M. A. Howick	E. Grin.	14.28
3. N. Beaumont	Croydon	14.00
4. I. Keynes	Croydon	13.46
5. M. J. Woodhouse	Watton	13.37
6. R. Pollard	Tynemouth	13.36
7. G. Foster	R.A.F.M.A.A.	13.32
8. D. Morley	Grantham	13.29
9. P. Ball	Grantham	13.21
10. F. Sharp	Croydon	12.48

F1C Power (17 flew)

1. J. Bailey	Biggles	15.00
2. P. R. Harris	Birmingham	14.43
3. R. Garner	Birmingham	14.07
4. K. Faux	Freebird	13.45
5. S. Screen	Birmingham	13.39
6. R. J. Taylor	E. Grin.	13.29
7. F. Chilton	Crookham	12.56
8. H. Hutchings	E. Grin.	12.06
9. R. Baggott	Birmingham	12.00
10. J. Sayer	Darlington	10.02

TOPICAL TWISTS

by Pylonius
Illustrated by Sherry

LOST CONTINENT

What has happened to the Great American Dream? Some of us oldies were brought up on American style aeromodelling. Back in the early days, before model flying became a popular hobby, it was a lot of building for very little flying using such improbable materials as spruce, birch, wire outlines and oiled silk coverings. Generally you needed four general motors, each with six strands of $\frac{1}{4}$ in. square rubber, just to make 20 seconds of flight. And that was on a good day — mostly the gears ripped out after 100 turns. Thus, we simpletons who had tackled nothing more complex than a paper aeroplane looked to the American way for the easy-to-do-it approach with balsa wood, tissue and the single skein of things. It was fantastic — all done with a tube of glue and a razor blade on the kitchen table, too!

Maybe the models were not all that aesthetically pleasing, but who worried about the spindly looks when you could get a whole minute of flight? And what raptures when you caught one of those new fangled devices called a thermal. Given luck the cross country trip of your model would get a write up in the local press. What is more the model always came back. Unlike today, when any model leaving the flying field falls prey to gangs of thieves and hooligans; back in those gentlemanly days the model was invariably found by some highly civilised being, inevitably referred to in the press report as Mr. So and So of So and So who was surprised to find etc.

We in this country gradually shook ourselves from our medieval lethargy to join in the fun of the new style model flying, but it was always America that led the way, at least for us. They not only showed us how and what to fly but also how to run our model clubs and what to call them. Thus we became the Hoxted Balsa Bashers, the Wigan Cement Squeezers, the Nuneaton Nimble Nudgers — not to mention Thermaleers, Dope Fiends and the like. Not only that we went in for other transatlantic foibles like funny hats, tee shorts suitably ornamented, and even called our models crates.

But all that seems to have vanished. All we hear nowadays of American model flying is a bit of torrid activity in the gritty discomfort of some outlandish desert. All the goodies that at one time flooded in from across the Atlantic now come from the inscrutable East. From Hong Kong and Japan flood in the kits, radio gear and engines. Curious, since in neither land is there anywhere to fly model aircraft. Impossible to do so in Hong Kong without chipping a skyscraper, and in Japan there is nothing between the model aircraft and motor factories and the mountains.

Which raises the question? Apart from the desert do they fly model planes in America at all, or have the bureaucrats, the legislators and the conservation lobbyists put an end to it all? Usually we follow America in most of their lifestyles some 15 to 20 years removed. And, although model flying is grudgingly permitted in this country, it cannot be long before it is stopped altogether. Perhaps this fate has already overtaken our American friends.

PRIZE IDIOCY

One of the fastest growing industries today is that of award presentations. Every day, in the Press or on television, some organisation or other is handing out the Best What-Not of the Year Award to some personality or another. It is not so important what the person has



done so long as he or she is well known enough to warrant it. For lesser personalities there is the Best Supporting What-not or the Year Award, but who, nevertheless, qualify for the same crummy, standard trophy.

Somewhere along the line we modellers seem to be missing out. Instead of the bright new style hand-out we are stuck with the same old annual dinners and prizegivings, where the same tired old trophies are handed out in the same old formal way. Most of this ancient hardware, battered and tarnished, and first competed for when the only difference between a model aircraft and a kite was the bit of string hanging down, is embarrassing to everyone, not least the recipient. ("We're not having that monstrosity stuck on top of the television, nor on the hi-fi either — it's bad enough having the cat on it...").

The highly dentable silverware is also an embarrassment to the club or society who each year have the nail biting job of collecting it all in for a repeat hand out. Mostly people put the things away in some remote spot; so remote that they cannot find it the following year. On the other hand there are always new pots to replace them; people looking for immortality find the sporting out of a few quid for a bit of donatable tinware a surer bet for keeping the old name eternal than anything the Pharaohs ever thought up. Thus, when all the great luminaries of their day are forgotten — the winners of countless contests, the builders of whole squadrons of superb models, and celebrated designers — old Joe Bloggs' name will go marching on, glorified in that annual glider event, even though there may be only two entries (one flew).

At least in one particular area we have something of an advantage in staging a personality show, in that in recent years we have come up with some of the most hideous trophies the wit of man could devise. These are only equalled in hideosity by the sort of things you see being handed out on television. Just think of the success of a hand out of a truflow propeller embedded in perspex or a silver plated bubble machine. And what about a most hideous trophy of the year contest?

CUT TO CAMERA ONE

Looking at the preliminaries to the Cup Final on TV, I was struck by the scrupulous care with which the programme presenters shielded the great British public from the horrors of one of the preliminaries to the Great Match, I am referring, of course, to the model flying display. The cameras swooped around the arena even more deftly than the models, skillfully evading most of the models to settle on such edifying manifestations of the national sport as mass banner waving and caged human beings.

However, I was gratified to see one spirited combat flyer taking on the camera to get in a few shrewd passing cuts, sufficient for me to conclude that the subsequent football match would have made a passable introduction to a display of model flying.



GETTING TO GRIPS WITH GLOWPLUGS

by
John Stroud

I AM FREQUENTLY asked that age old question by beginners — "Which is easiest to use, a diesel or a glow plug engine?" After years of being involved with learners I think I must say glow plugs are easier but with a few reservations. These are

1. There are difficult-to-start glowplug and diesel engines which should be avoided by the beginner.
2. For economy of operation the diesel wins.
3. Worn out engines of both types are nearly always difficult to start.
4. In experienced hands, neither type usually present problems.
5. Glowplugs are only easier if used with a good glowplug battery.

In point 2, on economy, I am not thinking about the fact that glow engines are a little more thirsty on fuel — both use so little in the smaller engine sizes it does not really matter. What does take some new glow plug owners by surprise is that having spent their last £10 on a nice new little engine, they then need to spend more than that to get it started! The usual solution offered by a model shop is a lead acid cell and a charger costing at least £10 for the two items. In this article I shall suggest less expensive solutions and explain some of the things about glow engines which sometimes confuse the newcomer.

The first thing one notices about a batch of various glow engines is that some have glow heads and some have glow plugs. Glowplugs can be removed from the engine head and look like very small spark plugs. Glow heads have the 'plug' built into the

cylinder head and it cannot be removed separately. The latter are used on smaller engines by a few manufacturers. The big difference as far as the operator is concerned, is that glow heads are a little dearer and one is stuck with the type supplied by the manufacturer. With glow plugs one has a choice of a number of types with different characteristics. Built into both glow plugs and heads is a tiny coil of wire which needs to glow brightly like an electric fire in order to start the engine. The temperature at which the correct glow is obtained is very critical. Too hot and the coil burns out, while too cold and the engine won't start. Dull red is too cold and a yellowish white is too hot. Bright red is the correct colour.

When you have organised yourself with a good battery of the correct type, take the plug or head off the engine and take a careful look at the correct glow. Also note the length of thread on your correct plug as they are made in two sizes — long and short. If in doubt take your old one along to the shop when buying a new one. Because the correct glowing temperature is critical, each plug or head is made for a fairly narrow range of voltage supply. All the glow heads I know and many of the glow plugs are designed to work off no more than 1.5volts. This means the supply must be either a dry cell of 1.5volts or a Ni-cad of 1.2 volts. The other supply one can use is a 2 volt lead acid cell but unless one uses a dropper lead, a 2volt supply can only be used with a 2volt plug. The merits of the various types of cell are:

Alkaline Cells A 1.5volt type D cell of the

disposable type. Current price is about 70p or 80p each and this makes them the cheapest starter battery to buy. I have recently tried these cells and provided they are used for only a few seconds for each start they give a very reasonable life. On a continuous 'burn', a new *Duracell* I tested gave a good glow on a Testor head for 1½ hours. I feel sure some others I have used did not last as long as this.

Zinc Dry Cell These again are 1.5volt disposable cells and are the conventional dry cell. In the small sizes these are no good for starting engines but in the large size they are a good short term solution. I have one known as an AD4; it has been in use on and off for over a year. At a cost of about £1.50 they work quite well although I have not timed one to see how long it will last.

Nickel Cadmium Cell (Ni-Cad) These cells are a 1.2volt rechargeable type. The smaller sizes are used in R/C outfits but there are also available 4000mAh ones of the 'D' size, which are ideal for glow engines (NB — Not all 'D' size Ni-Cads are 4000mAh). When on load they hold up their voltage very well and will start a 1.5 volt glow and even some 2volt ones — albeit rather reluctantly (some special 1.2v plugs are available now for use with Ni-Cads). I timed one on a Testor glowhead, which takes about 2 Amps, and it burned well for two hours and ten minutes! Encouraged by these results I built an ammeter and a dropper bulb into a small wooden box. It has proved to be a very handy little starter which I can charge from a 12v DC supply. The ammeter is not essential but is extremely useful to avoid frustration and wasted time.

Lead Acid Cell These cells can be recharged and give 2.2volts. If connected with a normal lead to a 1.5volt plug or head, it will burn out instantly. However, with about 8ft of thin bell wire used as a lead, the voltage drop is enough to only give 1.5volts at the plug. (Experiment with a charged battery and a piece of bell wire too long. Shorten the wire until it gives a bright red glow). As a long term solution the lead acid cell is probably the best because it is rechargeable and will start 2 or 1.5 volt engines. The cost of one in the shop is about £5 to £8 and about the same for a suitable charger. I do not buy my lead acid cells but instead cut one cell off a recently discarded car battery.

As these cells contain sulphuric acid you should only attempt this job if you know what you are doing. Beware of the ones with a lot of soft pitch on the top as it gums



Left: various commercial glow plug clips and below an individual plug on the left with an integral cylinder head and plug on the right.



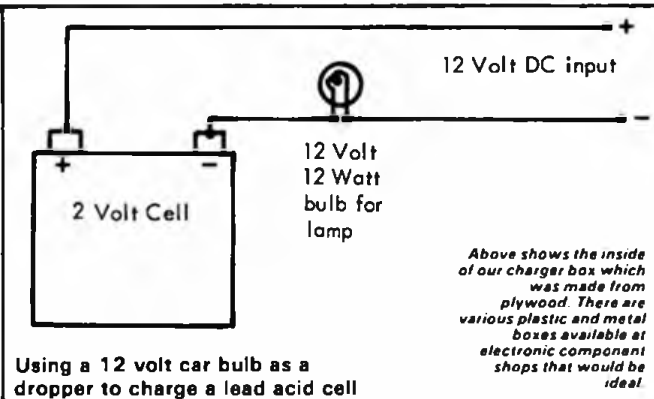
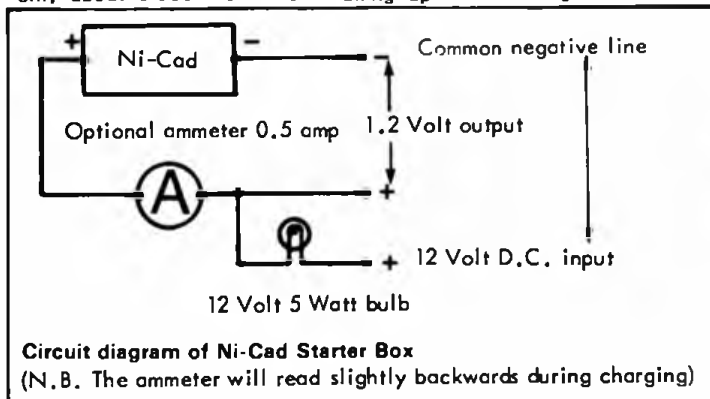
Aeromodeller

up the hacksaw. The cost of a special charger can be avoided also if you can get the use of a car battery charger. By using a car bulb as a dropper, the charging rate can be adjusted to suit the battery. Roughly speaking a 12volt 6watt bulb will give just less than 1/2amp, a 12volt 18watt bulb will give just under 1 1/2 Amps and so on — divide the voltage into the wattage on any 12volt bulb and the charging current will be just less than the answer.

I have already mentioned making up a dropper lead for starting 1.5volt engines with a 2volt cell. The resistance required is only about 0.35ohms. When making up

expensive and in some engines is just a waste of money. Find out how little suits your engine and stick to that percentage.

At the risk of repeating myself from previous pieces I have written, I will again emphasise the importance of mounting an engine properly for bench running. Some of the awful mountings cobbled together by the boys I help have been a serious injury risk to the engine and its owner. Soft wood, thin plywood, sheet metal and nails are all no good. Tough hardwood, such as beech plywood at least 6mm thick and bolts and screws are essential unless a commercial mounting is used. I have a Davies Charlton



normal starter leads the last thing you want is to introduce any resistance near this value. Poor connections can easily drop 0.1 volts and three or four connections like that makes starting difficult. Therefore, when making up leads, involve as few connections as possible and always use tags and soldered connections. I found my ammeter alone drops 0.1 volts and had to use thick wire and short leads to avoid losing any more voltage.

Available in the shops are a number of glow clips. Some are not suitable for small engines and others cannot be used on glow heads. Take your engine along when you buy a clip and make sure it fits. As a last resort, one can use a pair of small crocodile clips. To help avoid accidental shorting, clip one of the clips to the other clip's wire — if you see what I mean.

Having sorted out a good battery for your glow engine, the other item you will need is the correct fuel. Of course the best advice to follow is that of the engine manufacturer if that fuel is available locally. The main difference in most of the 'brews' available is the percentage of nitro methane it contains. Straight fuel with no nitro-methane is often used for running in and for economy of operation in many engines of moderate performance. With some engines about 5% nitro will improve running and make for easier handling. Providing the engine is designed for nitro, useful gains in power can be obtained using 10%, 15%, 20% or even higher proportions. Most people use about 5% nitro for sport flying although some smaller high performance engines refuse to run properly unless fed on about 15%. Nitro methane is

mount screwed to the remains of an old table. For prolonged running I can take it out into the fields well away from neighbours who might be annoyed by the noise. It is also necessary to mount the fuel tank properly. If it comes loose during running it can make an awful mess, so make sure it is well tied down. The other important thing is to place the tank on the same level as the spray bar. If the tank is too high it causes flooding and if it is too low the fuel runs back from the engine into the tank.

The final stage now is to get the engine running. With the engine and tank mounted securely and held in a vice, fill up the tank. Priming the engine can be done in two ways. Most glow engines respond to a few drops of fuel being put through the exhaust port onto the top of the piston. Providing one does not put in enough to put out the glow, a few smart flicks after connecting up the battery will make the engine fire. Always disconnect the battery whilst priming or it might catch on fire. If it does not continue to run, it is likely that either the needle valve is not open enough or the fuel is not yet filling the pipe to the engine. For the latter problem you either have to prime and try again or, if you can, put a finger over the air intake and turn over the engine to draw the fuel along the pipe. Choking or priming too enthusiastically is a sure fire way to flood an engine. You can recognise a flooded engine after experience by the sloppy plopping noise it makes, droplets of fuel coming out of the exhaust and, easiest of all, the reading on the glow plug ammeter will go up by as much as 1/2 or even 1amp. To clear a flooded

engine you can shut off the needle valve and/or blow into the exhaust port before carrying on with more flicking. If the engine bursts into life, speeds up, then dies, it is usually too lean. Open the needle valve half a turn and try again. If the motor starts and then slows down, perhaps ejecting droplets of fuel, the motor setting is too rich. Close the needle valve half a turn and try again. It is this simplification that makes a glow motor slightly easier to handle. Without the complication of the diesel's compression setting, a glow engine is either too rich or too lean if it runs and then stops. Glow plugs do burn out but that is very rare on the correct voltage. Once you have got the engine to continue to run whilst connected to the battery, let it warm up for a few seconds and listen to the engine note. If it is fairly fast and smooth, try disconnecting the battery. An engine running very rich will stop at this point. Close the needle half a turn and start again. Brand new engines should not be run at full speed to begin with so do not close the needle valve enough to get a fast run until the engine is run in.

Each engine responds to a slightly different starting technique so experiment with different methods if you are having trouble. Some like to be wet whilst others prefer to be dry. My G-Mark .06 likes a slow lazy flick and to be fairly wet whereas the Cox Baby Bee likes the exact opposite. Hot engines are often difficult to start as are worn engines. Hot, worn engines can be impossible. Large propellers make starting much easier whilst sorting out an engine but put on the recommended size for flying.

The most common cause of failure to start a glow engine is a poor battery.

Vintage Corner

BY ALEX IMRIE

Pre-War Elf petrol engine

THIS ENGINE emerged from the early experimental small bore engines begun as early as 1932 by Dan Calkins of Portland, Oregon. Because of its unusually small size for the time it was aptly named the Elf and over the next few years was subjected to an extensive testing programme which included much flying in small light airframes. Dan Calkins knew that he had a winner, and formed the Elf Engine Company to undertake series production of

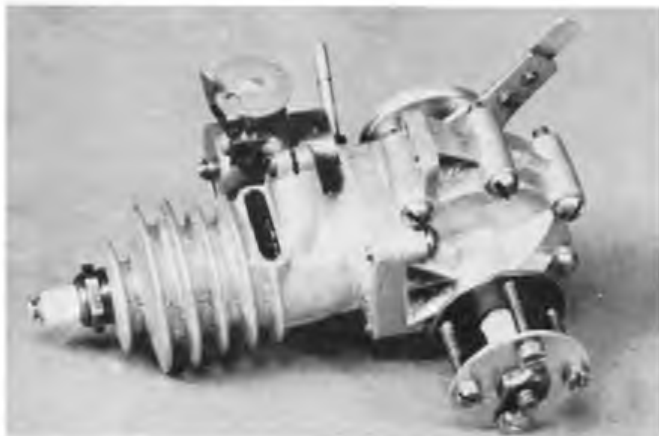
the market and Elf sales suffered accordingly, the situation deteriorated further during 1938, and in 1939 production of this fine little engine was discontinued to make way for a completely new model which came out in 1940. This engine was followed by various twins and flat fours until the final Elf engine appeared in 1950, this being a flat six with glowplug ignition.

The cylinder of the original Elf was fitted with a thin steel liner and had a bore of 0.542in. The stroke was $1\frac{1}{32}$ in. and the capacity 2.25cc. The bare weight of the engine was 4oz., and with coil, condenser, two pencil batteries, fuel tank and propeller, weighed 8oz. ready to install.

Dan Calkins has said that he could have made the engine even lighter than it was, but rather than sacrifice strength, he beefed up the sandcast aluminium cylinder and crankcase to stand up to the worst sort of crash. The crankshaft, mounted in two separate brass bearings, was turned from the solid and fitted with steel counter-

The engine was easily inverted by turning the curved intake tube with attached float chamber through 180 degrees. This caused the float chamber to be offset to the left side, however, for protracted inverted running a special inverted intake assembly was available that placed the float chamber directly behind the cylinder.

The contact breaker was of the automobile type, it was fitted at the rear of the engine, was completely enclosed, and the points were operated by means of a hardened cam and cam plate. A one piece sparking plug ($\frac{1}{4}$ in. by 32tpi) weighing $\frac{1}{10}$ oz. was fitted. This was made by Elf but the ceramic insulator was specially supplied by the Champion Spark Plug Company. The seat for the plug was machined on the cylinder head so that no gasket was required, also it was sufficient to merely finger tighten the plug! The $1\frac{1}{2}$ volt coil was without doubt one of the most highly rated ignition components of



Two views of Elf engine serial number 52 from the production line, by Dan Calkins

this engine in late 1935/early 1936.

It was the first really small petrol engine to become commercially available, and such was the local enthusiasm for it, that many West Coast modellers wanted the Elf, which, priced at \$21.50, was the same as that of the well-known Brown Junior. This demand completely swamped the limited output of the production facilities, and as a result, there was no need to advertise the engine or offer it for sale through dealers. Orders for the Elf were made direct to the factory and were filled in strict rotation. Soon there was a two month waiting list, a situation unheard of in the USA at this time!

As the backlog of orders was cleared some engines found their way over the border to Canada, and the Vancouver Model Aircraft Supply Company sent one of these to England in 1936 for C. E. Bowden. Polks Model Craft Hobbies Inc. became Elf agents in 1937, and by the end of the year the Scientific Model Airplane Company was in a position to offer immediate delivery. However, by this time there were cheaper, more powerful, small engines on

weights to balance the engine as completely as possible. The heavy frame and the very light reciprocating parts reduced vibration to a minimum. The piston and connecting rod were machined from aluminium castings, three piston rings were fitted and the gudgeon-pin was fully floating, being made from tubular steel. The internal finish was excellent, and the engine, being made to very fine limits, required careful running-in on the bench. The recommended fuel mixture was given as being between 8 to 10 parts white gasoline to 1 part of SAE 60 oil.

The carburettor, which was without any air adjustment, was of the simple single jet type, and was controlled by a needle valve with ratchet wheel, having the spray bar in the bottom of the intake tube, fed from a brass float chamber. The fuel level was kept constant in the float chamber by means of a balsa wood float-operated needle, the supply being via thin rubber tube from a remote fuel tank which had to be at least $\frac{1}{2}$ in. above the float chamber height in order to provide a constant reliable gravity feed.

the period. Although fully capable of operating the Elf engine ignition circuit satisfactorily on only one pencil, it was recommended to wire two of these batteries in parallel, when it was claimed the engine would run for $1\frac{1}{2}$ hours!

The Elf engine was supplied mounted on a stained and finished oak running stand, fitted to iron angle plates with coil and condenser attached and fully wired-up ready for running. Starting was easy, provided that the spark was well retarded, but the Elf was very sensitive to movement of both timer and needle valve until properly warmed up.

The engine was given power and fuel consumption tests covering its usual speed range from 3000 to 6000 rpm. Maximum power was found to be $\frac{1}{30}$ hp at 4700rpm, while the best fuel economy with resulting sacrifice of power was 2.8lb per bhp at 3500rpm. At this speed it was found that the Elf, driving the 12in. dia. x $6\frac{1}{2}$ in. pitch Chauviere type propeller provided,



"Flying Minutes" stream-lined parasol Wakefield designed before the war by Norman Lees and Len Stott of the old Halifax Club. This example by Derek Camps seen holding model



"All Weather Pat!" The OS60 powered Vulcan with its builder. This fine pre-war design by the late D. A. Russell looks and feels like a real aeroplane. Originally in 1939 it was powered by a 9.2cc Dennyrite "Airstream Deluxe" petrol engine.

developed a static thrust of 9oz. and would run for 40 minutes on one ounce of fuel.

