

# AERO

## MODELLER



**FREE FLIGHT NATIONALS  
SUPER 5th REVOLUTION  
COMBAT MODEL PLANS  
FOCKE WULF STOSSER SCALE DRAWINGS**



A COMPLETE RANGE OF  
KITS FROM BRITAIN'S MOST  
PROGRESSIVE MODEL  
MANUFACTURER.

# The Mark of Quality



## PROFILE, SCALE CONTROL LINE

BOTH £8.34



FW.190 28" SPAN

*Two superb near-scale models with aerobatic performance. Construction is straightforward with a box-profile sheet fuselage, built-up wing panels and sheet tail surfaces, moulded cowls and detail parts are added to achieve a most realistic appearance. For realism combined with an excellent performance from a really complete kit these two models cannot be bettered.*



HURRICANE 28" SPAN

FOR 1 to 1.5cc MOTORS

## CONTROL LINE



£8.95

SCOUT 21" SPAN .75 to 1cc

*An attractive sporty full bodied trainer designed specifically for the beginner to control line flying. All the wire parts are pre-formed and designed so that no soldering is necessary. This model is tough and rugged, designed to accept all the rigours of learning to fly yet with the looks and performance to satisfy the budding pilot well beyond the initial stages.*

## FREE FLIGHT



HOB0  
28" SPAN

£4.50

*All balsa glider with high performance undercambered wing. All parts are pre-decorated, and complete the model. An ideal introduction to aeromodelling.*

## FREE FLIGHT GLIDERS



£5.95

PETREL 43" SPAN

*An attractive thermal soarer with superb stability on the towline. Easy to build, conforming to A1 specifications, this model is an ideal introduction to these events.*

MERLIN  
33" SPAN

£4.95

*A simple to build and fly glider with die-cut balsa parts, full size drawing and comprehensive instructions. The performance of this model is quite outstanding and is an excellent introduction to towline techniques.*

## MISTRAL 55" SPAN



£7.95

*High performance towline glider with auto-rudder and tip-up tail dethermaliser. Straightforward assembly. A thoroughbred design with an exceptional performance.*

## 2 FUNCTION RADIO CONTROL

*The "Kestrel" is an economical and very easy to build sailplane, which can be flown with no previous experience. For initial flights it can merely be guided by gentle use of rudder control and with its low sinking speed may be left to land itself.*

**NEW**

KESTREL  
67" SPAN

£16.95

CAN BE FLOWN FREE FLIGHT

Ask your model shop for our range of R/C trainers.  
Slingsby EAGLE 70" span. Slingsby CAPSTAN 72" span.  
INSTRUCTOR 58" span. C.F.I. 58" span.  
DUE FOR RELEASE SOON  
NAVION, 1/6 scale Microlight 60" span.  
Slingsby KADET 72" span.  
DISTRIBUTED IN U.K. BY RIPMAX AND IRVINE ENGINES

MID WALES MODEL  
MANUFACTURERS LTD.  
32 ST. JOHNS HILL  
SHREWSBURY SHROPSHIRE

# AERO

## MODELLER

AUGUST 1983

**Publisher**  
Tony Dowdeswell  
**Graphics**  
Lorna Cullen

**Advertisement Manager**  
Glenn Robertson  
**Advertisement Director**  
M. Gray

**Editorial Director**  
R. G. Moulton  
**Managing Director**  
Gospatric Home



Page 360



Page 372



Page 381

### Cover

As anxious eyes scan the earlier launch downwind, Margaret Douce releases husband Mike's A/2 glider and Toby Owen (foreground) waits patiently for the word 'go' from his father Bill in typical National Championships launch at RAF Barkston Heath. Inset a cluster of happy youngsters, stimulated by the DPR Chuckie competition with instructor Cyril Green on Spring Bank Holiday Monday. Also inset, Neil Gill and his 5th Revolution control line combat design is the full size plan features in this issue.

### Subscriptions

Annual UK subscriptions, £11.40 Overseas £13.00 or \$26.00. Send remittances to Model & Allied Publications Ltd, Subscriptions Department, PO Box 35, Wolsey House, Wolsey Road, Hemel Hempstead HP2 4SS (subscription enquiries Tel 0442 51740). Change of address US Postmaster send address changes to Model & Allied Publications Ltd, PO Box 35, Wolsey House, Wolsey Road, Hemel Hempstead, Herts. HP2 4SS, United Kingdom. USA subscription agent Joseph J Dailedu, 4314 West 238th Street, Torrance CA90505

## Contents Volume 48 Issue No. 571

HANGAR DOORS	News of the Aeromodelling scene	358
FREE FLIGHT NATIONALS	The biggest-ever reported by Dave Hipperson	360
MAN POWERED FLIGHT	Ron Moulton reports on new activity using stored energy assist	366
GETTING STARTED IN CONTROL LINE COMBAT	Part 2 how to feature	369
5th REVOLUTION	Neil Gill's super combat design, your full size plan this issue	372
AIRCRAFT DESCRIBED FOCKE WULF Fw 56 STOSSER	Scale drawings by Ian Stair, described by Charles Cain	381
FROM THE HANDLE	Latest control line contest news	385
SCALE MATTERS	The Indoor Nationals reported by Allan Callaghan	388
VINTAGE REVIVAL	R V Bentley's Cloud Dozer plans re presented	390
VINTAGE CORNER	Alex Imrie's round-up of the Vintage scene	392
DRAWING PLANS FOR SCALE MODELS	Bill Dennis tells how	396
CLASSIFIED ADS	Pick up a bargain	402

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 Ltd, P O Box 35, Wolsey House, Wolsey Road, Hemel Hempstead HP2 4SS England. Tel Hemel Hempstead (0442) 41221. Second class postage paid in the U.S. at New York, NY USA Mailing Agent Eastern News Distributors Inc 111 Eighth Avenue New York, NY 10011 Distribution to North American hobby and craft stores, museums and bookshops by Bill Dean Books, Ltd, 166 41 Powells Cove Blvd, Post Office Box 69, Whitestone, NY 11357, USA Tel 1 212 767 6632 Distribution to news stand sales by Eastern News Distribution Inc, 111 Eighth Avenue, New York, NY 10111 USA Tel 1 212 255 5620.

The Advertisement Manager reserves the right to refuse or suspend advertisements without giving any reason. Every care is taken to avoid mistakes, but the publishers cannot be 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 artwork originated by the publisher's printers whether editorial or advertising, remains the property of the Publisher and may not be reproduced without permission.

Change of address, US Postmaster: Send address changes to Model & Allied Publications Ltd, P O Box 35, Wolsey House, Wolsey Road, Hemel Hempstead, Hertfordshire HP2 4SS, 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 is published on the third Friday of each month prior to date of publication.

© Copyright Model & Allied Publications 1983



**Model & Allied Publications Ltd**

P.O. BOX 35, WOLSEY HOUSE, WOLSEY ROAD, HEMEL HEMPSTEAD, HERTS. HP2 4SS.

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 — NEW VOYAGER



MEMBER OF THE ARGUS BUREAU OF CIRCULATION

Aeromodeller is printed in Great Britain by Leicester Printers Ltd, The Church Gate Press, P O Box 20, 99 Church Gate, Leicester LE1 9FR. Mono origination by Multi-form Photosetting Ltd, Cardiff, for the Proprietors and Publishers, Model & Allied Publications Limited (a member of the Argus Press Group). Trade Sales by Argus Press Sales and Distribution Limited, 12-18 Paul Street, London EC2A 4JS.



## Pace Aerobatic Team

The Pace Spirit, flown by Richard Goode as part of the Pace Aerobatic Team, can be seen at the following venues during the remainder of the display season. The aircraft will also be featured in an article in this magazine within the next two months.