SAM 35 speaks

Current news sheet number nine for May/June has been distributed to members and the main article is an interesting treatise on *Veteran and Vintage Rubber Models* by that maestro of the immediate post-war Wakefield scene, Ron Warring. Hopefully this will encourage the 'rubber ears' type of vintage modeller to dust off his building board and get cracking. Outer cover for this issue is a copy of a page from a 1935 *English Mechanics* which includes a GA drawing of a 10ft. span RUBBER model, this is a high wing cabin design by Mr. E. A. Ross and is called Rosignol. We would like to contact 'Bunny' Ross not only to ask him about Rosignol, but also to learn about his power modelling days in the late 1930s. Geoff Clarke contributes his usual chatty 'counter-talk' and apart from submitting a fine sectional side-view drawing of the Super Atom 1.47cc petrol engine has also included a GA drawing for Bill White's stream-lined pylon power model from 1944. This was, like many models of the time, a six foot span model powered by the Brown Junior Model B. Editor Ben Buckle has thoughts about that fine old Keil Kraft design the Junior 60, he is seeking to document this model as fully as possible and urgently needs the loan of an original plan of the very first version. That is the 1946 version... is it really 35 years ago? I remember Bill Turner who worked in Wade's Model Shop in Chambers Street, Edinburgh, making one, the plans only were available early in 1946, and it was not until late summer same year that the first kits were available; he might still have the plans, and be able to help out if this catches his eye!

A number of Junior 60 models have been built in sizes other than 5ft. span, and it is quite common nowadays to see CO₂, 1cc diesel, 5cc glow and 10cc petrol versions of the same design. This 'size war' seems to

attract the bulk of present day vintage modellers, so there is no doubt that it is popular. At the risk of being called a 'stick-in-the-mud' I must say that I do not hold with varying the sizes of models and prefer to build them in their original size, powered if possible by the correct type of engine. I know full well that my view is a minority one, maybe I am one of those Rip van Winkles I was writing about!

Third 1981 Flying Meeting at Biggleswade

There was a good turnout for this meeting on Sunday May 17th and models of all types were in abundance, unfortunately, yet once again the weather refused to co-operate and what flying took place was spasmodic due to strong wind and heavy rain. However, in the lulls

SAM Treasurer Peter Michel with his Peerless Panther one of the first successful low-wing power models to be kitted. It was powered in its original form in 1940 by spark ignition engines like the Ohlsson 23.



between showers many enthusiasts did get their creations airborne.

Pat Mardell came equipped to do battle against the elements and his OS60 four-stroke powered Vulcan was in the air off and on during the whole afternoon, even in the heaviest showers, thus providing a good example of the value of radio controlling a vintage design in severe weather conditions. Noel Barker's Miss Philadelphia VI was sporting its third mainplane, this one made in two halves for ease of transport of its 96in. span. The rain was so heavy at times that Noel got inadvertent shock treatment every time he tried to adjust the needle valve! Eventually, following a heavy landing that the telescopic tube undercarriage legs took in their stride, the model shed its wing, and the fuselage, bouncing on vintage 4in. dia. ZN airwheels, propelled by the screaming twin-plug Super Cyclone spark ignition engine, went grass cutting! Peter Fisher's Club Conquest (illustrated in this column last month) took to the turbulent air a number of times, but the characteristic healthy crack of its May Rocket engine (serial number 21) was always prematurely stilled by the ingress of moisture.

If the spark ignition men experienced trouble with soaked HT leads, no such problem beset the diesel brigade. Outstanding models that flew well in the atrocious conditions were John Kaye's Frank Ehling Flying Stick (ED Competition Special), Peter Michel's Peerless Panther (Mills 1.3cc Mk I) and Bill Langley's Halifax Rapier (Mills 1.3cc replica). Peter obviously took my hint about the lack of ROG facilities and produced a canvas trampoline cover, which, when pegged to the ground provided the first take-off 'board' seen at Biggleswade. He used this runway to good effect and his model was rapidly taken-off the canvas by the 12x4 in. propeller that the Mills diesel swung without complaint. After a number of short flights Bill Langley 'gave 'er the gun' and paid for his sins when later he was unable to find his model down-



John Kaya threw caution to the winds when he test flew this Frank Ehling design in the storm conditions at Biggleswade.

wind, he did not have his name and address on the Rapier either... we have all done it sometime or other... but let this be a reminder to us again that even vintage models can fly away on occasions.

The usual bout of hangar flying ensued, during which the writer was pleased to demonstrate Mr. L. S. Wigdor's Elf petrol engine (serial number 52) operating on a hand held block to an admiring audience. The ease of starting and the smoothness of running obviously made a great impression with the enthusiasts, this engine truly being 'a thing of beauty and a joy forever'. Many thanks to Wiggie for making this pleasurable occasion possible.

Book Reviews

Two foreign language books on model engines are examined this month, both have sizeable portions of interest to vintage engine enthusiasts and it is in this context that they are reviewed here.



Modelářské Motory by Jiri Kalina, published by Nase-Vojsko-Svazarm, Prague, Czechoslovakia. Available from both Michael's Models and The Aviation Bookshop (Beaumont). Note that price can vary and delivery can be irregular.

A history of the model internal combustion engine, this book contains much information on vintage motors, but its references relate mainly to Eastern European engines. Since most readers will not be able to read the text, the value of the book must remain as an identification aid or catalogue for foreign engines that are often difficult to identify. There are some 205 illustrations, and these include two-view drawings of some early American engines

including the Baby Cyclone and Ohlsson Miniature, as well as photographs of early German motors including the Ortus 5.8cc engine.

The similarity of the Russian AMM-3 to the Brown Junior, as well as the many engines like the Letna and the Ipro-Ikar 6.3cc motors whose designers were obviously influenced by the Baby Cyclone make very interesting comparisons. I recommend the book to serious model



engine enthusiasts, and if you can understand the language, this book becomes a 'must'.

Das Grosse Modell-Motorenbuch by Roland Schwarz, published by Verlag für Technik und Handwerke GmbH, 7570 Baden-Baden, West Germany. Price DM29.50. Obtainable direct from the publisher (post free) at DM34.50.

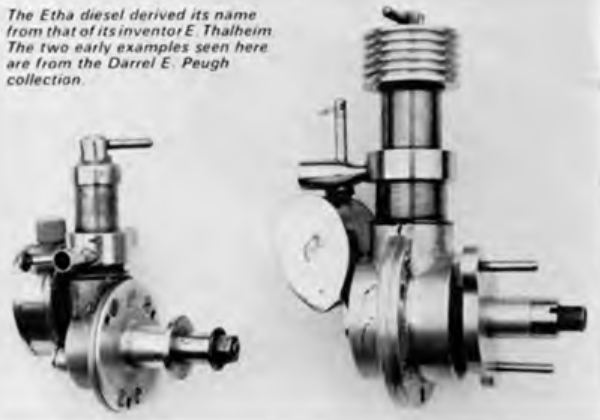
This is a fine book and Herr Schwarz is to be congratulated on his expert treatment and coverage from first principles to detailed descriptions of current engines both commercially available and rare home-built examples. Apart from single cylinder engines of both two-stroke and four-stroke varieties, types covered vary from flat, vee and tandem-twins, via wankel types to a nine-cylinder four-stroke radial based on the full-size BMW aircraft engine.

While the development of model engines is covered briefly by descriptions and illustrations of the well-known Brown Junior, there is excellent coverage of the early German petrol engines, and Kratsch, Kratmo, Eisfeld, Ikarus, Felgiebel, Famulus, Hauesler and Flottweg are all illustrated. However, it is the information on the invention of the model diesel engine that 'steals the show' and this story alone is worth the price of the book!

Here for the first time is the breath-taking revelation that an application for a patent was submitted to the Swiss Patent Office for the model diesel principle as we know it, with variable compression via a moveable contra-piston, as early as 31 December 1927 by a Herr Ernst Thalheim. The book contains a copy of the patent number 129373 issued to Ernst Thalheim on 17 December 1928. Unfortunately only the

text part of the patent is given, it would have been very interesting to have seen the drawing that was part of Thalheim's submission to the authorities. Thalheim apparently did not produce his engines in any number, and after the demonstration of his Etha motor at the inventors' fair at Basle in 1928, he only made a few engines to special order. The exact number is not known, but 12 different versions were said to have been made, some of them of twin-

The Etha diesel derived its name from that of its inventor E. Thalheim. The two early examples seen here are from the Darrel E. Peugh collection.



cylinder layout, and one of his last engines made in 1939 looked like a Brown Junior with a contra-piston lever on the cylinder head.

These engines were distributed by Hoppeler of Zurich and Thalheim appears to have completely stopped making engines sometime in 1939. It is indeed coincidental that another Swiss, Herr Klemenz Schenk, entered the scene about the same time as Thalheim terminated his work. Schenk's experiments in 1940 with compression ignition fuels resulted in the appearance of the Dyno diesel, which was tested by the Swiss aviation authorities in June 1941. At this time the protection of Thalheim's patent was still binding, and one can only assume that the reason why Thalheim did not take legal action against Schenk, was that he wanted to be spared the trouble and certain expense of the court case. It is not known whether the emergence of the Dyno in June 1941 was a parallel discovery of the model diesel principle, or that Schenk did in fact know of Thalheim's work as the maker of the Etha motors, but there is strong evidence to suggest that the latter is true. Be that as it may, there is absolutely no doubt that the inventor of the model diesel principle was Ernst Thalheim and the documentary evidence in this book will ensure that he receives proper recognition from now on.

Das Grosse Modell-Motorenbuch is well illustrated throughout with 262 excellent photographs and drawings, the book is good value in this day and age, even at the rates of exchange that we have to live with. I heartily recommend it to all engine enthusiasts, and end by expressing the hope that the book might yet appear in English.

OUR LOCAL PUBLIC TV station is currently showing 'Flambards,' and as I somehow missed this series on its first go around, I've been watching it avidly. So when I recently began to sketch out a CO₂ model for some summer evenings' flying, a vintage look appeared quite naturally.

The model was built over a weekend, and proved to be anything but vintage in its flight performance. In general the flight trials went very well, and 'Little Willie' turned out to be most satisfactory. If you are interested in a model which will provide an entertaining flight or two, before or after dinner, try this one.

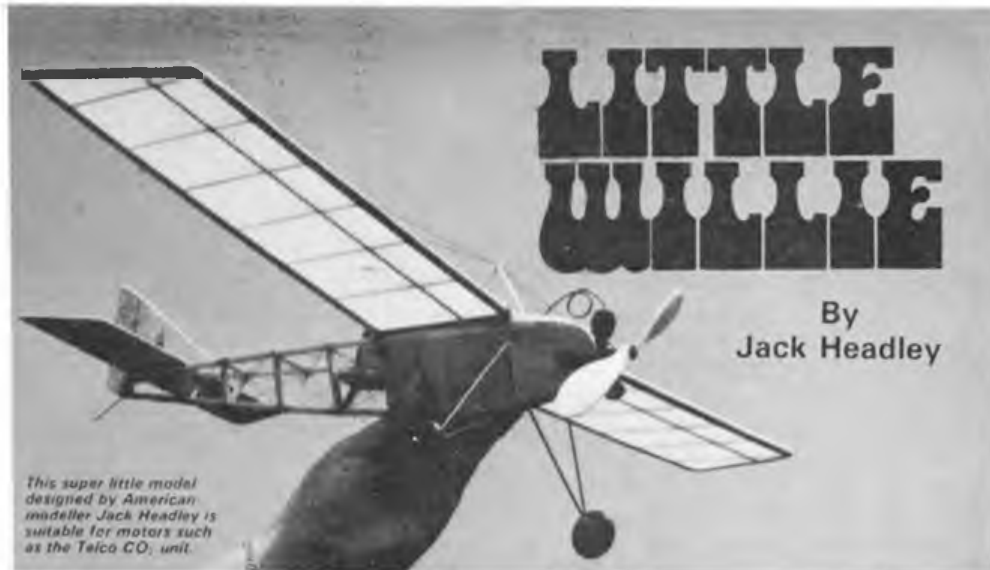
Construction

The fuselage is basically a triangular structure, made from $\frac{1}{8}$ in. square strips. Begin by making the crutch, which is also the top surface, directly on the plan. Cut out Frame 'A' which is shown in Section A-A, and cement this to the crutch. The $\frac{1}{8}$ in. square keel is the next item, and this is glued to frame A and the $\frac{1}{4}$ in. square tailpost. An intermediate support is required to hold the keel in its correct curvature, and this can be placed at the station just aft of frame A.

All the $\frac{1}{8}$ in. uprights are cut and glued into place now. Note that the keel piece stops at frame A, and the highly curved front keel is simply cut from $\frac{1}{8}$ in. sheet. This item can be made and attached now, as can the $\frac{1}{2}$ in. ply engine mount.

After removing this structure from the plan, and sanding all the glue spikes off the wood the $\frac{1}{32}$ in. sheeting is added between frame A and the wing trailing edge. Now is the time to attach the undercarriage, so we'll stop work on the fuselage for a while.

The true lengths of the U/C wire legs are shown on Section A-A, so the first job is to bend up two pieces of 18swg wire to these shapes. Bind a strip of hard $\frac{1}{8}$ in. square balsa to the main legs, as shown on the plan. Cement and push it into place at the front of frame A. Solder the cross brace



wire to the main leg, note that the apex of the cross brace rests in a notch cut into the $\frac{1}{8}$ in. sheet keel. A further strengthening of the U/C is made by binding this lower joint with thread, and smearing this with a little epoxy. The wheels are added after the model is completed.

The wing supports are made from $\frac{1}{8}$ in. square, tapering to a point at the wing TE use soft balsa for the forward fuselage top surface, carve and sand to shape.

Tailplane and fin

These are both made from $\frac{1}{16}$ in. sheet, and cemented to the fuselage.

Wing

The plan shows both wings, the left panel being drawn with solid lines, and the right wing dashed. Build both these panels completely except for the centre ribs, then join together with the aid of the wing joiners W1, which are cut from hard $\frac{1}{16}$ in. balsa sheet. After sanding all over the $\frac{1}{32}$ in. sheeting can be applied in the centre section, (but don't forget to add the root ribs first).

Cover the wings with lightweight tissue,

water shrink then apply a couple of thin coats of clear dope. The $\frac{1}{16}$ in. dowel king posts are the final item, and these are cemented into $\frac{1}{16}$ in. diameter holes drilled into the centre wing panel.

Finishing touches

The two fake cylinders glued onto the outside of the cowling were carved from soft balsa.

I noticed in Flambards that most of the aeroplanes were finished in a very plain manner, so I used the same approach on Little Willie. The wings were covered with white tissue, and all the other parts of the model were left as plain balsa, with a couple of coats of clear dope applied. The cowling was painted with dull aluminium dope, then the engine cylinders were doped red. Panel joints, rivets and wood screws were 'suggested' on the body with a black ink pen.

Use black thread for the fuselage bracing. The bracing thread provides torsional rigidity to the rear body. Coat the thread with clear dope. The wing bracing is however for effect only, and is simply cemented on the tissue and to the top of the kingpost.

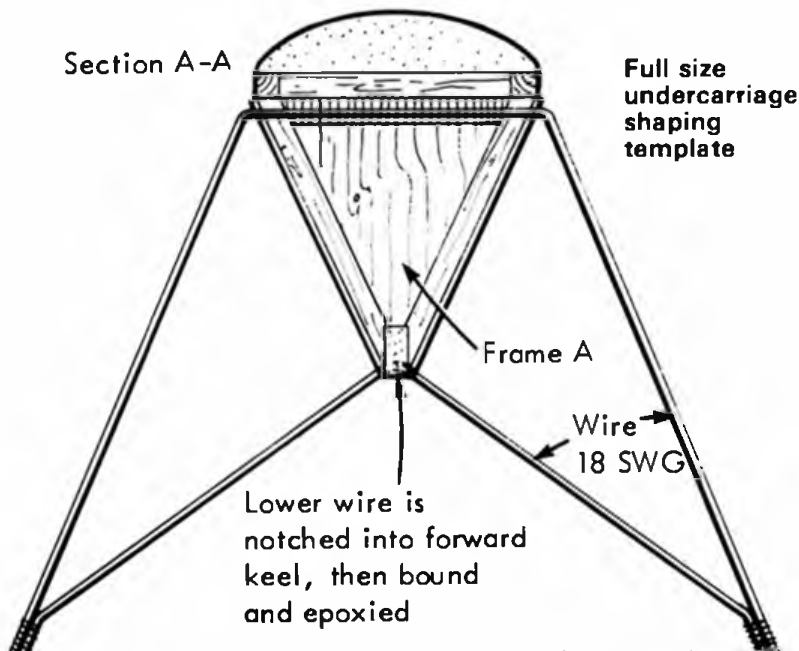
Motor installation

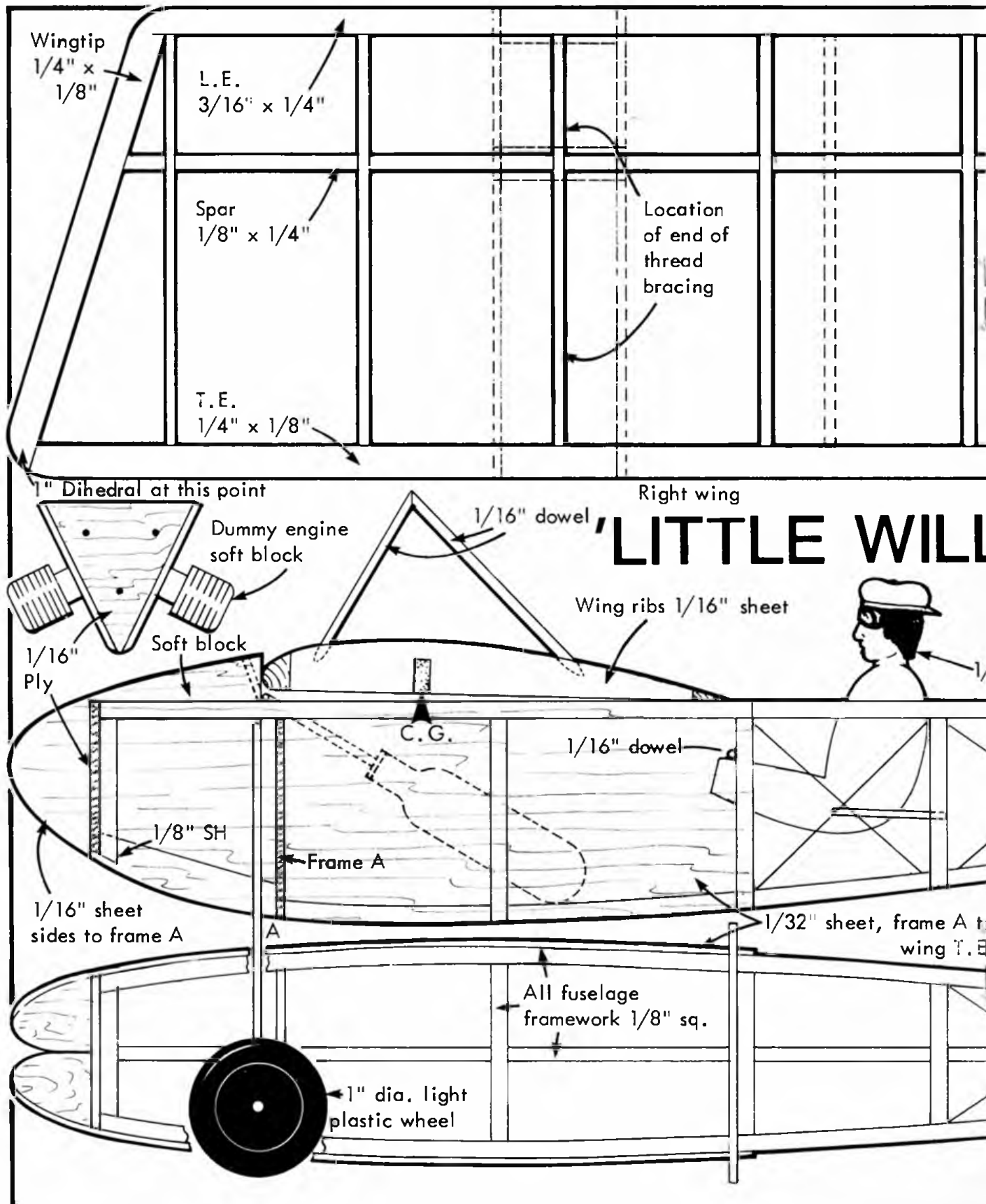
My system here is to first throw away the fiddling little nuts and bolts provided with the engine, and substitute small sheet metal screws ($\frac{1}{32}$ in. x $\frac{3}{8}$ in. are about right). The engine is then screwed to the ply frame, and the gas tank angled into the body as per plan. A small notch in the block fairing makes a passage for the tubing. The filler is run out of a notch in the wing runner.

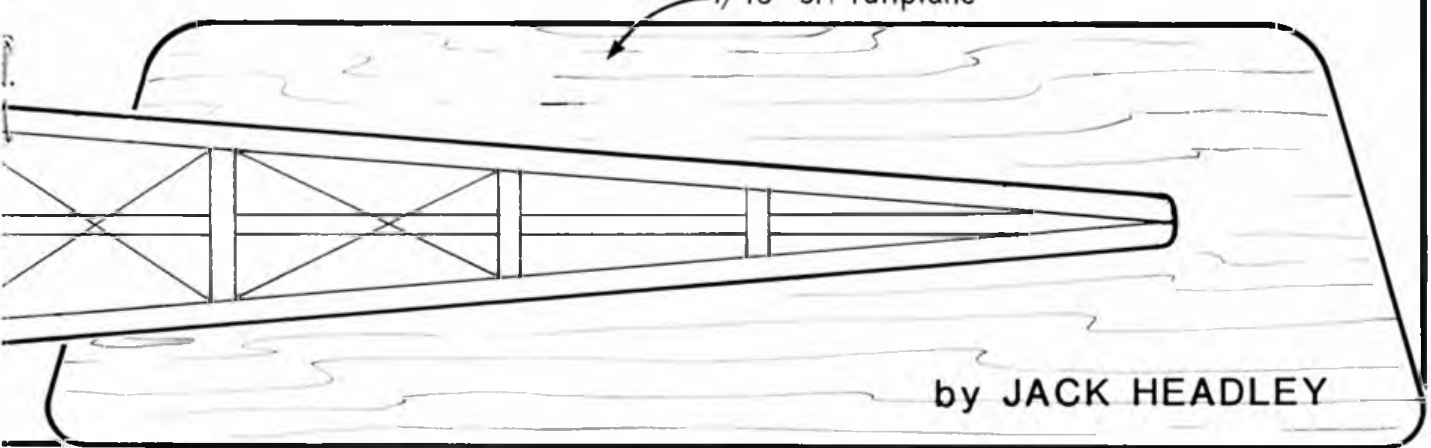
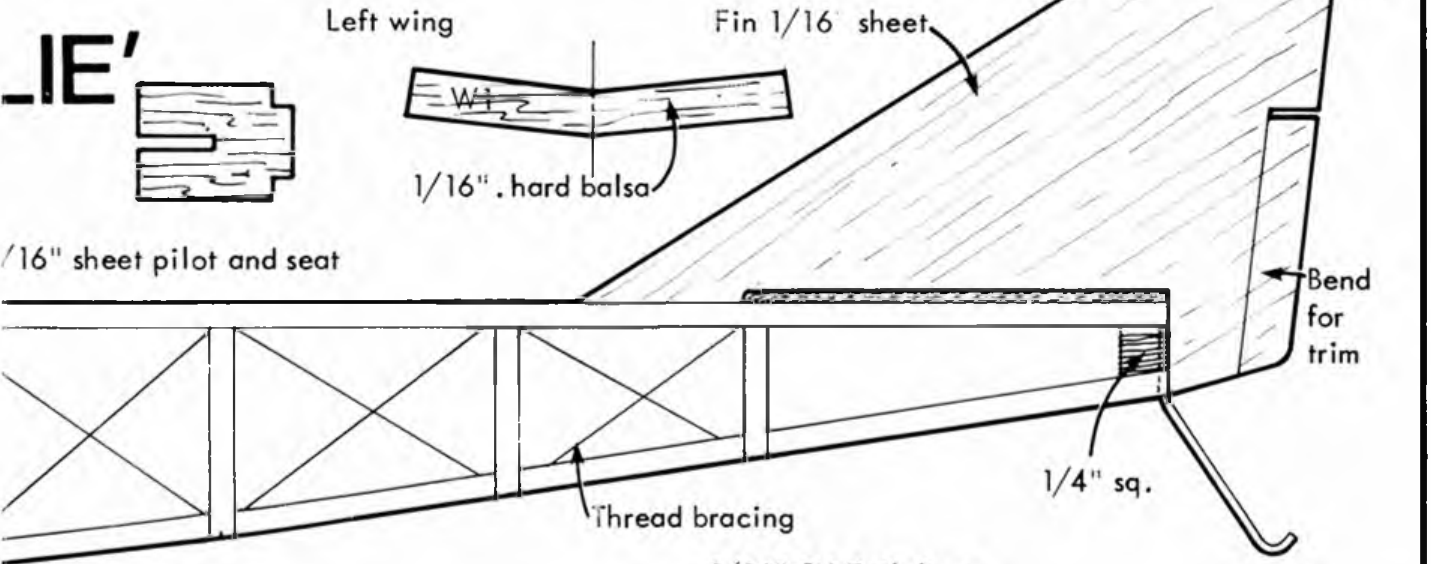
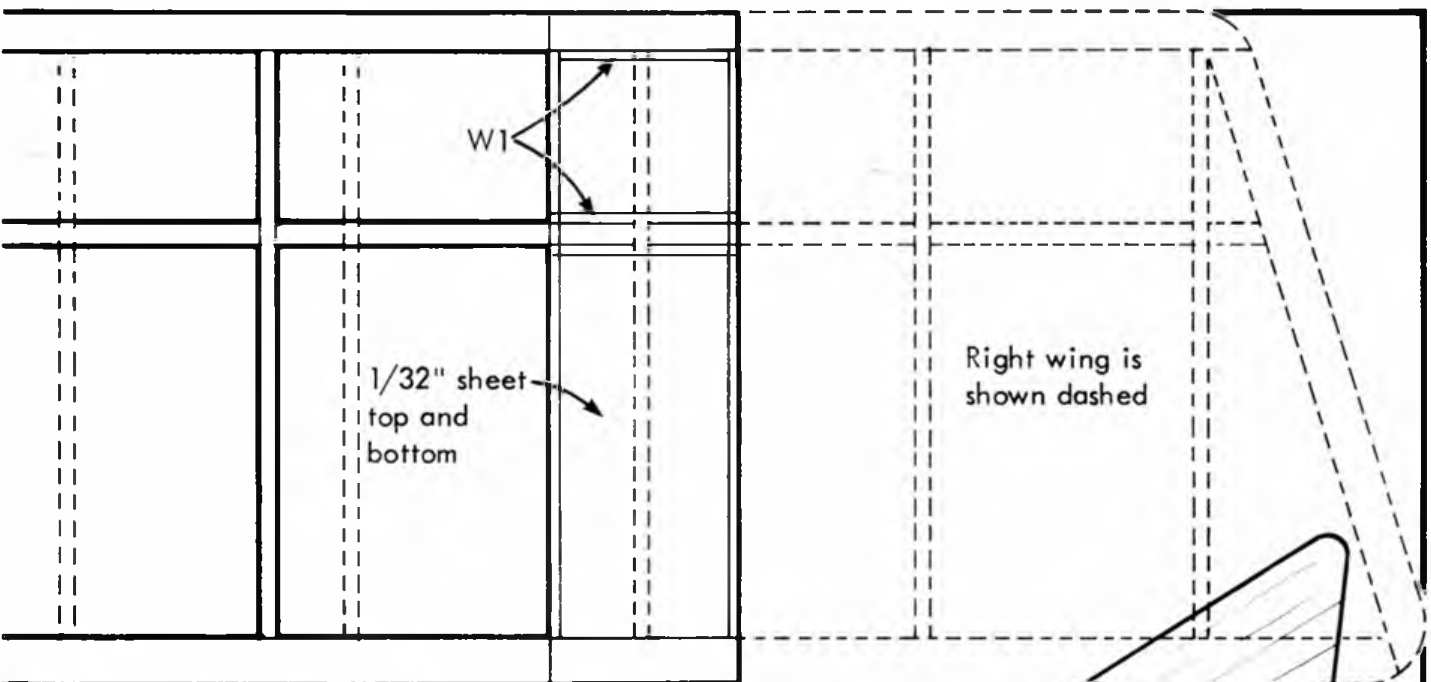
Flying

I was surprised to find that my prototype balanced OK after I first assembled it.

First flights showed the need for some trim changes, namely down and sidethrust. A strip of $\frac{1}{16}$ in. balsa behind the top left screw on the motor gave sufficient down and sidethrust, and a tweak of right rudder provided all that was necessary. This gave a climbing right power flight, with a right glide and contained the model within my rather small flying field.







by JACK HEADLEY

Engine News

by Peter Chinn



The 1981 Thunder-Tiger 15. This is a new design that differs appreciably from previous models.

One thing for which the manufacturer must be given credit is the steady improvement in production standards that has taken place since the first Thunder Tiger engine appeared seven years ago. This latest 2.5cc model is quite an attractive looking little motor and comes complete with a pressure diecast expansion chamber silencer that attaches directly to the exhaust duct with two screws.

The motor examined, complete with an appropriate glowplug (not supplied) checked out at 130 grammes (4.6oz) or 167 grammes (5.9oz) with silencer.

Turner inline twin diesel

Three years ago in these columns we published photos and a description of an alternate-firing inline twin-cylinder diesel made by M. D. Turner of Heybridge, Essex. Recently, Mr. Turner has been in touch again. He wrote:

"I have read with interest your report, in the March 1981 AERO MODELLER, on the Italian B & C 61 engine and was struck by the structural similarity to my own engine which has been developed from my TT-38 that was mentioned in the April 1978 AERO MODELLER.

Mr. Turner sent along some photos of his new engine which is broadly similar to his earlier model, in that it uses P.A.W. 19 cylinder-liner and piston assemblies on a one-piece crankcase, with rotary-valve induction between the two sealed crank chambers.

As we said in our earlier article, the tricky bit, with any inline two-stroke, centres around the bottom end, particularly the crankshaft journal and bearing between the two crank chambers. In his original engine, Mr. Turner, instead of using two crank discs, made the centre journal, with its two crankpins and rotary-valve ports, in the form of a drum, supporting it in a thin walled sintered bronze bush. The new engine, however, has a normal diameter centre journal carried in two ball bearings and to achieve this, Mr. Turner adopted a two-piece centre shaft assembly and one which the B & C 61 set-up closely resembles.

As on the B & C 61, the assembly consists of a central shaft with one integral crank-disc and crankpin, a second crankdisc that is pressed onto the other end of the central shaft, two ball-bearings and, between the bearings, the machined aluminium seal that separates the two crank chambers and contains the intake port from the carburettor.

The problem of ensuring that the two rotary-valve ports in the centre shaft were exactly 180 degrees apart and precisely aligned for the required intake timing, was overcome by making a drilling jig from a short piece of hexagonal bar through which the shaft was inserted diagonally, and located by its crankpin. Two drilling holes at 90 degrees through adjacent faces of the hexagon bar ensured that each rotary-valve

Omission — May issue

By some mischance, part of the final paragraph was omitted from the item about fuels for fixed compression diesels on page 242 of the May issue. Following the mention of weird early mixtures containing turpentine or nitrobenzene, this should have concluded with the words

"These have nothing to recommend them to the owner of a modern high-speed variable-compression model diesel but, as they have the effect of retarding, rather than advancing, the ignition timing, they may be useful for an old fixed compression engine that tends to pre-ignite when called upon to turn a big prop."

1981 Thunder Tiger 15

The first Thunder Tiger 15, like the current Flash 15 engine, also from Taiwan, was clearly a copy of the Enya 15-III. This was in 1974. The Series II and Series III versions that followed were less obviously 'Enya' externally but were basically the same inside.

The new 1981 Thunder Tiger, however, breaks completely with these earlier links. The main casting now has an integral front end and the crossflow scavenging system

uses a conventional transfer port, plus skirt ports, instead of Enya style twin internal flutes. This new model is, in fact, now more like an O.S.15 than an Enya, in general layout and it gets closer to the O.S. the deeper one delves. For example, its piston and liner are virtually identical with those of the current O.S. Max-15, right down to the cylinder o.d., the port locations and dimensions, the twin skirt transfer ports in the piston and liner, the 3.5mm o.d. tubular gudgeon pin with its brass eyelet end pads and the conrod length. The 9mm crankshaft, with its integral 4mm crankpin, apart from being less cleanly machined and ground, is also practically indistinguishable from that of the O.S.15. One change, however, is to the cylinder head which has a machined bowl-shaped combustion chamber and lacks the O.S.'s squish band.

A new crankcase with an extra large exhaust duct, thicker beam mounting lugs and what looks like a ball bearing housing (but is not) at the front end, lessens the engine's resemblance to the O.S. externally and the throttle type carburettor, despite an identical needle-valve assembly, also looks different by reason of having a black plastic body (apparently glass reinforced nylon) in place of the pressure diecast aluminium one of the O.S.



A new Thunder Tiger 15 comes complete with a silencer. A resemblance to the O.S. 15 will be noted



M. D. Turner's 6.2cc in-line twin diesel, a development of his earlier TT-38

port was correctly located at 60deg. to the shaft axis and joined up with its respective gas passage. These operations completed, the first ball bearing, the centre seal and second ball bearing were fitted. The rear crank disc was then pressed on, having been aligned using a vee block and dial test indicator. Finally, a hole was drilled down the joint and a pin pressed in to key the assembly.

As with the original TT-38, the carburetor is fitted at an angle on the side of the crankcase above the mounting lug, instead of vertically between the cylinders (as on the B & C 61), and this has the advantage of bringing the two cylinders closer together and reducing overall length. The front half of the crankshaft is supported in a single ball journal bearing supplemented by a bronze outer bush. The P.A.W. cylinder liners each have three radial exhaust ports with internal flute type transfer ports between. Nominal bore and stroke are .640 x .590 in., which gives a total swept volume of 0.3796cu. in. or 6.22cc.

COLLECTORS' CORNER

The American Gwin-Aero petrol engine illustrated here is the property of Raymond Morse of Potter Heigham, Norfolk. Ray, who has long been well-known as an airship enthusiast (his house is called 'Lakehurst') bought this engine, new,

before the war. It is 100 per cent complete, right down to its Champion 'V' $\frac{3}{8}$ in. sparking plug, cylindrical fuel tank, the original Bunch ignition coil and condenser and he still has the Austin-Craft pneumatic flight timer purchased for it at the time. The engine was run only once or twice, then put into storage.

The Gwin-Aero, marketed by the Bunch Model Airplane Company of Los Angeles, was one of the earliest 'production' model aircraft engines, the very first version having appeared in the summer of 1936. At that time, the Gwin-Aero had a bore and stroke of $1\frac{3}{16} \times 1\frac{1}{16}$ in., giving a swept volume of 0.421cu. in. or 6.90cc. The original engine used a plain unfinned cylinder head and had the exhaust at the back, above the piston-controlled intake port, the transfer passage being at the front, as on the Brown Junior. In other words, it looked more like the other Bunch engine that followed it a few months later and which was called the 'Mighty Midget'.

In 1937, both the Gwin-Aero and Mighty Midget had their cylinder bores enlarged to $\frac{7}{8}$ in., increasing their capacity to 0.489cu. in. or just over 8.0cc. The new version of the Gwin-Aero had the cylinder turned through 90 degrees, so that the transfer was on the right and the intake and exhaust on the left, the latter being provided with a neat fabricated exhaust stub pipe. It also had a finned cylinder head. At this time, the cylinder heads on both engines were detachable, held down with six screws.

In May 1938, a number of modifications were incorporated in what was announced as the new 'Model 38'. Cylinders were now made in one piece — i.e. machined from steel with integral finned cylinder-heads. As before, the intake pipe, transfer cover and (in the case of the Gwin-Aero) exhaust pipe, were brazed onto the cylinder. A new contact breaker assembly was also adopted.

The 'Model 38' Gwin-Aero, of which Ray Morse's engine is an example, remained in production unchanged until the end of 1939. As with most pre-war model engines, the emphasis was very much on low weight. The crankshaft, for example, had a journal diameter of only $\frac{5}{16}$ in. and ran in a bronze bushing in a lightweight diecast aluminium crankcase which had a screw-

in diecast backplate. The crankcase was also threaded for the screw-in cylinder. The piston was of aluminium with a domed deflector crown and was fitted with two compression rings. The piston was coupled to the crankpin with a fabricated steel connecting-rod.

The contact breaker assembly was free to move, in the usual manner, on the crankcase nose, to allow the ignition timing to be retarded for starting and advanced for full power. It had an eccentric bush for adjusting the points gap and the moving point was lifted by a cam formed on the rear of the steel prop driver. The cam was keyed to the shaft by means of a $\frac{3}{32}$ in. dia. pin inserted diagonally through the shaft. The intake pipe was of $\frac{5}{16}$ in. o.d. steel tube in which was installed a vertical spraybar needle-valve assembly, soldered directly to the brass fuel delivery pipe which, itself, was soldered into the fuel tank.

In the Thirties, when all models were free-flight and the lowest possible wing-loading was what everyone strove for, there is no doubt that low engine weight was an important selling point. The result was that advertised engine weights tended to be more than a trifle optimistic. A 'bare weight' (i.e. less coil, condenser and battery) of 6 $\frac{1}{2}$ oz was, for example, quoted for both the Brown Junior and the Gwin-Aero. Both weighed more than this. Actual checked weight of Ray Morse's Gwin-Aero, for example, is 257 grammes or 9.06oz. This includes the fuel tank, since it is soldered to the engine's needle-valve assembly, but even if one were to unsolder the tank, bare engine weight would still be over 8oz.

Incidentally, an interesting sidelight on the way in which manufacturers improvised, in the early days of model engine manufacture, is seen in the Gwin-Aero's fuel tank. Soldered up from tinplate, this is a cylinder based on a pair of end caps that have the words 'Pry Out' embossed on them. One can only ponder as to what these were originally intended for, but our guess is that they were probably manufactured as plug-in lids for the sort of small cardboard containers that were used for spices and the like. And why not? Petroleers of bygone days will tell you that the best fuel tank of all was the small oval Coleman's mustard tin!



Left: the Gwin-Aero with tank/needle-valve assembly removed. Note lack of assembly screws. All-steel cylinder had integral head and was threaded to crankcase, as was backplate.



Right: Ray Morse's completely original Gwin-Aero which he bought new 42 years ago!

SCALE MATTERS



Seen at Old Warden, this very impressive control line APS Vickers Viscount by Ron Bye shows all four Cox engines on full song. Two .15s and two .09s are used.

by
Alan
Callaghan

Peanut Scale Rules OK?

No, they do not, and if recent developments are anything to go by, it seems that at long last a new set of rules for Peanut Scale contests are to be formulated by the SMAE Scale Committee. Ever since they were first adopted as provisional scale rules in this country, these rules have been anything but a satisfactory system of marking scale models. In their initial form as used at one of the first events to be staged in the UK, they left room for a scale event to be won by a model that scored virtually nothing in the static scale section. The relevant loophole was quickly closed (after the event of course!) but ever since then many flyers have been deeply suspicious of the narrowness of the formula that has given birth to the most successful types of Peanut model. Marks have always been given until now according to a check list of many individual items, in such a way that they are discussed in a yes/no manner, i.e. does the model have the scale number of wing ribs? Do the control surfaces move? Is the engine exposed? Does it have rigging wires? And so on.

The idea is that the system could be worked quickly and easily by the 'judge' and not much judging experience was actually required. From this kind of system, and armed with a scoresheet, it has been quite possible to sit down and estimate reasonably well how many points one can hope to score in static, *before actually building the model*. The result of this is that it very much affects one's choice of prototype, in that one does not choose a subject where for example the ribs are unseen, the engine is fully cowled, wind-warping is used etc. Certain subjects will fit the given formula reasonably closely and still be a feasible subject as a very small flying scale model,

and others just simply will not. The high-wing cabin monoplane with its well-known stable flying characteristics, a visible engine, movable control surfaces, perhaps a spatted undercarriage, is almost a guaranteed bet compared to virtually any other type. Despite the various bonus points offered for such as a biplane, a low-wing design, or even a triplane, the unpredictable nature of these types in flying offers very little incentive to those who may just fancy something a little different as well as a spot of contest success. Hence the plethora of Laceys, Wittman Tailwinds, Nesmith Cougars, Piper Cubs and similar types that have dominated the Peanut contest scene since the beginning with only the very odd exception. Of course everyone is still

looking for the triplane, floatplane, canard, with twin engines and an autogyro facility that is going to scoop the bonus points jackpot. But even jokingly, want an attitude of mind to have to adopt towards a scale contest! Unlike duration events where a strict and simple formula is laid down for model configuration, and deviations are simply disqualified, the well thought out set of scale rules should be capable of embracing all types of aircraft on an almost equal footing. Check lists of individual items other than for things such as accuracy, realism, and workmanship are so much open to conjecture as to be worthless and a really thoroughly comprehensive one is quite impossible to formulate.

The present set of Peanut rules could not in any way accommodate an exact scale



This ultralight Peanut Rearwing Speedster by the author is covered in condenser paper sprayed with matt enamel in cellulose thinners. Weight is 2.5 grammes and the model requires very little rubber to do 60-second flights.

Rutan Quickie, although it has been shown to have good potential as a subject. There is no category for foam aircraft, let alone tandem wing layouts. The system of marking the covering materials and finishes gives no credit whatsoever to the modeller who can make his aircraft look very realistic irrespective of the medium used — if it's tissue it scores 'X' marks, if it's condenser paper it's 'Y', and so on. The beautifully-built all paper aircraft (it can be done) is another exception. One fundamental point has always been overlooked. In flying, Peanut models are almost invariably handlaunched (though occasionally a ten-second bonus is added for a take-off), yet a WWII subject built with the wheels retracted not only because it looks better in the air, but also because it saves much weight on such small critically-loaded models, loses marks for having no undercarriage and is at the same time harder to fly. Its aptness is its downfall!

The checklist system can encourage total inflexibility in marking, too. Several years ago a model of my own, a Bucker Jungmeister was given no marks at all for engine detail despite having the front half of the engine visible, a collector ring and exhaust system, and a moulded cowling system that required more work than all the flying surfaces put together. As the motor was not fully exposed, it did not rate a score

... If you care to look up the Scale column in the May 1981 issue, you will see featured two models in particular, a Stampe SV4B biplane and a Davis DA-2 low-wing monoplane. The Stampe is a highly-detailed piece of work in every respect, structure, colour scheme, and is very accurate. The Davis does not pretend to be anything other than a simple model, neatly built, and finished in coloured tissues, yet it scored only .5 of a point less than the biplane — presumably because of the low-wing configuration, tricycle undercarriage and unusual tailplane and the bonus factors



John O'Donnell launches his Peanut Fike Model E at Spennymoor, closely watched by the judges. The starboard fuselage side shows signs of damage — a re-visit of using ultralight building methods on scale models but excellent flight qualities are a compensation.

that these features entail. The Stampe was also out-pointed to the tune of twenty-odd points by more than one square-box fuselaged monoplane, in a way that simply could not occur with any other scale marking system regardless of the scores given for quality of workmanship. These are only a few examples of odd results that have been seen over the years, and assuming that all judges are OK (now there's a thought!) then the faults can only lie within the marking system.

The checklist system was supposedly intended to be foolproof, and the scoring method laid out in such a way that anyone could use it. Clearly it has shown itself not to be foolproof, and it is certainly open to doubt as to whether entrants really wish to have their efforts judged by just 'anyone'.

The preceding is written mostly from the point of view of the scale builder who probably has as much of a strong interest in fullsize aircraft as in models but criticism of the Peanut system has also recently come from the opposite stance — that of the duration flyer. Following the Derby meeting, John O'Donnell has written to voice the opinion that the very best flying models in Peanut scale, i.e. those employing ultralight construction at the expense of scale detailing such as his own Fike E, are also at a disadvantage because full credit is never given for these models' very good flying qualities. As long as flights are judged simply by the stopwatch, this will always be the case, despite such models being virtually guaranteed top flight scores. John emphasises that these are contests for flying scale models and he has a valid point. Having myself flown several ultralight models in recent years I would agree that they really are the superior flyers but there is no doubt that due to the limitations of size, the more uncompromisingly one aims at flying performance the further one is forced away from the accurate and well-detailed scale model, but as the example of the Stampe shows, there can be as little hope at present for the super-detailed model as there is for the simple ultralight to achieve overall contest success. Whilst not

to underestimate the need for an accurate and detailed subject, a very reasonable bias towards the flying side can be arranged if points are divided equally between Static, Flight Duration, and Flight Realism. Having first encountered this system in use at a North Eastern Area indoor meeting some years ago, I use it as a basis for the Outdoor Rubber Scale contest held at Old Warden in July each year and it works very well. Each section is allotted 50 points, Static and Flight Realism are subdivided into smaller sections, and a 50-second maximum enforced on Flight Duration. Using this arrangement, the bias is clearly towards the flying side but not to the advantage of ultimate duration. Winding up a rubber model for the latter is very different from winding up to achieve realism in flight, and as 50 seconds is not really so hard to achieve with a good model, the challenge is to get it looking realistic in the air and not like an ultralight model.

For Static marking the models are mainly 'eyeballed' from a distance as in Class II or Stand-Off Scale in R/C and Control Line, but a close inspection is also made simply to establish the quality of construction and finish. Although the overall total of 150 points may seem low, it should be emphasised that every single point and half-point is worth having, and ties rarely occur but should they do so, a second round of flying is easily arranged.

In thrashing out rules for an apparently simple little contest, one may ask is there a need to take it all so seriously? Well, contest records of entries over the last five or six years show that more people have taken up the challenge of flying Peanuts than nearly all other forms of free flight scale modelling combined, and such interest really does deserve to have a thoroughly adequate set of contest rules at its disposal that will more easily accommodate a far wider range of suitable subjects, with a good chance of success than the existing rules have bred up to the present. If you fly Peanut and have ideas on the subject of rules, why not pass them on to the Scale Committee through Harry Hotham.



Jack Jansen shows the attraction of F/F Scale on a quiet afternoon at Epsom Downs with his Blackburn Monoplane. In the background Paul Leith reads his DH60 Moth 'Jason'.

R/C Sport Flyer

by
Chris Pinchbeck

AS REPORTED last month the *Keil Kraft SE5A* had reached the stage where the framework was covered and the next step is to prepare the heavyweight tissue for painting

Since the covering was put on damp there is obviously no need to water shrink it; however, if you use a 'dry' technique the next job is to spray lightly with water overall and carefully pin down on scraps of balsa to let the part dry overnight. One of the hand operated spray guns used for spraying insecticides or house plants is ideal for this. When dry, give a coat of clear dope thinned 50/50 with thinners. Wait until it is touch dry, then pin it down to your building board in the same way as

stresses are equalised. With sheeted areas I believe that an initial coat of thinned dope is beneficial to guarantee a good bond between covering and sheet but thereafter I use sanding sealer. Some would use sealer for the first coat as well; it is really a matter of preference. However, a word of warning.

inference is that in the second case extra coats of dope will of course add weight.