Date	Event	Date	Event
16 July	RNAS Lee-on-Solent Air Day	21 Aug	Halfpenny Green
16 July	RNAS Portland Air Day	27 Aug	Borough of Bolton Display
16 July	RAE Wyton Open Day	28 Aug	South Marston Air Show, Swindon
17 July	RNAS Portland Air Day	28 Aug	Leicester Air Show
17 July	Bournemouth Air Display	29 Aug	Nottingham Air Show, Tollerton
17 July	USAF Fairford Open Day	29 Aug	Oulton Broad Regatta
22 July	RAFA Display, Eastbourne	29 Aug	Erith Carnival, Kent
23 July	International Air Tattoo, Greenham Common	29 Aug	Lions Club Show, St Albans
24 July	International Air Tattoo, Greenham Common	29 Aug	Festival of Transport, Crich
27 July	RNAS Culdrose Air Day, Cornwall	30 Aug	Walsall Show
30 July	Newcastle Corporation Air Display	4 Sep	RAFA Display, Keswick
31 July	Bodmin Air Day, Cornwall	10 Sep	Brighton Speed Trials, Brighton Seafront
4 Aug	Weston Super Mare Air Day	10 Sep	Battle of Britain Day, RAF Abingdon
6 Aug	Duns Carnival, Ayrshire	11 Sep	TT Race, Silverstone
10 Aug	International Air Day, RAF St. Mawgan	11 Sep	Tiger Club Air Show, Redhill
10 Aug	Ilfracombe Lifeboat Show, Devon	17 Sep	Dunkeswell Air Day
13 Aug	RAF Valley Air Day, Anglesey	18 Sep	1000Km Race, Brands Hatch
13 Aug	Festival of Transport, Yeovil	17 Sep	Battle of Britain Day, RAF Finningley
14 Aug	Festival of Transport, Yeovil	23-25 Sep	British National Aerobatic Championships, Venue TBD
14 Aug	Luisgate Festival of Flight, Bristol	9 Oct	Oxford Power Sports Event
14 Aug	Coventry Air Day, Baginton		
21 Aug	Irish International Air Show, Dublin		

*Pace Petroleum – Britain's largest independent petrol supplier. Pace House, East St., Farnham, Surrey. 0252 724554*



**WE DISTRIBUTE WILLIAM BROTHERS QUALITY ACCESSORIES**



### 2" SCALE MACHINE GUN KITS



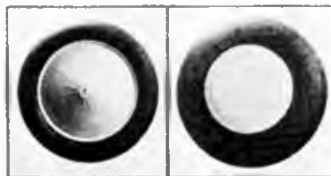
Spandau and Vickers also in 3" scale.

### SCALE PILOTS

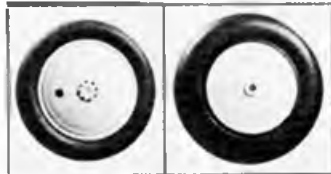


1", 1 1/2", 2", 2 5/8" and 3" scales.

\* Advance orders being taken for Meteorite \*



VINTAGE AIRCRAFT      SMOOTH CONTOUR



GOLDEN AGE      BALLOON

Scale Wheels from 3/4" to 6 5/8" dia.

### AIRCRAFT KITS

1/72 scale	1/32 scale
Martin B.10	Gee Bee R1
Boeing 247	Gee Bee Z
Northrop Gamma	Wedell Williams
Curtiss C.46	Caudron 460
Douglas World Cruiser	Seversky P35

### LE RHONE ROTARY

1 1/2" and 2" scales. Also Wright Whirlwind and Pratt & Whitney Wasp in 1 1/2" scale.

Engine crankcases and cylinders are available separately.



**STOP PRESS!** *We now have in stock all Irvine engines for distribution. Superb British engines at reasonable prices.*

**FLAIR PRODUCTS, HOLDCROFT WORKS, BLUNSDON, SWINDON, WILTS. Tel:(0793)721303**



# WINDBAG

Revolutionary is a much over-used word in the model aircraft world.

Yet what other word could you use to describe this amazingly easy-to-assemble, even more amazingly easy-to-fly, flying machine?

We call it Windbag because of its unique

anhedral wing which consists of a ready made ripstop nylon envelope that fills with air as the Windbag moves forward.

Its only rigid support is a glassfibre leading edge spar.

Cantilevered below this is the "fuselage" pod, housing radio gear and .40-.60 pusher engine.