Having pinned your parts to the board for drying, unless you are particularly clever, there will be pin holes around the perimeter. These can be filled with a Polyfilla or a similar fine grained but soft

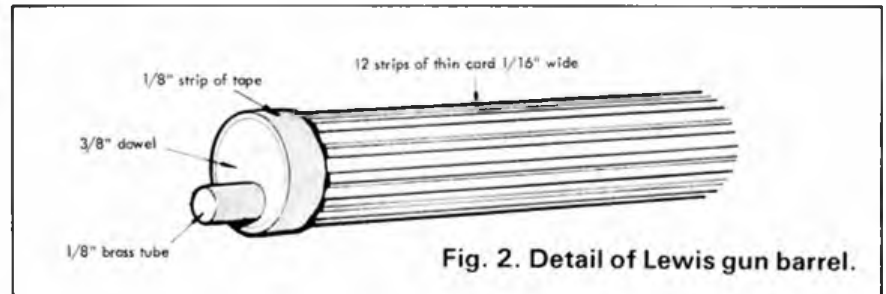


Fig. 2. Detail of Lewis gun barrel.

Do not use sanding sealer on open structures where the covering is likely to flex eg. wings, since it is not flexible like dope and will crack with time and use, leaving a crazed surface finish. In extreme cases this can quite easily crack the paint finish as well.

Once the first coat is fully dry, the model must be sanded overall with either 'flour paper' or 600 grade 'wet and dry' used dry. Only use very light strokes on the open areas or you will be through the covering!

stopping compound. Rub back until only the stopped pin hole is left. Then a tiny dab of dope and the hole should be sealed.

A final check for imperfections, then a wipe over with the tack cloth and all is ready for painting. I normally use Humbrol enamels and in the past brushed these on. The secret is to thin the paint; ordinary white spirit is satisfactory, aim for a consistency of milk. Only a little thinner is necessary with matt enamels, rather more with gloss colours. Use a very soft wide

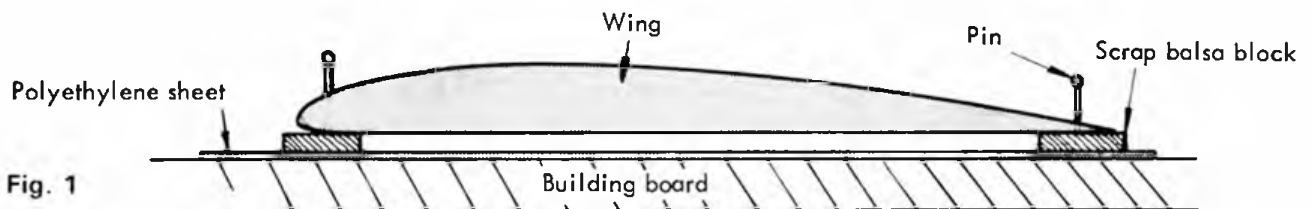


Fig. 1

described above (see Fig. 1) Wings should be doped one panel at a time so that they can be pinned down and left overnight until the dope has fully dried out and taughtened the tissue. If an open structure is not pinned down, then it is certain that warps will develop. Prevention is better than trying to cure the fault after it has happened. Wings with a single main spar on the lower surface will almost always take an upwards curve from root to tip no matter how careful you are. Provided this is not too dramatic then the flying performance will not be adversely affected. It is almost like built-in dihedral. Obviously a fuselage cannot be pinned down so ensure that an even coat is brushed on overall so that the shrinking

Then wipe the areas with a tack cloth to pick up any dust and apply a second thinned coat of dope or sanding sealer, observing the same precaution of pinning down and leaving overnight to dry. Once this coat has dried, a final light sanding should give you a base upon which to paint.

Finishing

The secrets of a good finish are basically three-fold. Firstly a well prepared smooth, gap and ridge-free structure, secondly a taut wrinkle-free covering, and finally a smooth, thin base sealing coat rubbed down between applications. It has been said that a good finish is 'rubbed down to' rather than 'built up to', the additional

brush and light, long strokes, 'laying off' in the opposite direction — eg. apply paint to the wing along its length, then very light brush strokes just touching the surface in a chordwise direction. Do not try to cover too large an area at one time before 'laying off' or the paint will start to dry and you may lose the wet edge. Incidentally, if the paint has streaks when you apply it, then this means that the pigment is starting to separate out and you have thinned it too much. The other point to remember is that thinned paint will usually darken with storage.

The SE5A has been spray coated this time using a Badger 200Ex airbrush driven from a small compressor. Spray painting or airbrushing is a subject on its own and has

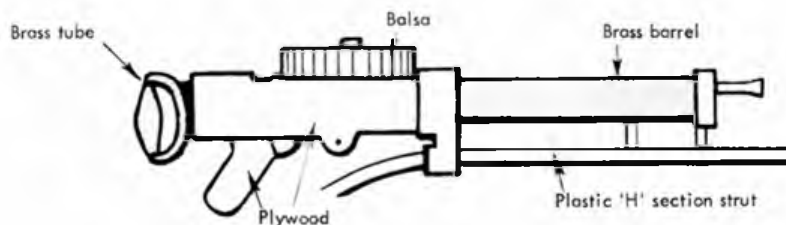
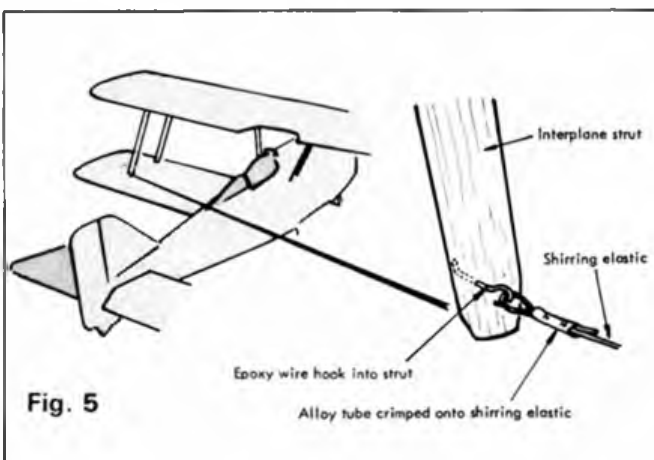
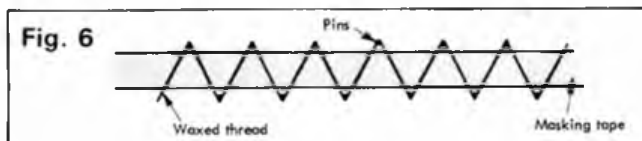
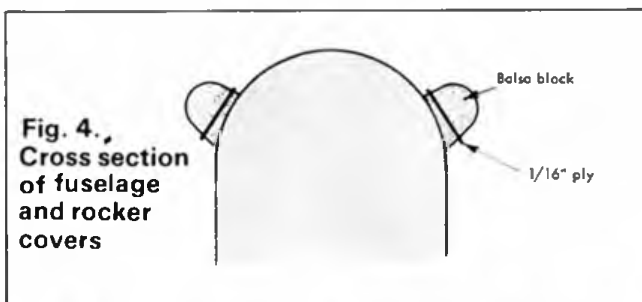


Fig. 3. Simplified Vickers machine gun



been fully described in a series of articles by Ian Peacock, starting in the February issue of *Aeromodeller*. Colour finishing is easier and better after some time has been spent practising the art. I would recommend that if you are contemplating the purchase of an airbrush, then you wait until you can afford one of those where the paint/air is mixed in the head of the gun and not outside in front of the air nozzle. This latter type is cheaper but it is rather more difficult to obtain 'expert' finishes. In other words, you get what you pay for — as ever!

To return to the subject, Humbrol authentic colours were used for the model. RFC green for the upper surfaces and Doped Fabric for the undersides. The waterslide transfers supplied were cut out around the perimeter of each item so that the backing did not spoil the overall appearance and a final coat of matt polyurethane sprayed overall to provide the final fuel proofing.

Modifications

I have already mentioned some modifications made to the basic structure during building to improve the scale appearance. Now for the additions. The first of these was a Lewis machine gun to mount on top of the fuselage in the gun channel. This was made from $\frac{3}{8}$ in. balsa dowel with thin strips of card glued on, a strip of PVC insulating tape wound around the front of the barrel, and a piece of brass tube as a nozzle (Fig. 2). The whole gun barrel was doped twice, rubbed down, and painted matt black. The next piece of armament is a Vickers machine gun on a Fowler mount over the top wing. As can be seen from Fig. 3 this was made from pieces of ply wood, balsa and brass tube. The magazine case was from $\frac{1}{4}$ in. balsa wood with saw cuts around the perimeter, and the handle made from $\frac{1}{8}$ in. brass tube flattened at each end. The Fowler mount was made from plastic H section, as sold by some shops for model engineering; this was heated until pliable then bent to give the final curve and drilled as shown. Once again an overall coat of dope, then sanding sealer before rubbing

down to receive the final coat of matt black mixed with a little silver. The engine rocker box top was made from the balsa block supplied but after shaping, it was cut and a piece of oversized $\frac{1}{16}$ in. ply inserted to represent the typical flange of the real item (Fig. 4). Radiator louvres are injection moulded and supplied with the kit. Hooks for attaching the various rigging wires were bent up from soft florist's wire and fitted with a dab of epoxy and the rigging wires themselves were cut from lengths of thin black shirring elastic (Fig. 5). The loops were held by short lengths of aluminium tube painted black which are crimped into position, the tail rigging wires pass through holes drilled in blocks previously fitted in the tailplane and fin assemblies and are tied off at the tail skid.

One of the features of this era of aircraft was the lacing along the fuselage sides holding the top covering down. This was simulated by stretching a piece of masking tape along the line of the lacing, then weaving waxed thread (as used by shoe repairers) between pins at $\frac{1}{2}$ in. centres (Fig. 6). The lower side panel under the cylinders on the SE5A is hinged and these hinges were reproduced by using $\frac{1}{2}$ in. lengths of $\frac{1}{8}$ in. aluminium tubing with two saw cuts part the way through. The radiator clips at the side of the radiator louvres were simply made up from short lengths of $\frac{1}{16}$ in. \times $\frac{1}{16}$ in. hardwood strip.

Finally, various aileron and hatch lines were drawn on using a fine black fibre-tip pen and flexible straight edge; this was completed before the fuel resistant coat mentioned above was sprayed on.

The next job was to finally install the radio gear. The Futaba FD30M servos were mounted with wood screws into hardwood bearers which in turn were held to the fuselage sides by balsa blocks. The elevator and engine throttle controls are rod in tube snakes, and the rudder by a closed loop system. This latter system used lightweight laystrate wire and this passed through a short length of plastic tube at the fuselage exit points. The system is adjustable at the servo end by proprietary threaded brass ends and a clevis. At the rudder horn end,

the laystrate is passed through a tube to form a loop; this is then crimped and secured with a dab of epoxy. The receiver was put into a small polyethylene bag and secured with foam packing under the fuel tank, and the aerial led outside and along the bottom of the fuselage with tension provided by a small rubber band. The switch is mounted inside the fuselage and remotely controlled by a short length of wire. Positioning of the battery is controlled by the need to achieve the correct centre of gravity location.

An Irvine .20 engine was used as the power plant turning a 10 \times 4 wooden propeller and fed through a filter from a 4oz. clunk tank. Battery connections to the glowplug were permanently fitted via a sub-miniature jack plug. One wire to the engine mounting lugs and the other to a press stud (as used in dressmaking) which was clipped to the glowplug post.

Flying

A still evening in May was the chosen time. The engine started with no difficulty, all controls were checked and the model released for its take-off run. Fortunately my club has the use of a tarmac runway so that an R.O.G. with a small model is quite possible. A touch of rudder to maintain the heading followed by a slight easing of the elevator and she lifted off. Some left trim was needed to maintain a straight heading but apart from this, she flew beautifully on about threequarters throttle. After a couple of passes the model was landed and the rudder adjusted to bring the trim lever back to neutral. Subsequent flights have proved the model docile to handle and a joy to see in the air. Not for absolute beginners, but certainly a first after the initial trainer.

Postscript

Pressure at work means that unfortunately I am no longer able to write the Sports Flyer column each month. However I am assured by Colin Rattray that the articles will continue. I would like to take this opportunity of thanking all those who have helped me over the past two years, and especially the manufacturers and agents who have supported the series. In the meantime, happy landings to all.

FROM THE HANDLE

FAI INTERNATIONAL THREE SISTERS C/L SITE 23/24 MAY, 1981

Reported by Albert Atherton and Jim Woodside.

LOOKING OUT over the fenced tarmac rings where some familiar Continental aces were racing or performing the aerobatics schedule, one might have thought this is Genk, Pecs, or some other glamorous venue for the movable feast of international competition. But no — this is England, the heavy showers of rain confirm the venue!

The new flying site at Three Sisters Recreational Centre for Noisy Sports is the first purpose-built flying site in the U.K., where a full International Control Line Meeting can be held. Permanent circles are established for aerobatics, speed and teamrace and there's an adequate grassed area for combat. With its permanent metal safety cage the teamrace circle is large enough to take open speed while the actual speed circle has a temporary nylon cage and is, because of its size, to be used for FAI speed and teamrace during SMAE Centralised Meetings.

Supporting amenities include a small club house with bar, flush toilets and a refreshment stand near to the circles. Ample parking facilities add to the attractions of this first fully operational control-line flying site in the U.K., and for which the North Area must be commended.

For this first contest, entries came from France, Holland and Spain. We hope that they take home with them good reports which will attract many more visitors next year.

As with all competitions, success depends upon the competitors — this meeting being no exception. They flew with promptness and strict adherence to the rules, which certainly made life easier for the contest directors and the FAI jury — Tony Arts of Holland and Malcolm Ross of the U.K.

Local councillor Wilf Brogan opened the competition on Saturday morning and kindly returned on Sunday to present the prizes. The NW Area are indebted to Gordon Isles for designing the set of medals and to Irvine Engines for their generosity in providing magnificent goblets, tankards and glassware. While we are handing out the bouquets, let us not forget Derek Leigh whose dedication led to the building of the Three Sisters Contest Site.

SPEED

THE INTERNATIONAL was due to begin at 1.00 p.m. on Saturday, 23rd but the weather pattern took over with torrential rain interspersed by bright periods of sunshine, and hail storms which included thunder and lightning on the Sunday.

Nine entries in speed included Carlos Olive from Spain, who flew in both speed and teamrace to add a Continental atmosphere. Gordon Isles opened the first round but did not go into the pylon as the run was far too rich. In the later reflight the venerable Rossi (British record holder since '77) was on song at 155.24 mph. Flying in his first FAI meeting Ken Morrissey suffered the misfortunes of not recording a time, and then in practice at the end of the day he hooked his wrist strap on the pylon to write off the model. Brian Jackson, Dick McGladdery, Jo Halman and Paul Eisner all followed without flights. It was left to Peter Halman and Carlos Olive to fly successfully at first attempt. Peter with 143.13 mph and Carlos 136.74 mph. At the end of the day all the fliers with the exception of Gordon were out practising. Jo Halman was unhappy about her future as a speed flier as it looked as if she simply was not able to fly. So husband Peter, made a decisive test flight. Was it Jo, or the model? Peter could only keep the model in the air for three laps! He pronounced "this model is unflyable"! Jo was over the moon — it was not her fault and her speed flying prospects were still viable. Meanwhile, Peter was not at all happy with the way his engines were behaving. Other fliers had glum faces too.

Round two on the Sunday was delayed because of torrential rain, but after a slow start Dave Smith recorded 144.51 mph which was to be his best flight giving him third place. Dick McGladdery returned 135.99 at his second attempt. Brian Jackson again flopped with two no-flights while Peter Halman, at his second attempt made 140.87 mph. Carlos Olive was relatively slow with a flight of 131.51 mph, then Paul Eisner 142.31 mph. With her second model, Jo Halman used her two attempts to prove (to herself) she could still fly. Alas the engine runs were not worthy of attempting to enter the pylon.

Round three was flown through rain, storms and sunshine. Paul Eisner flew first, reeling off the 148.15 mph which had been his practice speed, to gain second place. Jo Halman committed the tactical error of going in the pylon for a last ditch effort at recording a speed on her first attempt then Dick McGladdery recorded 127.83 mph. Dave Smith was slightly slower than in his second round, with 143.59 but Gordon Isles was on form with 156.33 mph — the fastest FAI speed ever recorded in the U.K. for a well deserved first place.

In the aftermath both Brian Jackson and Carlos returned no flights and Peter Halman left the circuit disgusted with 135.91 mph.

TECHNICALITIES

ALL THE MODELS were asymmetric, with aluminum wings, either hollow or skinned over balsa except Dick McGladdery's which had a wooden wing. Gordon Isles, Brian Jackson and Dick McGladdery use upright Rossis and all the

rest were side-mounted with Ken Morrissey's different from usual in that he had followed Schuette and mounted his engine headed inboard. Isles alone used a two blade carbon fibre prop while Eisner, Olive and the Halmans chose single blade carbon fibre props. Jackson, Morrissey and Smith used glass two bladers. Most of the tuned pipes were Rossis with Isles using the extended Rumpel system. There were three kinds of fuel systems: Isles, Jackson, and the Halmans used the Centifugal Fuel Switch while Smith and Olive used suction. Eisner had a timed crankcase pressure system and Dick used his own 'McGladdery Flap' form of choke on the only rear induction Rossi. All the others were front induction Rossis.

F2C — TEAMRACE

FIFTEEN TEAMS entered and it was pleasing to welcome three teams from Spain as well as Bert Meikemeijer and Enrico Flores from Holland. Now that the FAI Sporting Code will allow Italian born Enrico to fly for Holland, he and Bert will fly as a team and Rob Meikemeijer will concentrate on the production of F.M.V. motors.

The first round of heats got under way very promptly at 2 pm on Saturday. Most of the semi finalists established their claim in this round as the weather was warmer and drier than the following morning. Smith/Brown put in the only sub 3:40 time in the 3rd heat while Langworth/Broadhead scored a 3:43 in the same heat. In heat 2 an incredibly under-compressed sounding AAC FMV recorded 3:41. This distinctive sound is caused mostly by the design which has the cooling fins machined direct onto the liner in the style of a Cox engine.

In Round 2 on Sunday morning, held in cool showery conditions, Gardiner Wilson, Rudd King and Archer Sladdin moved into the top nine, with 4:14.3 being the semi cut-off time.

The semis brought Meikemeijer Flores and Smith Brown together in both rounds. Close racing ensued with one heat memorable for having both models passing and re-passing with no one model having a clear advantage. Langworth/Broadhead recorded a 3:47 in their second semi using their distinctive model which features built-up wings. This system does seem to offer advantages in accuracy of construction and rigidity. Hopefully Berni will pen an article on his construction techniques later in the year.

While Practising for the final, Meikemeijer Flores experienced difficulty in obtaining a satisfactory 34 lap setting. They then settled for a technique not seen for some years — full hole for 29 laps.

In the final, the FMV had a speed advantage and took Smith/Brown twice in the first tank. However, disaster struck at the second pit stop (60 laps) Bert lost orientation and landed the model past Enrico. Disaster struck in a cross-wind restart the model ran in leading to disqualification!

Steve Smith and Collin Brown were able to take full advantage of reduced traffic to come home first in a new U.K. record final time.

Thanks to all the overseas competitors who came, especially those from Majorca. Patron-



Left: Ken Morrissey, who in practice hooked his wrist strap on the pylon, causing him to write-off his model.



Right: Langworth/Broadhead with their model which has built-up wings. They recorded 3:47 in their second semi-final.

d'Equipe, Ian McIntosh, tells me the Christmas weather over there is excellent. They have a circle, now what a good idea for a January holiday!

F2B AEROBATICS

THIS AEROBATIC event at the new site attracted only ten competitors. Three came from France, and the other seven from the U.K. Thus aerobatics were neither 'International' nor even truly representative and the blame for this situation rests with the pre-contest ministrations of the organiser. In view of the low entry, each pilot was permitted four flights, the highest two scores to count. Due to the adverse weather conditions these were completed late on the Sunday, delaying the prize giving — to the stage where it only just happened before the team arrived to dismantle the marquee!

The flying circle at 3 Sisters is well laid out, but has rather a high crown at its centre which affected the pilot's attitude to his model. Two thirds of the perimeter are enclosed by a high spectator (there weren't many) banking, and to assist pilot/model orientation an artificial horizon of Glow Tape was provided.

In general the flying was of a high standard, with Bill Draper and Marc Lavallette fighting for first place, the result being decided on Sunday in the Frenchman's favour when all fliers recorded the highest scores.

There were only two new models on view, Roger Quilters 'Spacehoundish' with red paint job and Pete Arkley's 'Olympus' influenced twin fin, both comparatively unflown before this event, and one mustn't forget Arthur Tipper who has had a complete change, now flying a pair of Wellingtons!

Both Vivienne Charles and Bill Draper had a couple of 'shocking' flights, due to a highly charged large black cloud which caused sparks to jump from hand to body, affecting both pilots and models. Bill is now working on a rubber handle!

The spirit which prevailed was typified when, after Pete Arkley removed part of his outboard wing on an inverted landing, organiser Arthur Eves looked at it, drew up a chair, some Hot Stuff, tape and with a lot of expertise effected an excellent repair before Pete's next flight.

Barry Robinson only has himself to blame for his unusually low position, because the Three Sisters South Wind decided to put his North Wind through its paces, giving Barry a few hair raising moments.

In 3rd place, Gilbert Beringer flew the model he used at last year's Nats, its aerobatic capacity is only matched by Gilbert's aerobatic prowess during the 'squares' (he'll do himself an injury one of these days).

It looks as if, at long last, that we can establish a worthy competition in the U.K. and we must thank those continental competitors who came. If we disregard for the moment the natural reluctance of fliers to pay out hard earned money to attend an unknown competition (not for long we hope) it is obvious that the FAI calendar is badly arranged. Contests which are attractive are often crowded together in a short time span. Potential competitors are having to choose between going to A or to B. If the contests in Western Europe are more evenly spaced, the chances are they would attract a better entry. Home based fliers should not feel that these meetings are only for the 'expert'. In reality, internationals are a great learning experience and a tonic for enthusiasm. If you hesitated this year — don't in 1982.

The British control line team for 1981. Left-right: Bill Draper (second), Barry Robinson (first) and Pete Tindal (third).



Peter Arkley displays his handsome Olympus ST46 powered model. Weight 4lbs built from drawings published in 'Claptrap.'



Gilbert Beringer placed third flying the same model he used in last year's Nationals.

REPORT ON TEAM TRIALS FOR CONTROL LINE AEROBATICS

Bill Draper

THE TRIALS were held to select the British Team for the European Championships which will be held at Genk in Belgium on July 7th — 11th 1981. The trials were originally to have been held at Elliott's sport field in October 1980, but were postponed to the Three Sisters site on the 26th of April.

Ten competitors were invited to attend the Three Sisters venue, but only 6 competitors were present, and although some competitors put in test flights, the trials were postponed due to high winds. The re-run was held at North Weald on 10th May between those competitors who had attended the first attempt.

The weather was calm but with periods of rain during the morning. Three rounds were flown and rain affected all competitors during the first round. Conditions improved for everyone for the second and third rounds. The damp atmosphere was affecting several motors causing a rich run for Arthur Tipper in his opening flight, with consequential lack of power from the Merco 49. First round leader was Bill Draper flying his Enya 40 powered Superhawk, with Pete Tindal's merco 61 semi scale model in second place, and Neville Dickinson third with his OS 40FSR 62oz model. Barry Robinson followed with a Merco 49 powered Northwind and Ron Ertherton in fifth place using an ST46.

Second round saw a change in leadership when Barry Robinson put in a smooth flight for the highest of the day, and Arthur Tipper achieved a higher score with a better setting on his motor.

The third round made no change in the final order although Pete Tindal took second place in the round.

The final team, based upon the sum of their best two round scores, are Barry Robinson, Bill Draper and Pete Tindal. The Judges were — Gordon Bryant, Mick Harvey and Reg Lowe.

Final Results	Round 1	Round 2	Round 3
1. B. P. Robinson	2736	2894	2872
2. C. W. Draper	2877	2871	2824
3. P. Tindal	2826	2778	2858
4. N. Dickinson	2801	2760	2798
5. A. Tipper	2395	2641	2678
6. R. Ertherton	2575	2562	2601

FAI INTERNATIONAL STUNT RESULTS

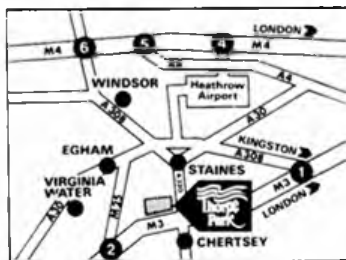
Competitor	Round 1	Round 2	Round 3	Round 4	Total	Position
M. Lavallette	2559	2640	2854	2922	6776	1
C. W. Draper	2488	2753	2746	2845	5598	2
G. Beringer	2358	2583	2686	2790	5476	3
B. Robinson	2539	2504	2674	2751	4	4
N. Dickinson	2189	2560	2644	2658	5302	5
R. Quilter	2214	2422	2546	2441	4987	6
A. Tipper	1802	2490	2487	2296	4977	7
A. Eves	1393	2127	2309	2292	4601	8
P. Arkley	—	—	2116	2162	4278	9
V. Charles	—	1030	1637	—	2667	10

LEISURE SPORT AIR DISPLAY AT THEIR HOME BASE



SATURDAY AUGUST 22nd
SATURDAY SEPTEMBER 26th

- FLYING WORLD WAR 1 AIRCRAFT
- GROUND STRAFFING COMPETITION
- EUROPE'S ONLY SEAPLANE SHOW
- SUPERMARINE SS AND SCHNEIDER TROPHY EXHIBIT



Adults £1.80. Children 90p
and O.A.P.'s £1.30.

Thorpe Park is complete family entertainment with Amusements, Historical Exhibits, Model World, Boats, World War 1 Airfield, and much, much more!

Open daily 10.00 a.m. - 6.00 p.m.
till September 30th.

Thorpe Park, Staines Lane,
Chertsey, Surrey.
Tel: Chertsey 62633.

For all those
Fine cutting jobs



SWANN-MORTON
C10 CRAFT BLADES

OBTAINABLE FROM MOST GRAPHIC ART SUPPLY STORES

AUTHENTIC SCALE

MACCHI M33 R C 39" W S	£2.75
CUSTISS JN4 JENNY R C 52" W S	£2.75
HANDLEY PAGE HEYFORD F F 37 3/4" W/S	£2.15
FAIREY SEAFOX F F 34" W S	£1.95
AVRO ANSON F F 36" W S	£1.95
DE HAVILLAND TIGER MOTH F F 24" W S	£1.35
CURTISS RC32 C L 27" W S	£2.25
HAWKER TYPHOON C L 28" W S	£1.25
FAIREY ALBACORE Rubber Power 43" W S	£2.15
HANDLEY PAGE HAMPDEN Rubber Power 27" W S	£1.35
"PEANUTS" BRISTOL BEAUFIGHTER 13" W S	76p
FAIREY FANTOME 12" W S	75p
PRAGA "AIR BABY" 13" W S	65p

For a full list of plans send an S.A.E.

When sending for plans, U.K. clients please add 25p P&P Overseas clients please include full postage (average plan weighs 150g) Cash with order.

AUTHENTIC SCALE

238 KINGS DRIVE, EASTBOURNE BN21 2XE, E. SUSSEX

THE ORIGINAL BINOMAG

Especially designed magnifier for assembly workers, inspectors, and hobbyists.

Comfortably supported on an adjustable elastic headband, the Binomag gives 2x magnification with excellent depth of focus over a wide field of view.



- Suitable for spectacle wearers
- Flip up lens frame when inspection not required
- Reduces eye strain for fine detail work
- Manufactured with top quality Ophthalmic lenses in the UK
- Replaceable headband
- Leaves both hands free

Price: £17.76 includes Post, Packing and VAT, cheque or postal order payable to Keeler Optical Products Ltd.

Allow 28 days for delivery



Keeler Optical Products Ltd Industrial Marketing Division
Clewer Hill Road Windsor Berks SL4 4AA Tel: 0735 57177

Modellers Market

THE SHOP FOR COLLECTORS OF VINTAGE ENGINES

DIE CAST TOYS AND TRAINS

243 Cheam Common Road, Worcester Park, Surrey.

Tel: 01-330 2964

★ **NOW OPEN** ★

The best selection of vintage engines for sale anywhere!

We buy and sell pre- and post-war Dinky's, Matchbox, Brooklyn, Rio, Conrad and the Dutch EFSI die-cast. Great value for younger collectors.

We stock Flair, Pilot and Jack Stafford R/C kits, and Billings boats. (Good selection of s/hand boats for callers), and Tri-Steam engine kits.

For vintage engine collectors, we sell exact repro tanks for Mills, ED, Amco and Albion diesels. Prices from £1.15 to £2.25.

Ring for details of our 'old engine', rebore service.

Open 6 days a week - Thursday 7.30 p.m.

NEW SAITO 45 four-stroke in stock. SUPERB 1/4" NGK Spark Plugs £2.40 each.

MODELLING MILESTONES

an exciting SPECIAL OFFER from M.A.P.

P.O. Box 35, Bridge Street,
Hemel Hempstead, Herts. HP1 1EE

How many of these exciting 'Specials' from M.A.P. did you miss? If the answer is some or all of them, you'll be relieved to hear that they are still available... individually — and some at a **SPECIAL OFFER PRICE** (all 4 of those marked * for just £3.00 plus £1.10 postage — that's a saving of nearly £2.00!) But hurry while stocks of these indispensable modelling aids last!

RADIO CONTROL SCALE AIRCRAFT: A mouth-watering collection of information on the design, building, and flying of scale models of all types from vintage to ducted fan — PLUS full-size 1/10th scale SE5 plan! Price £1.00 plus 25p postage.

* **MODEL BOATS R/C SPECIAL:** The perfect introduction to R/C on the water, electronic speed controllers, installation and maintenance, power and yacht, Nicad know-how, PLUS full-size plans for a 30in. Pilot boat! Price £1.00 plus 25p postage (or as part of Special Offer).

MODEL CARS (SPRING and SUMMER 81 issues): Everything the R/C track and off-road racer needs to know. Price 90p each plus 25p postage each

* **MODEL PLANES REVIEW 1980:** International coverage of designs, techniques and trends in scale, rubber duration, R/C and control-line with 18 MINI PLANS for outstanding models! Price £1.00 plus 25p postage (or as part of Special Offer).

* **FAMOUS SPACESHIPS OF FACT AND FANTASY: A SCALE MODELS 'Special'** which shows how to model 11 exciting spacecraft using commercial kits: Star Trek's "Enterprise", NASA Shuttle, Vader's TIE Fighter — they're all there and many more! Price £1.50 plus 25p postage (or as part of Offer).

* **MILITARY MODELLING 1981 MANUAL:** A fabulous collection of specially commissioned practical features on scratchbuilding, uniforms, painting, AFVs, wargames, conversions and scale plans. Price £1.50 plus 25p postage (or as part of Special Offer).



Yes, I missed some 'Specials' from M.A.P. Please send the following
 copies) RADIO CONTROL SCALE AIRCRAFT £1.00
 copies) MODEL BOATS R/C SPECIAL * £1.00
 copies) MODEL CARS — SPRING 1981 90p
 copies) MODEL CARS — SUMMER 1981 90p
 copies) MODEL PLANES REVIEW * £1.00
 copies) FAMOUS SPACESHIPS * £1.50
 copies) MILITARY MODELLING MANUAL 1981 * £1.50
 SPECIAL OFFER pack(s) of the 4 titles marked * £3.00

NAME

ADDRESS

Complete, cut out and send with remittance (DON'T FORGET TO ADD THE POSTAGE) to
 Sales Dept. M.A.P. Ltd., P.O. Box 35, BRIDGE ST., HEMEL HEMPSTEAD, HERTS, HP1 1EE

DIESEL and GLOPLUG AERO ENGINES



G-Mark 5	£87.00
DC Sabre	£10.28
Hummingbird	£8.92
Mills 1.3	£10.88
Irvine 20 R/C	£30.60
Mills 75	£9.53
Fox 15	£12.69
P.A.W. 1.49 DS	£10.53
P.A.W. 19 DS	£12.53
P.A.W. 2.49	£11.53
HB 61 R/C P.D.P.	£67.40
HGK 15 R/C	£22.60
Fox 25 R/C	£20.42
Fox 36 8B	£21.46
A/Webra 61F R/C	£76.16

Many more Aero and Marine. New Zealand orders welcome. Send P.O. for lists. Duty free — Export only. Duty & VAT liable UK customers.

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

MAPLE MODELS

(Steve Blake)

"ENGINE CLINIC" try us first for all your spares, repairs and special work requirements.

"BLUE PANTS" kit by Svenson, re-issue of a vintage favourite, sports C/L stunter, 2.5/3.5cc engines, 940mm span. £12.99 + £1.00 part P&P

MODELARSKÉ MOTORY engine collectors book from Czechoslovakia, not written in English but well illustrated, an invaluable reference for lesser known East European engines. £3.95 + 75p P&P

M.V.V.S. 1.49cc neat, small competitive diesel £14.95 + 45p P&P

"MAPLE LEAF" newsletter plus S/H lists. S.A.E. brings copy.

Mail order a pleasure — SAE with Enquiries please
 ACCESS — BARCLAYCARD — HIRE PURCHASE — WELCOME
 Despatch 7 days

16 Maple Road East, Luton LU4 8AE. Tel: 0582-28435

SCOTLAND

EAST AND WEST

Now making personal shopping more practical for the majority of Scottish modellers—but still only as far away as the telephone if it has to be mail-order

Authorised Skyleader Service Agents

DUNNS MODELS

26 GLASGOW ROAD
 PAISLEY TEL. 041. 840.1381

29 SCOTT STREET
 PERTH TEL. 0738 24540

STARTING IN RADIO CONTROL?

THE BEST GUIDE FOR BEGINNERS NEED
 COST NO MORE THAN THE POSTAGE!

...it should be compulsory reading for the non-modeller wishing to take up radio control flying. The whole style is one of utter practicality. That's what *Aeromodeller* wrote about the predecessor to RADIO CONTROLLED MODEL AIRCRAFT, the only guide written specifically for beginners. It assumes you know nothing about aircraft, engines or radio and covers very simple aerodynamics, basic choice between power models and soarers, choice of kit, building hints, glues, soldering, Solarfilm covering, choice of engine, how it works, starting, running-in, choice and installation of radio, 'armchair flying', finding a tutor, learning solo — everything you need to know. Clothbound, 180 pages, 100 photos/drawings/cartoons, it costs £4.25 plus 36p S.A.E. (any size — UK only) and comes with a price list and voucher for £4.25 credit (orders over £50) or substantial discounts on larger orders.

SEND FOR IT BEFORE YOU START MAKING EXPENSIVE MISTAKES!
 SWANSEA MODELS & HOBBIES LTD. (Dept. AM)
 Plymouth Street, Swansea, SA1 3QQ

CO₂ DEVELOPMENTS

Roy Scott of Micro Mold reports on progress with CO₂ motors for radio control

THE TURBOTANK is by way of a simplification on the standard motor and gets rid of the rather vulnerable copper tube plumbing. This gives easy interchangeability between models with a small penalty of a few grams extra weight. With its 'super charge facility,' it does enable extra gas to be carried in a tank which is the same 3cc capacity as the standard engine's tank. This offers either a longer motor run at normal power settings compared with the standard engine, or a more protracted higher power run at a higher rev setting. For readers' interest we will, towards the end of 1981, have two larger sizes of TurboTank — 6 and 9cc versions — the two larger sizes will also adapt to the higher capacity Modela engine.

Incidentally, I was flying a simple single function proportional R/C model of some 30in. span with a Modela engine and an experimental stretched tank unit 18 months ago. Flights were very successful and averaged about three minutes' duration even in quite windy conditions. I still have the model but time and the weather have meant it has remained in the 'hangar' of late. More recently a local friend has flown a two channel CO₂ model at an indoor meet, this was powered by a Modela in the nose and a TurboTank on a pod with Cannon radio, flights were only short but control was excellent.

Before I move to the news of developments on larger motors, I would mention that we have recently produced several prototype heat exchanger Telco engine cylinder heads, for the TurboTank. These indicate a further ten to 20 per cent improvement in performance. This development even gets rid of the current small copper tube from tank to cylinder head. We have to carry out further tests and tooling before this can be put on the market, but we are constantly experimenting with CO₂ matters. For some time the standard motors have been fitted with a modified design piston which proved to be an improvement on the original.

I noticed Dave Hipperson's remarks on the piston change in his TurboTank test, he probably had an early TT3000 as we fitted the new piston to these but at the beginning noticed later that, on a 'super charge,' performance with some motors was not up to scratch. The essence of this was the discovery that the extra pressure of the 'super charge' was slightly deforming the new piston lip so we now use the original piston

in TurboTanks and the new one only in standard motors. Hence Dave probably found the performance better when he married his unit with an older engine which did not have the new piston! Incidentally, the TurboTank on its own is now available for fitting to an existing Telco engine — we call this the TT Retro unit.

One of our other modifications since taking over the Telco manufacture has been to make some subtle changes to the head valve seat angle, which does now reduce head leak problems to a minimum. All Telco engines have a two-stage test during manufacture and are run in on a special turntable multi-motor fixture. Each one is really hand built — that is why the price may appear slightly high for such a small motor, but it really is a precision assembly.

Perhaps of even greater interest to modellers is the progress of our designer with larger CO₂ power units and 'Powermaster' Tank Capsules. This development has been progressing now for many months but at last is reaching fruition and by the time this appears in print we expect to have carried out the first flying trials with a couple of R/C models, using two and three channel control.

I think it best to quote from the designer's recent notes to give you some idea of progress with a 8cc twin cylinder (i.e. 12 times the swept volume of a standard Telco engine), which is both neat and attractive in appearance as you can see from the photographs.

Plane layout

Illustrated overleaf is the fuselage outline (with T35 powerplant in its maximum 150cc length superimposed) and the wing of the 52in. span model which is now 70 per cent built for flying trials. I may name it 'Hush Buggie' to emphasise its quietness and fly-for-fun quality. This photo is intended to illustrate the sort of sports-model

design suitable for quite-robust CO₂ R/C models, having an all-up weight of around 29oz., a wing area of 340sq. in. with a max. 7in. chord to give it an aspect ratio of eight to one for aerodynamic efficiency, and a slim sleek fuselage for low drag. By means of a lifting tailplane the wing loading is only 10.5oz./sq. ft. and the CG can thereby be at 50-60 per cent of wing chord — which allows the radio (two channel Cannon of total weight about 4½oz.) to be installed 5in. behind the wing TE, for easy access without having to remove the wing. Note the wing section: it is named *Hagel* after the world-class power duration flyer who designed it for this sort of wing loading, low drag, a turbulating sharp leading edge, and a flying speed of about 20mph. In flight this should give it an apparent scale speed of about 160mph — i.e. about right for a light plane such as a Cessna at high cruising speed.

T35 Powermaster with E25/2 engine

So named because its two cylinders are each .025cu. in. making .05 total = 0.82cc. We are now making the working T35 Powermaster which is the closest we could get to the ideal 36mm diameter for the production T36, having scoured the country for suitable stock aluminium tube and only just having received it. The photo P427 is of a T35 of the maximum 150cc capacity. A T36 would be about an inch shorter for 150cc capacity, whereas a 100cc T36 would be a *further* three inches shorter (and suitable for shorter R/C and C/L flights of about three-four minutes), and a 50cc T36 yet another three inches shorter and suitable for free-flight power and light control-line. The production 150cc T36 will weigh about 5oz., the 100cc version about 3½oz. and the 50cc about 2½oz.

The engine is the twin, developed over a long period, which weighs just 2oz. and which will swing a 10-11in. by about 8in. pitch prop at 3,000rpm cruise (3,600rpm initial for take-off) to generate ten watts of cruising shaft power (17 watts initial at



The low cost rechargeable dispenser, that will be on the market in 1982.

take-off) i.e. roughly ten times the power of a Telco TurboTank 3000, for five times the length of power run with a 150cc Powermaster — making 50 times the available energy of a TurboTank 3000. This would be suitable to power a 20 to 30oz. plane for four-six minutes, provided it is of high aerodynamic efficiency with a wing loading preferably around 10oz./sq. ft. and up to perhaps 12-13oz./sq. ft. at most. Higher loadings are possible, if the engine power is turned up, but flight duration would fall in proportion.

The prop shown is not ideal, but we will have made a fibre glass propeller that we have had computer-designed by Professor Larrabee of MIT in America (who designed the propeller for the successful Gossamer Albatross cross-Channel flight) in time for flight trials.

The engine exhausts through a 'sound modulator' fitted in the crankcase. (seen under the engine in the photo) which creates a sound similar to the full-size light-plane engine though, of course, a great deal quieter.

The engine can be supplied with only one working cylinder (the other being either a dummy or absent altogether — so reducing the engine weight from 2oz. to about 1½oz.) for use in lighter models up to about 16oz. all-up weight, when CO₂ consumption will be reduced by half. For a 100cc Powermaster, the present cost of a full liquid CO₂ charge would be about 30p. A parallel commercial project now underway aims to reduce this to approximately by 1982 and to under 10p. For a 50cc Powermaster these costs would be halved, thereby falling to about 5p for a liquid charge (and about 2p for a gas charge) by 1984. This is less than the current CO₂ cost for a TurboTank 3000 super-charged from a Sparklets bulb, for a power unit of over 16 times the CO₂ capacity.

'Dornier 25' - This is a 44in. span near-scale model fitted with a 100cc Powermaster and E25/2 CO₂ engine. With two-channel Cannon Radio this leads to a wing-loading of 13.5oz./sq. ft. which is the recommended maximum for easy flying. This model has leading-edge slats and fixed 20° flaps on its inboard trailing edges — to increase the lift coefficient and thereby permit flight at under 20mph so as to preserve the appearance of the full-size aircraft flying at about 160mph. However, the additional drag of these devices (and of the rather bulbous fuselage) is expected to reduce flight duration to about 70 per cent of that of a sleek model, if each had the same 100cc Powermaster and E25/2 engine.

'Light low-cost CO₂ dispenser'

Opposite is a prototype of a CO₂ cylinder holding some 250 grams of CO₂ when full (i.e. 31 times as much as a conventional eight gram Sparklets bulb), being a proposed replacement design for the heavy steel CO₂

The propeller shown fitted to the E25/2 motor, is not the one specially designed by Professor Larrabee of MIT in America. Tests have shown that this new propeller will be over 20 per cent more efficient at a 20 mph flying speed than conventional designs.



cylinders used in 'Sodastream' and similar domestic fizzy-drink makers — and only one third of the weight, so making it much easier to handle when filling a relatively delicate CO₂ powered model. It is expected that this new design dispenser will be available in 1982 at an initial 'once only' retail price of around £6-£7, i.e. about 60 per cent that of the present heavy steel types, and that, thereafter, exchange-refills will cost less than £1.50 compared with approaching £2 for the present ones. This would give about five-six liquid fills of a 100cc Powermaster — or over 12 gas fills — or twice those numbers of fills into a 50cc Powermaster.

Another version is under development, being only two-thirds the length of the one in the photo but 18 per cent fatter — to hold nearly as much CO₂ whilst being small enough to slip into a jacket or coat pocket. Further developments are underway to reduce the CO₂ cost by a further 50 per cent by 1984 — so making CO₂ as cheap and ultimately cheaper than many glo-fuels.

Finally our designer feels I should try to explain, for Aeromodeller readers, just how the CO₂ Powermaster works, in simple terms, as he thinks that the article from 'Chartered Mechanical Engineer' referred to in 'Free Flight Scene' might have confused the picture somewhat.

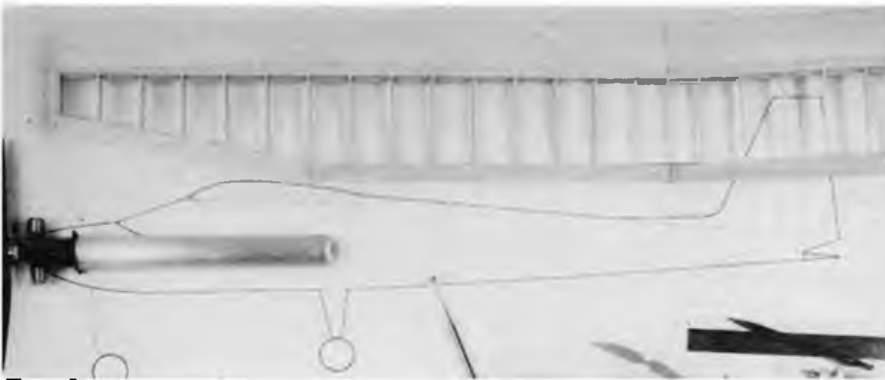
How it works

'The Powermaster's CO₂ tank has a jacket or 'shell' around it containing a 'buffer liquid' which is actually a heat storage substance. Rather than being a 'barrier' against the surrounding atmosphere as mentioned in the Free Flight Scene article, it readily accepts heat energy flowing into it from the surrounding atmosphere, mainly between flights, and stores that energy for the next flight. This happens automatically and naturally by allowing the Powermaster to 'rest' for a few minutes between flights so that it can warm up from about 5°C (41°F) to about 10°C (50°F) allowing the heat storage substance to melt. It has a melting point of 7°C (45°F) and, as it melts, it stores a lot of heat and energy at the constant temperature of its melting point, this heat energy being known as its 'latent heat of fusion and hydration.' To allow this heat to flow into the heat storage substance

from the surroundings, the shell of the Powermaster is made of a high thermal conductivity alloy — to permit easy inflow of heat rather than to provide a barrier against it.

When the CO₂ engine is started for flight, the Powermaster starts to cool down (in the same way as ordinary CO₂ tanks do) but, when it falls to 7°C — after about 20 seconds for take-off and climb to altitude — the heat storage substance is automatically 'triggered' to release its heat energy. This heat energy flows inwards to the inner CO₂ tank and to the liquid CO₂ inside it, to prevent the CO₂ from getting any colder and to provide the heat energy needed to 'keep it boiling' — just like the fire needed for a steam engine's boiler. Again, this heat flow is at the constant temperature of the heat storage substance's melting point of 7°C, thereby keeping the liquid CO₂ in the tank at close to 7°C and the CO₂ gas pressure steady at about 40 bar (600psi). By comparison, a conventional CO₂ tank without a heat storage substance around it will cool down continuously throughout the flight, to as low as -20°C (-4°F), at which temperature the CO₂ gas pressure will fall to only 20 bar (300psi) and cause a major loss of engine power. For the more scientifically-minded readers, the 'Latent heat of fusion and hydration' of the heat storage substance is harnessed so as to supply the 'Latent heat of evaporation' of the CO₂, so the process is called 'Latent heat exchange' and the power plant is called a 'Latent energy motor.' In fact, Powermaster has an internal heat exchanger which not only boils the liquid CO₂ at about 7°C but also 'superheats' the resulting CO₂ gas to about 10°C and expands it to a much greater volume. This increases flight duration and also prevents the formation of solid CO₂ 'dry ice' crystals inside the engine — which would otherwise abrade the piston and reduce engine life considerably.