Building the Windbag is simplicity itself. Flying it, if anything, is even easier. Because the Windbag is totally unstallable.

And unlike all other aircraft you can hold control movements in for as long as you like. As soon as you release, the Windbag will revert to level flight.

Instantly!

There could be no better introduction to radio control.

At the same time, Windbag, with its combination of brilliant climb rate, outstanding manoeuvrability, short take-off and landing will never become boring for the expert.

The Windbag kit is complete in every respect. The only extras you need are engine, pusher prop, tank and radio gear. The combination of large wheels, steerable nose wheel

(all supplied) and high ground clearance, together with Windbag's amazing rate of climb, its slow flying, and its incredible toughness, make it perfect for practicing touch and go circuits.

## EVERY KIT CONTAINS

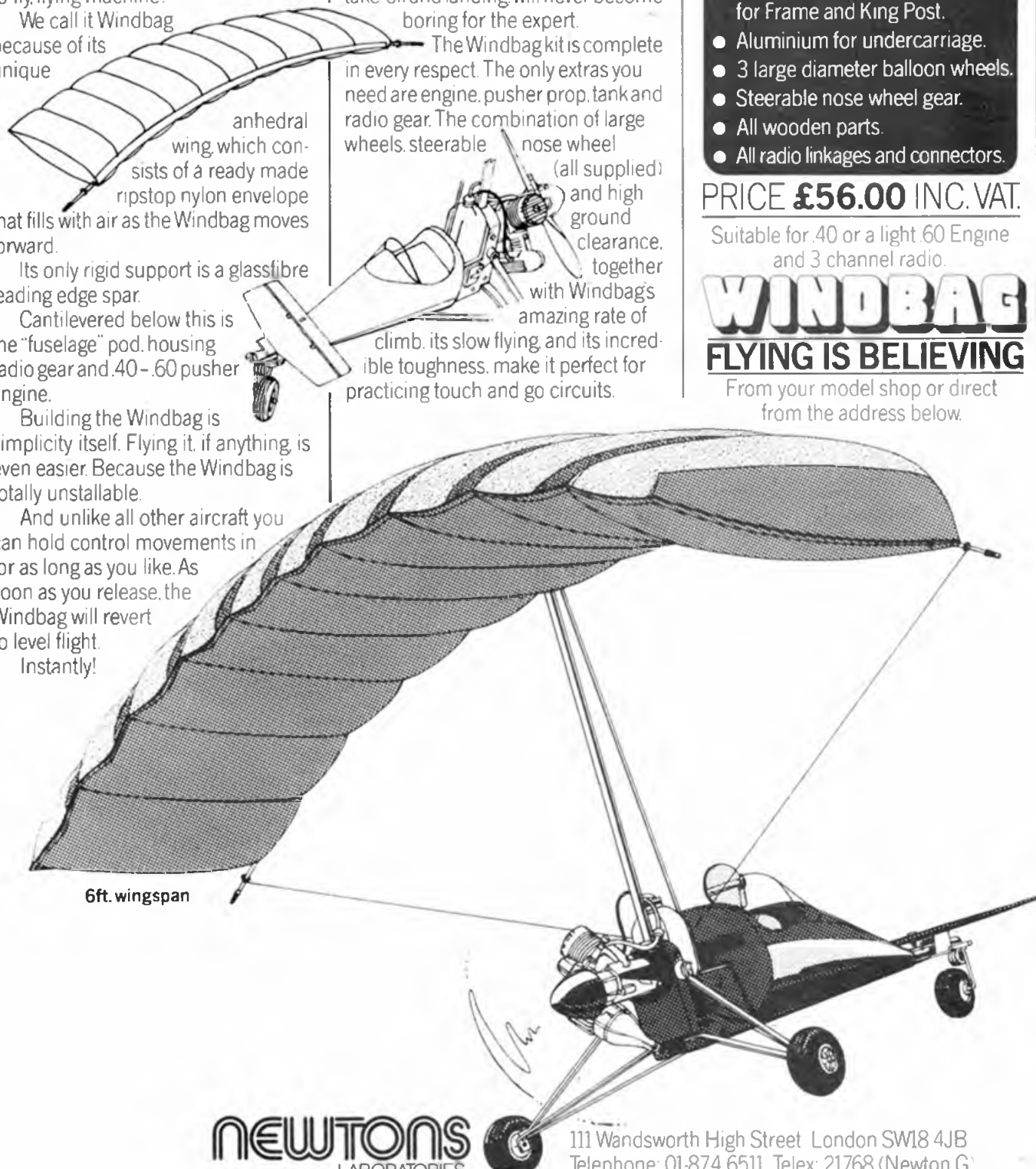
- Ready-made wing—no finishing required.
- Glassfibre spar.
- Lightweight aluminium tubing for Frame and King Post.
- Aluminium for undercarriage.
- 3 large diameter balloon wheels.
- Steerable nose wheel gear.
- All wooden parts.
- All radio linkages and connectors.

PRICE **£56.00** INC. VAT.

Suitable for .40 or a light .60 Engine and 3 channel radio.

**WINDBAG**  
**FLYING IS BELIEVING**

From your model shop or direct from the address below.



6ft. wingspan

**NEWTONS**  
LABORATORIES

111 Wandsworth High Street London SW18 4JB  
Telephone: 01-874 6511 Telex: 21768 (Newton G)

## THE PENCIL



## THE PCL 2000



4 accurate lead diameters ensure consistent lines with no need for sharpening

Ingenious spring action instantly retracts lead under excess pressure to prevent lead breakage.

Ergonomically designed barrel for comfort and ease of handling when drawing.

Controlled lead-advance mechanism gives you exactly the length of lead you need

# It's like comparing a penknife to a scalpel.

The PCL 2000 is more than just a pencil.

It's a technical instrument for engineers, craftsmen & designers.

Its unique, spring-loaded action works like a shock absorber to prevent lead breakage and

ensure you get a consistent line in 4 different widths and a range of lead degrees from 2B to 6H.

The PCL 2000 is available from leading stationers, hobby and model shops.

Contact Customer Service

Department for the name of your nearest stockist.

**Berol PCL 2000**

The precision pencil.

Berol Limited, Oldmedow Road, King's Lynn, Norfolk PE30 4JR. Telephone, King's Lynn (0553) 61221. Telex, 817409. Registered Trade Mark

## INDOOR FLYING

THIS IS A NEW REDESIGNED HELLDIVER, WINGSPAN 508mm. CATALOGUE No. 4578. IT HAS A COMPLETELY NEW PLAN AND INSTRUCTIONS AND CAREFULLY RE-SHAPED DIECUT PARTS. COMES COMPLETE WITH WHEELS, UNDER CARRIAGE, TISSUE, BALSA CEMENT AND DECALS. IN THE RIGHT HANDS IT IS AEROBATIC. AVAILABLE FROM ALL GOOD MODEL SHOPS. PRICE £3.95. RECOMMENDED MOTOR 4551.



THERE ARE NO DIFFICULT NOISY ENGINES TO START NO EXPENSIVE FUEL TO BUY AND ITS QUIET AND POLLUTION FREE. MAIL ORDER CATALOGUE AND GUIDE 70p UK, £1 OVERSEAS INC P&P YOU CAN START FOR AS LITTLE AS £12.50 ALL ENQUIRIES S.A.E. TRADE ENQUIRIES WELCOME

Try Night Flying with the RTP Lighting outfit Cat. No. 4629 95p.

**BALLARD'S R.T.P.**  
(INCORPORATING HARRY BUTTLER MODELS)

54 Grosvenor Road, Tunbridge Wells, Kent. TN1 2AS. Tel: 0892 31803

## THE 1983 RANGE OF P.A.W. ENGINES

2 MONTH'S GUARANTEE

### HIGH PERFORMANCE DIESEL ENGINES

	All inc. 15% VAT
P A W 80	£13.23
P A W 149 DS-2	£14.95
P A W 149 CONTEST-2	£17.25
P A W 249 DS	£14.95
P A W 249 CONTEST	£17.25
P A W 19 DS	£16.68
P A W 29 DS (WITH SILENCER)	£33.35