Also, having the heat storage substance means that you don't have to wait for a warm 'CO₂ flying' day! It always provides its heat energy at the same temperature, summer or winter. At most you may have to wait a few more minutes between flights on a cold day for the heat storage substance to melt, or — if you can't wait — warm the



Powermaster in your hand or pocket: it is designed for quick release from the model, and will snap back in place in a couple of seconds.

The net effect of all this is to give the CO₂ engine — after an initial surge of power for a snappy take-off and climb — a substantially steady power output during the main cruising stage of flight, rather than the continuously-declining power of a conventional CO₂ engine, and to allow power outputs (with the E25/2 engine) ten times greater than the Telco TurboTank 3000 and — ultimately with CO₂ engines of perhaps 2.5cc to 5cc capacity (say .15 to .30cu. in.) — about 50 times greater power output, to allow full aerobatic capability in a four to six channel 'pattern' model weighing perhaps 3-5lbs.

Before we reach that stage (maybe in the late 80's?) the present up to 150cc Powermaster and E25/2 engine will power light

Above: layout of test model which will be fitted with a 150cc Powermaster. Right: Dornier 25 scale model as described in the text.

sports and scale R/C and C/L models up to 2lbs. weight with light aerobatic capability, at reasonable cost. Moreover, an engine servo is not really necessary because the power output is naturally 'tailored' to the R/C or C/L flight pattern, i.e. a power surge for take-off and climb, a steady 'plateau' for cruise manoeuvres and simple stunts, and a gentle decline for approach and landing — all looking and *sounding* like a full-size light aircraft, but very much quieter."

There is obviously still further development to be carried out. Providing necessary

and quite large funds are available we hope to bring this new concept in CO₂ to the market. Although the power weight ratio is not as good as i.c. engines it is considerably better than electric flight. CO₂ can bring back model flying to the parks and small open spaces, no objectionable noise, no messy gummy fuel, no glo-battery, no starter motor and battery, no tricky carb adjustments — first flick every time start. We feel such a concept should have worldwide appeal to sports flyers of all kinds — R/C, Free Flight and C/L.

TTC

TITAN TRANSFORMERS AND COMPONENTS,
DEPT. AM, CENTRAL HALL CHAMBERS,
DUNCOMBE ST.,
GRIMSBY, SOUTH HUMBERSIDE
Mail order only Price includes VAT at 15% Trade enquiries welcomed

BATTERY CHARGERS

For the 1981 season Titans offer you their pocket sized charge units for 2 volt and 6 volt lead acid batteries. The unit is a 13 amp plug-in type with LED indicator. 1/2 amp. Unbeatable value at:

2 volt **£3.00** plus 87p post and packing

6 volt **£3.50** plus 87p post and packing

Offer open whilst stocks last. Allow 28 days for delivery.

NEW
1981-82 EDITION

AEROMODELLER

PLANS

HANDBOOK 1

NEW UP-TO-DATE EDITION INCLUDES LATEST DESIGNS DESCRIBED AND ILLUSTRATED

Model aircraft of all types except radio control, including free flight, control line, scale, aerobatic racing, contest models, helicopters and autogyros.

Price 75p plus 25p p&p

Overseas mail, surface 45p, airmail £1.10
Model & Allied Publications Ltd.,
P.O. Box 35 Bridge St.,
Hemel Hempstead, Herts. HP1 1EE.
Delivery 21 days

To MODEL & ALLIED PUBLICATIONS LTD.
Sales Dept. PO Box 35, 13/35 Bridge Street,
Hemel Hempstead, Herts.

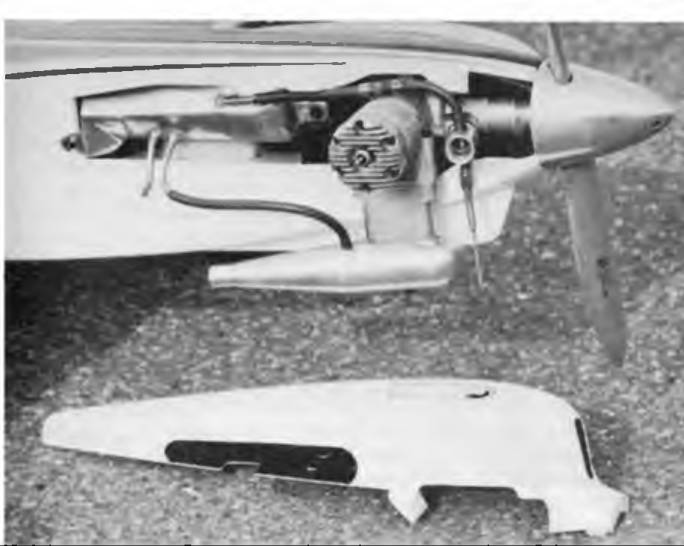
Please supply _____ Copies of

Plans Handbook No. 1

NAME _____

ADDRESS _____

1



Engine cowl removed reveals the specially designed fuel tank, pressure feed from exhaust stack and the home made venturi with OS throttle valve. Note the close fitting spinner and cap on the tank filling vent

do this by reducing the rib spacing from 50 to 48.5mm. The flaps are equal length both sides. Use the landing gear platform pattern as a guide only, you will have to fit this to your own rib bay. The wing is built complete with pushrods and flaps. Lubricate all hinges with petroleum jelly so that they can be sprayed over without danger of sticking.

The flap pushrod is made from piano wire 2mm diameter. The elevator pushrod is a glass fibre tube of 6mm diameter with piano wire ends guided by short beech dowels. The inner ends of the wire are bent and locked into a hole in the tube, so they never come loose.

Fuselage

Note that there are two different fuselage sides. Assembly is in the order: formers, engine bearers, tank compartment floors, top former blocks, plywood doublers, retaining blocks, fuselage sides, rear formers and top blocks (only tack glued). Install engine and pack the space around the engine with block balsa, allowing enough space for cooling. Shape cowl blocks roughly, tack glue to fuselage, shape to final form, remove, hollow inside and install all parts for cowl attachment. Carefully shape all cooling ducts. The air inlet, as shown in the photos, is quite sufficient. Wing installation is always critical. I make

an exact pattern of the upper surface of the finished wing, the pattern ending at the centre line of the airfoil (it looks like the negative form of the upper wing half). Remember to make one pattern for each fuselage side!

Now — as per plan — I draw the exact location (centre line, leading edge, trailing edge) of the wing on the fuselage sides. Using the airfoil patterns, I draw the exact wing outlines. After relieving the rear formers (to clear the pushrod), the wing is installed and the tailplane connected to pushrod. Push tailplane back and forth to find exact position for zero-zero setting. The rest is well known practice. I have used relatively big wheels because I often have to fly on grass. If you don't, you can use smaller wheels and this would help to reduce the weight.

Finishing

I still use my Dupli Color (Spray-can) method. For my special circumstances (backyard spraying) it is still the best solution. But wait until your neighbour has removed his linen from the line. A fuel-proof, clear coat has to be added last. I prefer the early morning hours when the flies are not so aggressive.

Now it is your turn to dream up a new exciting colour scheme. Get some car magazines, lots of white paper, lots of beer, and relax. It sure helps to get into some kind of *Mood Indigo*.

BRITISH NATIONAL CHAMPIONSHIPS

CONTEST CALENDAR

August 28-31, 1981

RADIO CONTROL BARKSTON HEATH

Tx Checking: 7-8pm Friday, 7-8am and 6:30-8:30pm Saturday, 7-8am Sunday
F3A Aerobatics (SMAE Cup): 8:11am, 4-6pm Saturday, 3-5pm Sunday, 2:30-3:30pm Monday
Club 20 (MacGregor Trophy): 11am-4pm Saturday 5-7pm Sunday, 12:30-1:30pm Monday
FAI F3D Pylon (RCM&E Trophy): 8am-3pm Sunday 1:30-2:30pm Monday
Helicopter (Bristow Trophy): 8am-12:30pm Monday

SCALE

R/C Scale (RM Cups): Superscale and Stand-off) 8am-6pm Sunday, 8am-3:30pm Monday (Static judging — 10am-1pm and 2-5pm Sunday, 10am-1pm Monday for Superscale, 9am-1pm and 2:05pm Sunday, 9am-1pm, 2pm-4pm Monday for Stand-off) Note Competitors Briefing at 8am SUNDAY
F/F Superscale (Superscale Trophy): 6:30-8:30pm Saturday or 7-9am Sunday
 (Static judging Sunday and Monday from 1am)
Open Rubber Scale: 6:30-8:30pm Saturday or 7-9am Sunday
 6:30-8:30pm Sunday or 7-9am Monday
 (Static judging Sunday and/or Monday from 10am)

August 1981

Control Line Superscale (Knokke No. 2): 10am-1pm Sunday or 4-7pm Sunday or 10am-1pm Monday
 (Static judging Sunday and/or Monday from 10pm)
Control Line Superscale (Knokke No. 2): 10am-1pm Sunday or 4-7pm Sunday or 10am-1pm Monday
 (Static judging Sunday and/or Monday from 1pm)

RADIO CONTROL CRANWELL

Thermal 'Open' (PAA Trophy): 8am-6pm Saturday
F3B (RM Trophy): 8am-6pm Sunday
Scale: 8am-6pm Sunday
100S: 8am-6pm Monday

CONTROL LINE BARKSTON HEATH

Speed: 10am-5pm Saturday, 9am-5pm Sunday, 9am-3pm Monday
Aerobatic (Gold Trophy): 9am-7pm Saturday, 9am-7pm Sunday, 9am-1:30-12:30-3:30pm Monday
FAI Combat (Whitney Strait Trophy): 10am-7pm Saturday, 10am-7pm Sunday, 10-11am, 12-12:30pm, 3-5 (finals) Monday
A Combat: 10am-5pm Saturday, 10am-6pm Sunday, 10:45-11:30am, 2pm (finals) Monday
FAI Team Race (Davies 'A' Trophy): 11am-3pm Saturday, 3-6:30pm Sunday, 10-10:45am, 1-1:45pm, 3-30 (finals) Monday
Class B Team Race (Davies 'B' Trophy): Times to be advised — dependent on entry
Goodyear Team Race: 3-6:30pm Saturday, 8-11:30am Sunday, 11:30am-12:15pm, 2:20pm (Novices Final), 2:40 (finals) Monday

A Team Race (RAFMAA Trophy): 8-11am Saturday, 11:30am-2:30pm Sunday, 10:45-11:30am, 2pm (finals) Monday
Open Carrier: 12-6pm Saturday, 12-6pm Sunday, 9am-2pm Monday
Mini-Goodyear: 2-4pm Saturday, 1-6:30pm Sunday
Novice Aerobatic: 1-6pm Sunday, 9am-2pm Monday
Junior Aerobatic: 1-6pm Sunday, 9am-2pm Monday
Profile Carrier: 12-6pm Saturday, 12-6pm Sunday, 9am-2pm Monday

ALL COMPETITORS

It is suggested that you check at your particular control for confirmation of times, and other details

- CD Scale R/C — John Adams
- CD F/F Scale — Bill Dennis
- CD C/L Scale — Vic Willson
- CD Thermal — Adrian Barker
- CD Aerobatics — Terry Watson
- CD Club 20 — Gilbert White
- CD FAI Pylon — Keith Hutson
- CD Helicopter — Pat Dubock



Club News...

RETURNING ONCE AGAIN to the question of small field flying. I feel there is great scope here for a renaissance of model flying on the parks and local open spaces which have remained virtually unused by aeromodellers since the upsurge of universal radio. I am sure there are many people who are attracted to aeromodelling, but either through temperament or circumstances do not wish to be involved with large, heavy machines and complex systems. Nor do they wish to become too deeply committed, and you just cannot take up radio flying without doing so. Again, the prospective modellers may desire to pursue his interest on a family basis, and here the casual visit to the nearby open space suits him much better than a solo journey to a distant flying field.

There is a whole range of models, interesting to build and fly, suitable for the small park or common, all of which are featured in this journal. There are the small free flight rubber models, a whole host of glider designs, many interesting vintage designs, and now we have electric and CO₂ power to broaden the scope of small field flying. It should not be overlooked that such power units are often permissible on sites where the power flying ban is specific to combustion engines.

We start off with a nice long report, plus the current newsletter 'Turbulator,' from Mr. A. E. Sweetland, PRO of the **Crawley & DMAC**. First item of news is that the projected flying display at the YDP Summer Fair is off. For what reason: it would cause too much noise around the show ground. What a prissy society we have become for people not to tolerate a little occasional noise in the interest of other people's enjoyment. I think a more robust view of life would do this country a lot of good. Club display models are not usually all that noisy, anyway, and it seems wrong to deny disabled people an unusual and exciting entertainment on such piffling grounds. Even so, the club hopes to put its meaning across with a static display plus a spot of active model building. Meanwhile the club shows the right sort of pertinacity in looking for other means of giving a flying display to the disabled in the area. Mr. Sweetland reminds us that the free flight section is as active as ever. In fact, more so, for they look quite strong on the ground — and even better in the air — this season. A definite challenge for the coveted RAFA Shield (competed for in conjunction with the area free flight meetings) which is now 21 years old. Also reaching that age of discretion is the club itself, and plans to celebrate the event with a summer fly-in/barbecue are in the capable hands of Keith Diamonds.

What of the free flight opposition in the South Eastern Area. Well, the **Maidstone F/F Group** is naturally hopeful of making a showing. The listings on the first two area meetings, published in the club newsletter, seem to put the Maidstone boys well in the running in glider but a little out of things in rubber and power. And what of flying in prickly Ashdown Forest? Well, unlike most creatures of the wild which seek to camouflage themselves, it is suggested that the models be coloured in tones that will show up against the yellow bloom of the gorse and the dusty grass. A particular problem at Ashdown Forest is that models fly for long spells below the skyline, calling for care in choosing the tones and shades of the model to suit all conditions. A last question. What sort of muster can the group expect down in the forest? Well, it seems like six to eight of the 12 club members flying and helping.

In 'Hot Air,' the newsletter of the **Grantham & DMAC**, Tony Brooke's Vintage Column fills in the background to vintage flying and gives advice and help into the exploration into the past for the plan with special appeal. Mostly the vintage emphasis has been on the rubber powered model and the big gassie, but Tony suggests people take a look at some of those huge gliders of the 50's, ideal with a spot of radio control, and also at some of the potent post war power jobs, handicapped then by not using modern trimming know-how and the R.O.G. requirement. Back to the present the club visited the new indoor venue at Kelham Hall, Newark for an area meeting. The hall is

an old monastery with an 85ft. high dome. Just the height you need for the best indoor results as rubber powered models are either going up or coming down — and what scope it gives for the chuckles! Considered to be the next best thing to Cardington. For free flight the area meetings have been hotly contested on the club's home ground of Barkston Heath.

From the **Watford Wayfarers MAC's** newsletter we read of yet another club adding a splash of colour to the model scene with its own logo loaded tee shirts and sweatshirts. Central motif is a red bi-plane. But it is a Cessna 150, belonging to Dave Calo, which has been at the centre of things, searching the countryside for the least hint of a possible flying field. The ground patrol has been taken care of by John Greenfield, armed with a lot of that other sort of greenstuff farmers are fond of. A couple of good sightings made but no on the spot transaction. The search goes on. Meantime it's life as usual on the moor, with anyone with a yen for controlled low flying being given the offer of a few turns with the Flymo.

We are reminded in the **Hemel Hempstead MFC**, newsletter on the manic pace of modern life, when, in a talk to the members given by Sean Bannister on the subject of R/C gliders, there was a mention these most gentle of all model creatures being propelled around a 300 metre course at an average of 100mph. But just what speed you have to accelerate to in order to safely hand launch at Puttenham must be a matter of experiment, but at least the chucker uppers are helped by the new drainage scheme which has greatly reduced the depth of foot sinkage. On flatter Flaunden, though, all is well; the take off area having got the one man and his dog treatment. Much of the newsletter is a reprint from an American model mag, the main feature of which is a frightfully difficult plan of a Focke-Wulf 190, Radio Model. Just the sort of model I could never build, and if I did would never fly.

Mr. G. B. Evans, a member of the **Swansea & District C/L Club** has sent us a piece of realistic photography, the subject of which is a highly detailed, beautifully finished C/L model of a Yak 18, built from APS plan by fellow member, Roy Williams. Mr. Williams is a model builder of long experience and quite a dab at producing the high detailed scale model. The Yak 18 is not just a pretty model though, for fitted with an Enya 35 engine, it has flown very convincingly under the capable pilotage of Mr. Evans.

Truly a model club for all seasons, the **Lee Bees MAC** (Southampton) has added another string to its already well strung bow by acquiring the use of the new Chinook hangar at Fleetlands for indoor flying. The club newsletter, sent along together with a short report by Club Secretary Dave Skerchley, shows a group of modellers in the



Why not try winning yourself a year's subscription to Aeromodeller by entering this month's Caption Challenge - just send your entries to Aeromodeller, P.O. Box 35, Bridge Street, Hemel Hempstead, Herts HP1 1EE — Results October issue

spacious hangar with a suitable array of indoor models: EZBs, Peanuts and a 'Modela CO₂ powered model using Canon radio.' If a radio model has been flown indoors, it is quite an achievement for member Don Eades. Mr. Sketchley is proud of the club's virtuosity, which is given full rein in the well advertised club calendar but admits it is the same old faithfuls who enter anything and everything — 't'was ever thus. Another new venture is 1/2A Combat, a recent event which went down so well that combat has now been included in the club gala programme. Members are awaiting the effects of the extra weaving imported by the ingestion of 'beevies' (beer and beefburgers), a gala day speciality — I like the club emblem — an angry looking, very comic bee.

The newest thing in small field flying is the Wigan 70 formula covering rubber power, glider and CO₂. This mini approach is now being taken up by members of the **Loughborough MFC**, by way of relief from the heavy stuff. The prospects are discussed in Pat's Piece where a few popular designs are recommended. Surely, though, part of the fun of aeromodelling is in designing your own machines, but the modern trend seems to be towards the well prepared kit. In this newsletter, as in many others, there is a good bit of space given over to kit reviewing. You do not need to be a genius to design a model — few designs are startlingly original, mostly they are prepared from empirical data, but it does enable you to do things your way, within your capabilities. However, kit, plan or own design, the comp calendar offers something for all talents, covering thermal soaring, R/C aerobatics, control line stunt, mini Goodyear and combat, and the aforementioned Wigan 70 (simply without peer).

Another club in a self-congratulatory anniversary mood is the **Wharfedale & DAC**, having been in 'circulation' for some 25 years, although flight in the early years was not quite so circulatory — free flight dominating the formative period. Anyway, the long saga is being chronicled in the newsletter, starting from the days when kits were a mere 3/6d. Being the silver jubilee the anniversary will be commemorated with an issue of silver club transfers, suitably inscribed with '25 years.' New tee shirts are in the offing, too, not for anniversary reasons, but because the existing ones display too much meaningless emblem and not enough club advertising 'Wharfedale.' We live in publicity motivated times. All reported in heat by heat detail and racy commentary are the C/L contests held in the early part of the year with the Wharfedale teams showing up well to the fore. Latest news is that the club team of B. Langworth/J. Broadhead has been picked for the British FAI team.

Caught up in our own local flying field problems we are apt to forget the universal appeal of the hobby, and that over our northern



Mr. G. B. Evans of the Swansea & District C/L Club, holding a Yak 18 built by fellow club member Roy Williams.

border quite a lot of healthy modelling activity goes on. From Hugh McQuiston, newsletter editor of the **Hamilton MFC**, comes a report on the style of things in the land of the thistle. Membership is around the 30 mark with that rare ingredient, the junior member, in goodly supply. No club house to boast, but a good grass C/L site in Strathclyde Country Park, a free flight site on East Kilbride Moor, and access on Mondays to Hamilton Town Hall for indoor flying. Free flight activity appears to be on the up and up at present, seemingly to the detriment of control line. The club has done particularly well in SAA, f f events — the championship being in the bag already. Still a strong interest in C/L stunt which the club is eager to promote with the ultimate aim of an inclusion for stunt in the Scottish C/L Nationals at Kirknewton Airfield on August 8/9. Hamilton's own stunt event is scheduled for September 20 at Strathclyde Park.

'Crosswinds,' the newsletter of the **Cleveland Free Flight Society**, is given over to one vintage subject. Not a model but one of the finest and most advanced aircraft of its day: the *Gloster Meteor*. Not, we should imagine an ideal modelling project, though — jet simulation not being everyone's cup of tea. It is an indication of the sort of research that goes into the scale model these days, just another of the now so many approaches to model flying that operate in these technical times. Yet something of the traditional values Model Meet where old fashioned Wakefield, glider and power are all featured.

East Anglian News comes up with reports of yet more diabolical machinations of the band citizenry. Apart from flooding the 27MHz range with their maniac brand of inane chatter, the babbling boyos are encroaching upon our very own, sacrosanct 35MHz, with talk of legal loopholes giving access to that model flying only frequency. No matter, you can still take up chuck gliding. ("Hey! you can't fly that thing over here."). On the free flight front the Watton boys have been playing host to some of the dispossessed Bassingbourn flyers. Bob Wells and Martin Dilly taking the long trip to the remote Watton field. Nice weather but capricious lift.

News from the **Chelmsford MFC**, is of a steadily growing membership, which is now nudging the 75 mark, with a healthy club night turn out of about 60. Such an expansion in membership has brought its problems, not least the need to tighten up on radio flying discipline — the casual approach of the Sunday morning get-together no longer appropriate. Not all radio, though: one of the club's specialities is combat, for which an 1/2A event was held in April in King's High Meadow, attracting seven entries. To keep in the running one contending flyer flew a team racer as his second model, and even obtained a couple of cuts. (It is not said where).

Which is about all for this month. Fingers crossed for a break in the weather.

Clubman



This month's winner came in without a name or address — please let us know who you are! Runners-up were: "NOW THAT YOU MENTION IT, THE ELEVATOR DOES NEED TRIMMING A LITTLE" from G. Green, High Wycombe; "I THOUGHT HE SAID HE WAS GOING TO PLAY ON THE WING, NOT IN GOAL" from H. Johnson, Sleaford, Lincs.; "BLAST! I FORGOT IT WAS A CANARD" from Sebastian Robinson, Glasgow; "DANCE WITH ME, BABY" from D. Carlos Garcia Sanjuan, Spain.

The photograph was first published in the August 1955 issue of *Aeromodeller*. It shows Mexican modeller Jose Rivero flying his own design model at the Mexican Nationals.

SHOP GUIDE

READERS PLEASE NOTE:

Due to soaring postal charges many retailers are unable to answer postal enquiries unless accompanied by a stamped addressed envelope.

• Mail Order Welcome

AUSTRALIA

MELBOURNE 3000 Tel (347) 8029
RIVERSIDE HOBBY CENTRE
16 LITTLE LATROBE STREET
9 am-5:30 pm Mon-Fri
9 am-12 noon Sat

AVON

BRISTOL Tel (0272) 557764
AVONAIRE MODELS
351 CHURCH ROAD ST GEORGE
Mon-Sat 9-6 pm
Closed all day Wednesday
Late night Friday - 7 pm

BRISTOL Tel (0272) 662544
BEV'S MODELS
35 WEST STREET
BEDMINSTER
Mon-Thurs 10 am-6 pm
Wed 10 am-1 pm
Friday 10 am-7 pm
Sat 10 am-5 pm

BRISTOL Tel (0272) 716522
FRED COULSON MODELS
515 WELLS ROAD
HENGROVE
Mon, Tues, Thurs & Sat 9 am-5:30 pm
9 am-8 pm Friday
Closed all day Wednesday

BEDFORDSHIRE

BEDFORD Tel (0234) 60884
J & A MODELS
6 WENDOVER DRIVE
Tues-Sat 10:00-6:00
Sun 10:00-1:00
Monday closed all day

BIGGLESWADE Tel (0767) 313840
IVEL MODELS & HOBBIES
94 96 SHORTMEAD STREET
Mon-Sat 9:00-6:00
Wed closed
Friday 9:00-9:00

LEIGHTON BUZZARD Tel (0525) 376134
DH MODELKRAFT
106 NORTH STREET, LU7 7ET
Tues-Sat 9:00-6:30
Friday 9:00-8:00
Half day Monday

LUTON Tel (0582) 36218
TAYLOR & MCKENNA
73 ARNDALE
Open 9 am-5:30 pm Mon to Thurs
9 am-6 pm Fri and Sat

BERKSHIRE

READING Tel (0734) 51558
READING MODELS
5 CHATHAM STREET
9 am-5:30 pm each weekday

WINDSOR Tel (07535) 56321
WINDSOR MODEL SHOP
45 ALBANY ROAD
Open Mon-Sat 9 am-6 pm
Late night Fri 7 pm
Half day Wed 1 pm

BUCKINGHAMSHIRE

AYLESBURY Tel (0296) 85752
TAYLOR & MCKENNA LTD
46 FRIARS SQUARE
Mon-Thurs 9 am-5:30 pm
Fri-Sat 9 am-6 pm

BLETCHLEY Tel (0908) 70478
TAYLOR & MCKENNA LTD
16 THE CONCOURSE
BRUNEL CENTRE
Mon-Thurs 9 am-5:30 pm
Fri-Sat 9 am-6 pm

CAMBRIDGESHIRE

CAMBRIDGE Tel (0223) 59620
MODEL MANIA
17 KING STREET
Open 9:30 am-5:30 pm
Mon-Sat Inc Lunchtime

CHESHIRE

MACCLESFIELD Tel (0625) 29467
HOBBY CRAFTS
(MACCLESFIELD) LTD
PARK MILL
HOBBSON STREET
Open 9:30-5:30 Mon-Sat

SALE Tel (061 962) 4561
HOBBY WORLD
200A MARSLAND ROAD
Mon-Sat 9:30-6:00
Wed early closing

STOCKPORT Tel (061 480) 5478
THE MODEL SHOP
280 WELLINGTON ROAD SOUTH
Open Mon-Sat 9 am-5:30 pm
Closed Tuesday

CLEVELAND

MIDDLESBROUGH Tel (0642) 211212
HOBBYDROME
283 LINTHORPE ROAD
Open 9:30 am-5:45 pm
Late night Friday 8 pm
Closed Wed

DERBYSHIRE

DERBY Tel (0332) 46579
THE BALSA TREE
16 18 HOWE STREET
DE3 3ER
Open Mon-Sat 9 am-8 pm
Tues 4 pm-8 pm

DEVON

EXMOUTH Tel (039 52) 72540
EXMOUTH MODELS
78 EXETER ROAD
Mon-Sat 9:00-6:00

PLYMOUTH Tel (0752) 53330
RUNWAY SOUTHWEST
16 DEVENPORT ROAD
STOKE, PLYMOUTH
Mon-Sat 9 am-6 pm
(Late night Friday 8 pm)

TORBAY Tel (0803) 521767
MANSEL'S MODELS
PALACE AVENUE, PAIGNTON
Open 9:15 am-5:30 pm
Mon-Sat inclusive
Half day Wed
Late night Fri 7 pm

DORSET

BOURNEMOUTH Tel (0202) 424038
R F AUSTIN MODEL SHOP
SHOP 156 SEABOURNE ROAD
SOUTHBOURNE BHS 2JA
Open 9 am-5:30 pm Mon-Sat
Closed 6 pm Thurs-Fri
Half day Wed

BOURNEMOUTH Tel (0202) 517032
J & H MODELS
823 WIMBOURNE ROAD
MOORDOWN, BH9 2BA
Mon-Thurs 9 am-5:30 pm
Fri 9 am-6:30 pm Sat 9 am-6 pm

BOURNEMOUTH Tel (0202) 763480
WESTBOURNE MODEL CENTRE
59 SEAMOOR ROAD
WESTBOURNE
Open 9 am-5:30 pm Mon-Sat

ESSEX

BRENTWOOD Tel (0277) 226787
ARNOLD'S GIFT CENTRE
4 HIGH STREET
Open 9 am-6 pm
Half day Thursday

CHELMSFORD Tel (0245) 352553
CHELMSFORD MODEL CO LTD
204 MOULSHAM STREET
Open Mon-Sat 9 am-5:30 pm
Wednesday 9 am-2:30 pm

HARLOW Tel (0279) 21697 & 418817
K & C MODELS
PARDON MILL
PARDON MILL LANE
Mon-Sat 9:30-6:30
Sunday 10:00-12:00

HORNCHURCH Tel (040 24) 40016
RADIO ACTIVE
94 ARDLEIGH GREEN ROAD
Open Mon, Tues, Thurs & Sat
9 am-6 pm, Fri 9 am-7 pm
Half day Wednesday

HAMPSHIRE

FAREHAM Tel (0329) 234136
G M H BUNCE & COLTD
206 WEST STREET
Open 9 am-5:30 pm. Closed Wed

PORTSMOUTH Tel (0705) 25049
RAY BROWN MODELS
10 KINGSTON ROAD
Open 10 am-5:30 pm
Lunch 1 pm-2:30 pm
Closed all day Wed

PORTSMOUTH Tel (0705) 733208
SOUTHSEA MODELS
35 HIGHLAND ROAD
SOUTHSEA
Open Mon-Sat 10:00-6:00

SOUTHAMPTON Tel (0703) 617849
EASTLEIGH MODEL CENTRE
2e HIGH STREET, EASTLEIGH
Open 9 am-6 pm. Half day Wed.

HERTFORDSHIRE

HATFIELD Tel (070 72) 63404
DESIGN & HOBBIES
5 MANOR PARADE
Tuesday-Friday 9:30 am-6 pm
Closed 2-3 pm for lunch
Saturday 9:30 am-5:30 pm
Closed all day Monday

HEMEL HEMPSTEAD Tel (0442) 53691
TAYLOR & MCKENNA LTD
203 MARLOWES
Mon-Thurs 9 am-5:30 pm
Fri-Sat 9 am-6 pm

ST ALBANS Tel (0727) 53954
S A M S
12 HATFIELD ROAD
Mon-Fri 9 am-6 pm
Sat 9 am-5:30 pm

HONG KONG

HONG KONG Tel 3 680507
RADAR CO LTD
3 OBSERVATORY ROAD
TSIMSHATSUI, KOWLOON
Open 10 am-7 pm. Closed Sundays

HONG KONG Tel 3 684184
WINNING MODEL & HOBBY SUPPLIES
2a AUSTIN AVENUE
KOWLOON, HONG KONG
Open 10 am-7 pm. Closed Sundays

ISLE OF WIGHT

RYDE Tel (0983) 64051
WIGHT MODELS
 84 HIGH STREET PO33 2SU
 Open daily 9 am, through lunch till
 5.30 pm except Sunday and Monday
 closed all day

PRESTON Tel (0772) 51243
PRESTON MODEL CENTRE LTD
 (Opposite Polytech)
 2 FYLDE ROAD
 Open 9.30 am-6 pm Mon-Sat

LONDON Tel (01 703) 4562
MODEL AIRCRAFT SUPPLIES LTD
 207 CAMBERWELL ROAD SE5
 Open Mon-Sat 10 am-6 pm
 Fri 10 am-7.30 pm
 Closed all day Thursday

NORTHANTS

NORTHAMPTON Tel (0604) 31223
THE MODEL SHOP
 230 WELLINGBOROUGH ROAD
 Open 9 am-6 pm
 Half day Thursday

KENT

BEXLEY Tel (0322) 522308
BEXLEY MODEL CENTRE
 18 BOURNE ROAD
 Mon-Sat 9.00-5.30
 Thursday closed all day

WIGAN Tel (0942) 45683
G FORSHAW & SON
 58 MARKET STREET
 Open 9.15 am-5.45 pm
 Early Closing Wednesday

LONDON Tel (01 653) 4943
NORWOOD JUNCTION
MODELS LTD
 3 ORTON BUILDINGS
 PORTLAND ROAD SE25 4UD
 Open 9.30 am-1.30 pm -
 2.30-6 pm Mon-Sat
 Early closing Wednesday 1 pm

NORTHAMPTON Tel (0604) 35718
STAGG MODELS
 22 BRIDGE STREET
 Open 9 am-5.30 pm
 Early closing 2 pm Thursday
 Late night opening Friday until 7 pm

LEICESTERSHIRE

BROMLEY Tel (01 460) 0818
AVICRAFT LTD
 15 CHATTEPTON ROAD
 Open 10 am-6 pm
 Not closed for lunch
 except Wed 10 am-1 pm

HINCKLEY Tel (0455) 30952
PUNCTILIO MODEL SPOT
 6 WATERLOO ROAD
 Mon 9.15 am-7 pm
 Tues-Wed-Thurs 2 pm-7 pm
 Fri 9.15 am-7 pm
 Sat 9.15 am-5 pm

LONDON Tel (01 228) 6319
F F RUSS
BATTERSEA RISE SW11
 Open Fri till 7 pm
 Other days 9 am-6 pm
 Early closing Wednesday 1 pm

NORTHAMPTON Tel (0604) 27726
TAYLOR & MCKENNA LTD
 41 43 PRINCES WALK
GROSVENOR CENTRE
 Mon-Thurs 9 am-5.30 pm
 Fri-Sat 9 am-6 pm

CANTERBURY Tel (0227) 69888
THE MODEL SHOP
 83 NORTHGATE CT1 1BA
 Open 9 am-5.30 pm inc Sat
 Closed all day Thursday

LEICESTER Tel (0533) 666363
THE LEICESTER MODEL
CENTRE LTD
 STAFFORD STREET CORNER
 MELTON ROAD
 Mon-Sat 9.00-6.00

LONDON EAST

LONDON Tel (01 520) 7397
ARNOLD'S GIFT CENTRE
 132 134 HOE STREET, E17
 Open 9 am-6 pm Mon-Sat
 Closed Wednesday

NOTTINGHAMSHIRE

NOTTINGHAM Tel (0602) 50273
GEE DEE MODELS LTD
 19 21 HEATHCOTE STREET
OFF GOOSEGATE
 Open 9.30 am-5.30 pm
 Early closing Thursday

LINCOLNSHIRE

MAIDSTONE Tel (0622) 51719
THE MODEL SHOP
 19-23 UPPER STONE STREET
 Open 9.30 am-1 pm, 2.30 pm-
 5.30 pm Closed all day Wed

STAMFORD Tel (0780) 4524
SPORTS & HOBBIES
 4 ALL SAINTS STREET
 Open 9 am-5.30 pm
 Half day Thursday

MIDDLESEX

HARLINGTON Tel (01 897) 2326
RADIO CONTROL MODEL
CENTRE
 214 HIGH STREET
 Mon-Thurs & Sat 9.15 am-
 6 pm, Fri 9.15 am-7.30 pm
 Closed Wednesday

WORKSOP Tel (0909) 472855
RUSSELL MODELS
MODEL CENTRE RYTON STREET
 Open Mon-Sat 9.30 am-5.30 pm
 Thursday 9.30 am-1 pm

LONDON NORTH

TUNBRIDGE WELLS Tel (0892) 31803
BALLARDS
 54 GROSVENOR ROAD
 Mon-Sat 9.15-1.00 2.15-5.30
 Wednesday 9.30-12.30

BISHOPSGATE E1 Tel (01 283) 9870
HADLEY HOBBIES
 131 MIDDLESEX STREET
 Sun 9.30 am-2 pm
 Mon-Fri 9 am-6 pm
 Vary close to Liverpool Street
 Station

HARROW Tel (01 863) 9788
THE MODEL SHOP
 190 194 STATION ROAD
 Mon-Sat 9.30-6.00
 Wednesday 9.30-5.00

OXFORDSHIRE

OXFORD Tel (0865) 42407
HOWES MODEL SHOP
 9 10 BROAD STREET
 Open 8.45 am-5.30 pm
 6 day week

TUNBRIDGE WELLS Tel (0892) 36689
E M MODELS
 42 CAMDEN ROAD
 Mon-Sat 9 am-5.30 pm
 Closed Wed

CAMDEN TOWN Tel (01 485) 1818
AERONAUTICAL MODELS
 39 PARKWAY NW1
 9.15 am-5.30 pm Tues-Fri
 9.15 am-5 pm Sat
 Closed all day Monday

ISLEWORTH Tel (01 560) 0473
RADIO CONTROL SUPPLIES
 581 LONDON ROAD
 Open 9 am-6 pm Fri 9 am-8 pm

SCOTLAND

GLASGOW Tel (041 339) 0994
U CONTROL MODELS
 171 BYRES ROAD G12
 Open Mon-Sat 9 am-6 pm
 Closed all day Tuesday

LANCASHIRE

FARNWORTH Tel (0204) 74688
JOYCRRAFT
 3 BOLTON ROAD, MOSES GATE
 Open Mon-Sat 9 am-6.30 pm
 Closed all day Wednesday

LONDON Tel (01 607) 4272
HENRY J NICHOLLS & SON LTD
 308 HOLLOWAY ROAD N7
 Open Mon-Sat 9 am-5.30 pm

WEMBLEY Tel (01 902) 4823
WALLY KILMISTER LTD
 6 & 7 NEED PARADE
 Mon-Sat 9.5-30
 Closed Wednesday

PAISLEY Tel (041 840) 1381
DUNNS MODELS
 26 GLASGOW ROAD
 Mon-Sat 9.00-5.30
 Tuesdays closed

LIVERPOOL Tel (051 709) 8039
STAN CATCHPOLES
MODEL WORLD
 85 BOLD STREET
 9.30 am-5.30 pm Six days

MILL HILL Tel (01 959) 2877
H A BLUNT & SONS LTD
 133 THE BROADWAY
 NW7 4RN
 Open 9 am-6.30 pm Mon-Fri
 9 am-6 pm Saturday

KINGS LYNN Tel (0553) 63164
BARNEY S MODEL SHOP
 SOUTH EVERARD STREET
 Open 9 am-6 pm

PERTH Tel (0738) 24540
DUNNS MODELS
 29 SCOTT STREET
 Mon-Sat 9.00-5.30
 Wednesday Closed

LONDON SOUTH

MANCHESTER Tel (061) 8341 3972
THE MODEL SHOP
MANCHESTER
 209 DEANS GATE
 Mon-Fri 9.30 am-6 pm
 Sat 9 am-5 pm

ELTHAM Tel (01 850) 4324
ELTHAM MODELS
 54 WELL HALL ROAD SE9
 Mon-Sat 10 am-5.30 pm
 Closed Thursday

NORWICH Tel (0603) 42515
GALAXY MODELS
 88 CATION GROVE ROAD
 Open 6 days a week

STAFFORDSHIRE

BURTON-ON-TRENT Tel (0283) 64240
J & N MODELS
 22 DERBY STREET
 Open 9 am-5.30 pm
 Closed Wednesday

SUSSEX

STAFFORD Tel (0785) 3420
JOHN W BAGNALL LTD
18 SALTER STREET
9 am-5 30 pm
Closed all day Wednesday

BRIGHTON Tel (0273) 418225
HARRY BROOKS
15 VICTORIA ROAD
PORTSLADE
Open every day except Sun
8 30 am-5 45 pm (no half day)

WEST MIDLANDS

BIRMINGHAM 10 Tel 021 772
BOB S MODELS 4917
520 522 COVENTRY ROAD
SMALL HEATH
Open 9 30 am-6 pm
Early closing Wed 1 30 pm

DONCASTER Tel (0302) 62524
B CURTISS & SONS
40 DUKE STREET
Open 9 am-5 30 pm
Closed all day Thursday

STOKE-ON-TRENT Tel (0782)
JOHN W BAGNALL LTD 263574
30 PICCADILLY, HANLEY
9 am-5 30 pm
Closed all day Thursday

CRAWLEY Tel (0293) 21921
HEATHER CRAFT
60 HIGH STREET
Open 9 am-5 30 pm Mon-Sat
Closed all day Wednesday

BIRMINGHAM Tel (021 3731)
5945 3535
JIM DAVIS MODELS
311 313 MARSH LANE
ERDINGTON
Mon-Sat 9 30 am-6 30 pm

DONCASTER Tel (0302) 27255
EVANS MODEL CENTRE
D C EVANS & CO
HOLDINGS LTD
65 SILVER STREET
Open Mon-Sat 9 am-5 30 pm
Closed all day Thursday

WOLVERHAMPTON Tel (0902)
WOLVERHAMPTON 26709
MODELS & HOBBIES
BELL ST., MANDERS CENTRE
9 am-5 30 pm Mon-Sat
Early closing Thursday

EASTBOURNE Tel (0323) 29677
RAFFLES
56 SUSANS ROAD
Open Mon-Sat 9 am-6 pm
Sunday 9 30-12 30

COVENTRY Tel (0203) 76409
MODEL CRAFT
61 SPON END
Open Mon-Fri 10 am-5 30 pm
Sat 9 am-5 30 pm
Closed Wednesday

KEIGHLEY Tel (0535) 65662
AIREDALE MODELS
156 STATION BRIDGE
BRADFORD ROAD, KEIGHLEY
WEST YORKS
Mon-Sat 9 30 am-6 pm Tues
closed Thur 9 30 am-7 pm

SUFFOLK

IPSWICH Tel (0473) 51195
BOWMANS OF IPSWICH
37 39 UPPER ORWELL STREET
Open 9 am-5 30 pm Mon-Sat
Early closing Wednesday

EAST GRINSTEAD Tel (0342)
SOUTH EASTERN MODELS 21750
5 THE PARADE
LONDON ROAD, FELBRIDGE
Open Mon-Sat 9 30 am-5 30 pm
Closed Wednesdays

SOLIHUL Tel (021 744) 3374
SHIRLEY MODEL SUPPLIES
62 STRATFORD ROAD
Open Tues-Sat 9 am-2 pm & 3-6 pm
Late night Thurs 8 pm

LEEDS Tel (0532) 646117
FLYING MODELS
88 CROSSGATES ROAD
CROSSGATES
Mon-Sat 6 am-6 pm
Sun 8 am-1 pm

IPSWICH Tel (0473) 79279
GALAXY MODELS
160 FELIXSTOWE ROAD
Open 6 days a week

WORTHING Tel (0903) 207525
SUSSEX MODEL CENTRE
10 TEVILLE GATE
9 am-5 30 pm Open six days a week
Monday to Saturday

WALSALL Tel (0922) 23984
GEOFF PARKER MODELS
123 WOLVERHAMPTON STREET
Mon-Sat 9 00-5 30

LEEDS 2 Tel (0532) 456060
JUST MODELS
99 THE MERRION CENTRE
(Georgian Arcade)
Open Mon-Sat 9 30 am-6 00 pm

TYNE AND WEAR

SUDBURY Tel (0787) 76825
THE MODEL CENTRE
51 GAINSBOROUGH STREET
CO10 1ET
Mon-Tues 10 15 am-5 30 pm Thurs
Fri-Sat 9 15 am-5 30 pm Closed
Wednesday

NEWCASTLE UPON TYNE
Tel (0632) 22016
THE MODEL SHOP
18 BLENHEIM STREET
Mon-Fri 9 am-5 30 pm
Sat 9 am-6 pm

WILTSHIRE

MELKSHAM Tel (0225) 703311
MELKSHAM MODEL S
19 BATH ROAD
LTD
MELKSHAM
Open Mon-Sat 9 am-5 30 pm
Wednesday 9 am-1 pm
Free car park opposite

NORTHALLERTON
Tel (0609) 3334
T & F M GROVER LTD
216 217 HIGH STREET
Open 6 days a week
8 30 am-5 30 pm

SURREY

ADDLESTONE Tel (0932) 45440
ADDLESTONE MODELS LTD
63 STATION ROAD
Open 9 am-6 pm
Closed all day Wednesday
Late night Friday 6 30 pm

CARDIFF Tel (0222) 29065
BUD MORGAN
22 CASTLE ARCADE
SOUTH GLAMORGAN
CF1 2BW
9 am-5 30 pm
Early closing Wed 9 am-1 pm

SWINDON Tel (0793) 26878
SWINDON MODEL CENTRE
2 CIVIC CENTRE
THEATRE SQUARE
(Next to Wyvern Theatre)
Open daily 9 am-5 30 pm
Open all day Wednesday

OTLEY Tel (0943) 466535
MODEL SHOP (H & S CLIFF)
FLYING MODELS
57 GAY LANE
Mon-Sat 6 am-6 pm

WALES

NEW MALDEN Tel (01 942)
MICK CHARLES MODELS 0012
33 COOMBE ROAD
Mon, Tues, Thur, Sat 9 30-5 30
Fri 9 30-8 00
Closed all day Wednesday

CARDIFF Tel (0222) 31367
R & W RADIO MODELS
34 LLANDAFF ROAD
Open 9 am-12 30 pm, 1 30 pm
5 30 pm, Monday 8 pm Closed Wed

KIDDERMINSTER Tel (0562)
P & R MODELS 2179
103 COVENTRY STREET
Open Mon, Tues, Thurs, Fri
9 45 am-5 30 pm
Sat 9 am-6 pm
Closed all day Wednesday

YORK Tel (0904) 34281
YORK MODEL CENTRE
17 DAVYGATE CENTRE
DAVYGATE
Open Mon-Sat 9 am-6 pm
No half day

YORKSHIRE

WOKING Tel (048 62) 66493
WOKING MODELS
9 GOLDSWORTH ROAD
Open 9 am-5 30 pm Mon-Sat
Closed Wednesday afternoon

NEWPORT Tel (0633) 65061
MAKE A MODEL
123 COMMERCIAL STREET
Mon to Sat 9 am-5 30 pm
Late Friday 8 pm

BARNSELY Tel (0226) 43561
DON VALLEY SPORTS
28 NEW STREET
Open 9 am-5 30 pm Mon-Sat
Closed Thursday

WORCESTER PARK Tel (01 330)
MODELLER MARKET 2964
THE VINTAGE ENGINE SHOP
243 CHEAM COMMON ROAD
Open 6 days a week 8 30-5 30
Thursday 8 30-7 30

SWANSEA Tel (0792) 52877
SWANSEA MODELS &
HOBBIES LTD
PLYMOUTH STREET
SA1 3QQ
Open Mon-Sat
Late night Fri 6 pm

BRADFORD 8 Tel (0274) 26186
MODELDROME
182 MANNINGHAM LANE
9 30 am-5 45 pm
Closed Wednesday

You can buy with
confidence from
the shops in this
Shop Guide

* Shops offering a mail order
service are denoted by an
asterisk.

CLASSIFIED advertisements

All classified Advertisements must be pre-paid.
Private and trade rate per 15p per word (min. £2.40). Box Numbers £1.00 extra. Semi display classified £3.50 per single column centimetre (min. £8.75, max. £17.50). All advertisements are inserted in the first available issue. Box replies to be sent care of Advertisement Department, PO Box 35, Hemel Hempstead, Herts. HP1 1EE. There are no reimbursements for cancellations.

FOR SALE

FAIT/R — absolutely brand new unrun Nelson AAC — £125. R Haughton, 35A Pavilions Way, Brackley, Northants. Y

Elfin 2.49 diesel Also DC 3.5cc diesel. Both good running order. Offers Tel. Disley 3813. Y

Rare continental ignition diesel and glow engines for sale. G Everwyn, Dachsteinstr 12a 8000 Munchen 82, Germany. Tel. Munich 424470. VVVXY

SERVICES

Stuck for that part? Small batch and one off machine work. Trade enquiries welcome. Send sketch for quote. Newbound Engineering, 39 Woodlands Way, Ashted, Surrey. Tel. Ashted 74648. Y-D

Try hang gliding. Learn how to fly safely and quickly — real fun and excitement — South Wales school — Tel. 0443169078. YZ

GENERAL

Engine collector pays cash for engines produced until 1970. Write to Dieter Sorge, PF50, D 3220 Alfeld, W Germany. U-A

Is there an experienced team race flyer in the Oxford area interested in forming a partnership for competitions. Tel. Stedhampton 890891. Y

Engine repair service, repro parts, rebore etc., send engine or details (SAE) for quote. P. Mason, 186 Hatton Road, Bedford, Middlesex. WXY

Come fly your plane in the Lake District at Ambleside with others of such interest. B. B. from £6. Evening meal and packed lunch available. Details SAE Linda Marshall, Shirland, Comston Road, Ambleside, Cumbria (Tel. 09663 2809). Y

GLIDING HOLIDAYS

Professional instruction in modern dual controlled two seaters. Full board, all launching and flying for one or two weeks at Britain's most famous and best equipped club, an hour from London at Whipsnade Country — the beautiful Dunstable Downs. Experience unnecessary. Send for brochure giving prices. From the London Gliding Club, Dunstable Downs, Bedfordshire. Tel. (0582) 63419. Code AR3

AIRSPORTS

MICROLIGHT AVIATION CENTRE

No-nonsense tuition, Micro-lights bought and sold. Flying holidays arranged, laminated props made to your specifications.

Phone for details of courses

AIRSPORTS
Cwm Rheidol, Aberystwyth SY23 3NA.
Phone 097-086-397

IRELAND

Skyleader R/C System

Large selection of kits by MK, Veron, M.F.A., Kamco, Ripmax, True-Line, Keil Kraft, etc.

O.S. ENGINES

Accessories by Kavan, M.F.A., Micro-Mold, SLEC, Ripmax, PB, Goldberg, Taylor, MK, TopFlite.

SOLARFILM — EPOXY — DOPES

See the selection at:

W. J. OWENS
41 Main Street, Bray
(Phone: Dublin 863664)

BOOKS AND PUBLICATIONS

Out of print book service, 17 Fairwater Grove East, Cardiff. No fees. Send S.A.E. for details. T.C.

'Sailplane and Gliding' — the only authoritative British magazine devoted solely to the sport of gliding and soaring, 52 pages of fascinating material and pictures. Published every other month. Send £7.15 (or £17.00) for a year's subscription to British Gliding Association, Kimberley House, Vaughan Way, Leicester, England. T.C.

Aeromodellers back issues mart. Vast stocks of back issues held in stock. Beaumont, 656 Holloway Road, London N19 3PD.

WANTED

Cash paid or part exchange for vintage and new engines worldwide. 646 High Road, North Finchley, N12 0NL. Tel: 01445 6531. T/C

Wanted — Ready built model aircraft, boats, yachts, cars, steam driven models, also engines, kits, radio control equipment etc. If you are selling up Tel. Godalming 21425. T/C

Wanted. Oliver Tiger birthday present for novice control-line freak. Tel. 060-483 1405. Y

The Cornish Gliding and Flying Club
Trevellas Airfield, Perranporth, Cornwall
Tel: Perranporth 2124

Gliding courses in modern fleet from May — B.G.A. fully-qualified instructors — fine soaring — lovely coastal airfield — ideal for a different family holiday. Details with pleasure from:

The Course Secretary, Tremearne,
Braage, Helston, Cornwall
Tel: Helston 62284

Try flying one from the inside!

Come gliding near Loch Leven! Britain's premier soaring site (the UK altitude record, 36190ft., was set at this club last year) offers beginners' holiday courses from £75 a week.

Course brochures from **Scottish Gliding Union, Portmoak Airfield, Scotlandwell, Nr. Kinross. Or ring (059 284) 543.**

MEGOW'S REPRODUCTION PEANUT FOKKER PLAN PACK — £1.00

KIT £1.50 — P&P 50p

GEMINI PRODUCTS

8 GREYSTONE GRANGE CRESCENT,
SHEFFIELD U.K.

TRY GLIDING

Modellers make super soaring pilots. Spend your holidays learning to glide on a course at Britain's largest Gliding Centre. Details from:

LASHAM GLIDING CENTRE
Alton, Hants. GU34 5SS
Phone: 025-683-322

BALLARD'S RTP

54 Grosvenor Road, Tunbridge Wells,
Kent TN1 2AS — Phone 0892 31803

Electric RTP Kits, Motors and Accessories.
Mail Order Catalogue and Guide 70p (no stamps). Enquiries S.A.E.

AMERICAN AERO-MODELLING MAGS

R/C Modeler	£2.25
M.A.N.	£1.65
Flying Models	£1.15
Scale Modeler	£2.00

Current — and some back issues available

THE AVIATION BOOKSHOP
656 Holloway Rd, London N19 3PD

JIMMY SAVILE OBE — STOKE MANDEVILLE HOSPITAL APPEAL

AVIATION TIES, HEADSQUARES, TEESHIRTS FOR SALE. Send 40p for PRICE LISTS payable to WHITTLE AVIATION LTD.

WHITTLE AVIATION LTD.

P.O. 79 Nottingham NG2 7RS
Tel: 0602 410795 Telex: 377494 MKLEIN G

WHY NOT TRY A GLIDING HOLIDAY THIS YEAR?

Accommodation in a Club House and instruction by professionals at our lovely site in the Cotswolds. Bring your camera and record the holiday of a lifetime. Write to:

The Holiday Manager, Bristol and Glos. Gliding Club, Nympsfield, Stonehouse, Glos. GL10 3TX
Telephone: Dursley (0453) 860342

JAMAR ENGINEERING & DESIGN LTD.

We stock a varied range of engines and accessories including tanks, clunk tanks, silencers, glo plugs, engine mounts, props, spinners, Control line wire, elevator horns, hinges, wheels and Radio Control units.

We also offer a full engine repair service. Inspection FREE. Fully illustrated and informative engine and accessories catalogue available 50p.

JAMAR ENGINEERING & DESIGN LTD.

P.O. Box 91, Meld, Clwyd CH7 1YX

Take a holiday gliding course with the YORKSHIRE GLIDING CLUB

Fullly 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.

For brochure write to: **The Secretary, Yorkshire Gliding Club, Sutton Bank, Thirsk, Yorks.** Tel: Thirsk (0845) 597237

UNIMAT LATHES

THE NEW 'COMPACT 5'
LIST PRICE £400.20 OUR PRICE £345.00
THE UNIMAT 3
LIST PRICE £189.75 OUR PRICE £166.50
REDUCTIONS ON ALL ACCESSORIES
Prices include V.A.T. Delivery is FREE. Also reductions on COWELLS, MYFORD, ETC. S.A.E.
ALL MODELS ENGINEERING LTD.
91 Manor Way, Ruislip, Middlesex HA4 8HW
Telephone: Ruislip 74126

world

FREE FLIGHT

review

This great book by Bill Hartill is acclaimed around the world. Capturing the spirit and challenge of Free Flight, this pictorial and written review of world Free Flight activity is lavishly illustrated with 674 photos, 52 in full colour with 109 Free Flight designs. An elegant 416 page volume printed on heavy coated stock, 8 1/2 x 11 inches and with sturdy sewn-in hard cover binding. Send \$30 plus postage (\$16 air or \$2 00 sea).
Free brochure available.

WORLD FREE FLIGHT PRESS
7513 Sausalito Ave., Canoga Park,
Calif. 91307 U.S.A.

tmd

the modellers' den

SMALL SCALE SERVICE

We continue to supply all your Small Scale items, including Peck Polymer Kits and Accessories, Flyline Kits, R.N. Kits and many other useful things such as Rubber, Basswood, Jap Tissue, Bamboo Strips, etc. Send £1.00 for fully illustrated lists, partly refundable (50p) with first order.

The Modellers Den — Dept. AM1,
2 Lower Borough Walls, Bath.
Phone: 0225-60116, Avon BA1 1QR.

**Indoor and Peanut Modellers
Micro-X and Bob Peck Products**

Inc. indoor balsa, brown Co2, Hungerford wheels, washers, bearings, Pirelli, hank or stripped. **New!** Ambroid balsa glue. **New!** First quality carbon fibre tows. **Now available from:**

SAMS

12 Hatfield Road, St. Albans, Herts.
Tel: St. Albans 53954
Send S.A.E. for Mail Order lists
BARCLAYCARD — welcome — ACCESS

Now you've built a model

Why not build a full size aeroplane? Join the Popular Amateur Aircraft Industry with the **Popular Flying Association** and learn how to build your own flying machine. Send 75p for information pack. **Popular Flying Association, Terminal Building, Shoreham Airport, Shoreham by Sea, Sussex, England. Telephone: Shoreham by Sea 61616**



Bind it

It's so easy and tidy with the Easibind binder to file your copies away. Each binder is designed to hold approximately 12 issues and is attractively bound and blocked with the Aeromodeller logo.

Aero modeller

Price U.K. £4.00 including postage, packing and V.A.T., overseas orders £4.40. Why not place your order now and send the completed coupon below with remittance to Easibind Ltd., 4 Uxbridge St., London, W8 7SZ.

it's easy with EASIBIND

Nat. Giro No. 5157552
Please allow 3/4 weeks for fulfilment of order

Order Form Aeromodeller

To: Easibind Ltd., 4 Uxbridge St., London W8 7SZ

I enclose p.o./cheque value for
..... binders

Years required

(BLOCK LETTERS PLEASE)

Name

Address

Date

Registration No. 307469



DID YOU KNOW? THE WYCOMBE DELTA IS GUARANTEED TO FLY IN ALMOST NO WIND.

66" SPAN — RIPSTOP NYLON SAIL — FIBREGLASS WING SPARS. ASSEMBLED IN SECONDS — EASY TO FLY **£8.28**
ALSO 46" SPAN FRINGED DELTA **£5.95**

SIMILAR CONSTRUCTION AND OUTSTANDING LIGHT WIND PERFORMANCE. AVAILABLE THROUGH YOUR LOCAL MODEL SHOP — AGENTS ENQUIRIES INVITED

2 MOLE RUN,
DOWNLEY,
HIGH WYCOMBE,
BUCKS O494 35388

THE WYCOMBE KITE CO — MANUFACTURERS OF HIGH PERFORMANCE KITES

FORMBY MODEL & HOBBY SCENE

THE BIG NAME IN THE MODEL WORLD

MAIN STOCKISTS OF GULLOWS KITS

SERIES 900 **£1.95**

TROJAN, BIRD DOG, MUSTANG, CHIPMUNK, SKYRAIDER TYPHOON

SERIES 600 **£2.10**

CESSNA 180, PIPER S/CUB, JAVELIN, LANCER

SERIES 500 **£2.45**

WARHAWK, Fw190, HELLCAT, SPITFIRE, Mess 109, HURRICANE, RUFFE, STUKA, AVENGER

SERIES 300 **£3.65**

AERONKA, CESSNA 170, ARROW, PIPER S/CUB, PIPER CHEROKEE, BEECHCRAFT MUSKATEER, FAIRCHILD 24, CESSNA 150

SERIES 200 **£5.95**

THOMAS MORE SCOUT, SESA, NIEUPORT II, FOKKER TRIPLANE, DE-HAVILLAND 4, RUMPLER C5

SERIES 400 **£7.70**

Mess 109, MUSTANG, MITSUBISHI ZERO, WARHAWK, Fw190, SPITFIRE

SERIES 800 **£10.50**

SOPWITH CAMEL, MITCHELL, CESSNA SKYHAWK, PT17, MOSQUITO MkIV

Mail order a pleasure. Same day despatch. P&P50p. Free on orders over £10 (U.K. only).

77/79 GORES LANE, FORMBY, MERSEYSIDE. Telephone: (07048) 70432

Now Open!
**in GRAVESEND
BRITANNIA models!**

10 HARMER STREET, GRAVESEND, KENT

Telephone: Gravesend (0474) 50292

2 minutes from Tilbury Ferry

PHONE IN ACCESS AND BARCLAYCARD ORDERS
Closed Monday - late night Tuesday 8.00 p.m.



SAL TAIBI'S 1938 VINTAGE

POWERHOUSE

A PLEASURE TO BUILD — A JOY TO FLY

- OLD-TIME & S.A.M. CONTESTS
- RADIO CONTROL SINGLE • TWO OR THREE CHANNEL
- .40cu.in. TO .60cu.in. MOTORS
- KIT CONTAINS:

pre-cut parts and wing ribs, selected balsa wood, radio control hardware pack, nylon covering, wire, full-size rolled plans, building instructions.

Golden Era Kits

MODELS AND HOBBIES • 3 BELL STREET • MANDER CENTRE • WOLVERHAMPTON • ENGLAND

TEL: WOLVERHAMPTON 26709

Also available from:
S. H. GRAINGER & CO.

108 Caldmore Road,
WALSALL, Staffs.
Tel: 0922-23382

PRICE **£37.95**
POST AND PACKING
£2.00



Wing Span 84in. (2135mm)

KITTED BY PERMISSION OF SAL TAIBI

OTHER ITEMS NEEDED FOR COMPLETION



MICHAEL'S MODELS

Leading Control Line Specialists

646-648 HIGH ROAD, N. FINCHLEY,
LONDON, N12 0NL Phone: 01-445 6531

Open 6 Days a Week

9.00-6.00

STILL IN STOCK

Super Tigre G20/15 Glows
£23.37

NEW ENGINES

ED Racer 2 4cc	£14.95
ED Racer 2 4cc R.C.	£16.10
ED Super Racer 2 46cc	£17.12
ED Super Racer 2 4cc R.C.	£18.17
The E.D. Super Fury is still available in marine form with air-cooled conversion sets included at no extra charge	
Standard 1 46	£15.38
1 46 R.C.	£15.50
Super Tigre X21 STD	£46.62
Super Tigre X29 Speed	£47.48
OPS 29 Speed ABC	£58.04
PAW 80	£11.50
PAW 1 49 DS	£12.08
PAW Contest Schnuerle Port 1 49 Deisel	£14.95
PAW 2 49 DS	£13.23
PAW 2 49 DS Tuned	£15.47
PAW 19 DS	£14.38
PAW 19 DS Tuned	£16.20
Paw 2 49 DS R.C. and Silencer	£20.70
PAW 19 DS R.C. and Silencer	£21.85
ZOM MkII 2 49 Diesel, Spanish	£20.18
LLAM 2 5cc Diesel, Spanish A1	£16.50
LLAM 2 5cc Glow, Spanish A3	£16.00
LLAM 3 5cc Glow A4	£17.00
LLAM 2 5cc Plain Bearing Diesel A5	£15.00
LLAM 2 5cc Plain Bearing Glow A6	£11.60
Parés F1 2 5cc Diesel	£43.00
Parés R1 2 5cc Diesel	£49.95
Fox 35 Stunt	£17.19
Cox 049 Babe Bee	£7.95
Cox 049 Black Widow	£10.50
Cox 049 TD	£17.95
Cox 051 TD	£17.95
Cox 09 TD	£19.95
Cox 020 Pee Wee	£9.75
Telco CO. Kit	£9.84
Telco Turbo Tank 3000	£12.95
Modela CO. Engine	£13.75
Hummingbird 03 Glow	£10.60
Seagull 061 R.C. Glow	£14.85
G-mark Seagull 061cc Stunt Glow	£13.25
OS15	£16.35
OS20	£18.45
OS25	£19.35
OS 35 Stunt	£21.35
Merco 35 Stunt	£19.11
DC Dart	£11.25
DC Merlin	£10.60
DC Spitfire	£11.62
DC Sabre	£11.82
ME Heron	£13.57
ME Snipe	£15.05

FOR COLLECTORS AND SPORT FLIERS

G-Mark 5-Cylinder Radial	£99.95
G-Mark Twin	£39.95
Mills 75 Diesel	£12.33
Mills 1 3 Diesel	£12.51
K 150 1 5cc Diesel	£8.95
K 200 2cc Diesel	£9.50
K 250 2 5cc Diesel	£10.95
K 350 3 5 Diesel	£11.95
OTM 1 5 Diesel	£11.60
Mk 17 1 5 Diesel	£11.95
Raduga 7cc Glow	£17.95

STUNT

Aero Star (Foam Wings)	£16.99
Mercury Crusader Kit 29-35	£23.95
Sullivan Lead Out Kits (Small A-B) or (C-D Large) Size	60p
4 1/2" x 2" x 1" Stunt Tank	£1.17
Roberts Three Line Handle	£7.13
Bellcrank, upright	£3.57
"Magnum" C.L. Handle Adjustable	£2.66
1oz Glass Cloth	sq yd £2.25
6oz Glass Cloth 60" x 20"	£2.25

SULLIVAN READY-MADE LINES

0.012" x 52"	£2.48
0.015" x 52"	£2.52
0.015" x 60"	£2.64
0.015" x 70"	£2.84
0.018" x 52"	£2.50
0.018" x 70"	£2.92
0.021" x 70"	£3.12

ENGINE NEWS

NEW! We have just received supplies of the NEW D.C. BEE £10.35

This is an attractive 0.8cc glow engine based on the well established Wasp, but equipped with radial mount fuel tank with identical mounting dimensions to the Cox Babe-Bee 049. The cylinder head is anodised yellow and the cylinder itself finished in black. For beam mounting the Wasp remains in production and can be thoroughly recommended.

D.C. WASP £8.20

For those of you who would like to pretend that you have an early D.C. Dart, we have in stock a supply of Dart Heads anodised green at £1.15 each!

NEW!! INSERTS FOR ROSSI 15

FAI or Nitro, with separate plug	£2.40
Inserts only, with gasket (FAI)	£1.20
1 1/2v Plugs x 1/4"	£1.20

SPEED AND TEAM RACE

Multi-Function Tank Valve (Metkemeyer Type)	£16.95
Tank Valves STD	£6.55
Tank Valves Nelson	£6.55
Finger Valves	£4.20
A Circular Bellcrank with Housing	£4.20
Team Racing Wheel Bushed	£2.56
Comp Screws (Allen Heads)	85p
Glo-Bee Cox 049 051 Racing Head	£4.20
Inserts for High Nitro Fuels	each £1.64
Mono Line Handles	£34.61
Standard Type with safety strap	£34.61
Fox Connectors	4 per pack 42p
Small, Medium, Large	£19.95
SMAE Safety Prop Nuts 5mm - 1/2" UNF - untapped	£1.44

Carbon Fibre for props:
10 TOWS BY 1 METRE A PACK £1.35
U-Reeley handles with 15 lines £12.95
Kustom Kraft 1/4" or Mouse Race Wheels 2pr £1.80

By the time this advertisement appears we should have more stocks of Nelson engines incl. the new 15 Glow! Ring for details.

COMBAT

100ml Syringe	£2.80
Grip Tight Pacifiers Tanks	each 16p
Laystrate 100ft L.W.	a reel £1.03
Super Tigre N.V.A.	£1.32
Super Tigre Needles	42p
Rubber Fuel Tubing 40"	50p
Amp Merco 0.5 for glow plugs	£2.32
Tornado 7 - 4 Props	each 36p
Taipan 7 - 4 Props	each 59p
Pacifier Tank Apts	each 50p
Pacifier Venturis to fit G20 15 Glow	£1.50

TAYLOR PLUGS

1 1/2v Comp. Plug	84p
2v Standard Plug	84p

In both long and short reach

TRIBE BROS PROPS (FIBREGLASS)

1/2" A Team Race	£4.00
FAI Team Race	£5.00
"B" Team Race	£5.00
C/F Metkemeyer (FMV) Nelson	£6.00

FOR FULL RANGE SEE C.L. LIST

REV UP SPEED PROPS WOOD

8-8	£2.23	9-12	£2.23
8-9	£2.23	9-13	£2.23

ZINGER WOOD PROPS

7-6	90p	9-6	98p
8-6	94p	9-7	98p
8-7	94p		

IRVINE Pitch Gauge, direct reading	£29.75
TECHNICRAFT Prop Pitch Analyser	£21.24
Prop Balancer on stand	£1.06

Send 40p in stamps for new comprehensive lists. Refundable with first order.

MAIL ORDER A PLEASURE
EXPORT ORDERS WELCOMED

All inquiries must be accompanied by SAE

Phone Barclaycard, Access No. for same day service



D.D.D. CONVERSIONS

Changes Cox Glows to Diesel	
020 Kit	£6.95
049 051 Kit	£6.95
049 051 Kit with Spring	£8.95
09 Kit	£9.53

SPARE FLUOCARBON DISCS AVAILABLE

Lightweight Jap Tissue	per sheet 14p
Heavyweight Jap Tissue	per sheet 36p
Lightweight Jap Silk	per sq yd £2.61
Heavyweight Jap Silk	per sq yd £2.98
Mercury F.F. Tanks - Small and Large at	39p
MFA F.F. Tanks	Small 56p Large 62p

VINTAGE CORNER

Spark Accessories	
3 volt Lightweight Coil	£9.25
1/4" x 3/2" P.I. KLG Plugs	£2.40
1/4" x 3/8" Plug Adaptors	99p
Condensers	£1.54

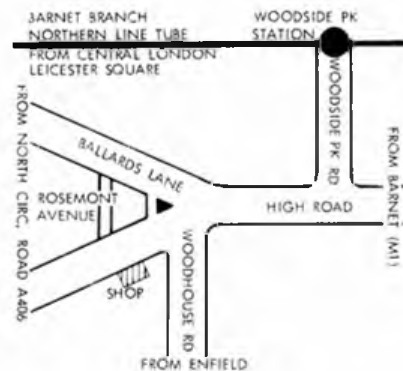
TREXLER AIRWHEELS

All sizes available from 1 1/2" to 4 1/2"

Vintage Engines always in stock for Sale or Swap

Several early Spark engines at present in stock, including Brown Juniors, OS 10cc, OK60 and many more

To reach us from Oxford Street, take No. 13 bus to Tally Ho, Finchley.



Although the prices on this list were current at the time of printing (6-81) we reserve the right to supply at the price current when the goods are despatched.

We buy all types of engines for cash. Send for best quotation by return. Phone for new and secondhand stock position. Payment by Barclaycard, Bank America Card, Access Mastercharge, Eurocard & Vista Credit Cards, plus Negotiable Currencies.

O.S.

Front runners in any company

The O.S. range of model aero glow plug engines is something really special. These are Quality products developed through many years of progressively advancing model engine technology in which O.S. products have consistently been leaders. Sheer excellence of design is backed by the very best in engineering standards and manufacturing technique. Quality, reliability and performance are all part of the deal when you buy an O.S. motor.

£21.35

with
muffler

O.S.
MAX-35



£16.35

with
muffler

O.S.
MAX-15



£14.35

with
muffler

O.S.
MAX-10



£38.65

with
muffler

O.S. MAX
40FSR-S



O.S. MAX-30

£20.50

with
muffler



£18.45

with
muffler

O.S.
MAX-20



O.S.

**PRODUCTS
LIMITED**

UNIT 2, BRUNSWICK
INDUSTRIAL PARK,
BRUNSWICK WAY,
LONDON N11 1JL

Tel: 01-361-1123/4

O.S.
FS.60

£110.00



*You can
see them
at your
local model shop*