### SPORT & R/C ENGINES

P A W 149 GLOW	£17.83
P A W 249 GLOW	£17.25
P A W 149 GLOW R/C A/C (WITH SILENCER)	£23.58
P A W 249 GLOW R/C A/C (WITH SILENCER)	£24.15
P A W 80 R/C A/C DIESEL	£19.55
P A W 149 DIESEL R/C A/C (WITH SILENCER)	£21.85
P A W 249 DIESEL R/C A/C (WITH SILENCER)	£23.00
P A W 19 DIESEL R/C A/C (WITH SILENCER)	£24.15
P A W 29 DIESEL R/C A/C (WITH SILENCER)	£35.65

ALL CONTEST AND GLOWS ARE SCHNURLE TYPE PORTED

OBTAINABLE FROM MODELS SHOP - OR WRITE TO

**PROGRESS AERO WORKS**

PARK MILL, HOBSON STREET, MACCLESFIELD SK11 8BE.





### DIESEL ENGINES

<b>Under 1cc</b>	
DC Dart 5cc	£13.30
DC Merlin 75cc	£12.20
Indian Mills 75cc	£12.35
PAW 80 8cc	£13.25
PAW 80 R/C 8cc	£19.55
PFEFFER 6cc	£32.00
<b>Under 2cc</b>	
Z12 1 2cc	£13.60
Z12 Deluxe 1 2cc	£14.74
Z12 R/C 1 2cc	£18.20
Z12 R/C Deluxe 12cc	£19.34
DC Spitfire 1cc	£13.60
DC Sable 1 5cc	£13.99
PAW 1 49cc DS2	£14.95
PAW 1 49cc Contest 2	£17.25
PAW 149 R/C	£21.85
Indian K 1 5cc	£8.95
DC Spitfire R/C	£18.20
DC Sable R/C	£18.75

<b>2cc to 2.5cc</b>	
Indian K2cc	£9.50
PAW 249 DS	£14.95
PAW 2 49 Contest	£17.25
PAW 249 R/C	£22.95
MVVS 2 5cc RV	£39.95
MVVS 2 5cc FI	£39.95
ED Racer 2 5 Std	£15.99
ED Racer 2 5 R/C	£17.30
ED Super Racer Std.	£18.30
ED Super Racer R/C	£19.50
20M Mkl 2.5 BB	£20.18
Pares 2.5 FI	£43.00
Indian K2.5cc	£10.95
D/C Rapier 1957 Replica	£29.95
D/C Rapier 1957 Replica R/C	£34.55
Replica Mills 1.3 Mkl	£42.95

<b>3.2cc and Above</b>	
PAW 19 DS	£16.70
PAW 19 R/C inc Sil.	£24.15
Indian K3 5	£11.95
Replica Taplin Tempest 3.5	£34.95
PAW 29 DS inc Sil	£33.35
PAW 29 DS R/C inc Sil	£35.95
ED Viking 4 9cc R/C A/C	£28.75
ED Super Hunter 3 46 R/C A/C	£32.25

### GLOW ENGINES

<b>Under 1cc</b>	
Cox 020 Pee Wee	£13.35
Cox 049 Black Widow	£16.60

Cox 020 Tee Dee	£26.50
Cox 049 Tec Dee	£27.30
Cox 051 Tee Dee	£27.30
Cox Babe Bee 049	£14.55
Cox Pee Wee 020 R/C	£14.95
G Mark 03 Std	£11.95
G Mark 03 R/C	£14.50
G Mark 061 Std	£13.95
G Mark 061 R/C	£15.95
Enya 049 Std.	£13.95
Enya 049 R/C	£17.95
Enya 06 Std	£14.75
Enya 06 R/C	£18.65
D/C Wasp 049	£9.67
D/C Bee 049 Radial	£12.21

<b>Under 2cc</b>	
Enya 09 Std	£13.95
Cox Tee Dee 09	£31.35
Cox Medallion 09	£16.95
Cox Medallion 09 R/C	£31.35
G Mark 12 R/C Twin	£46.50
OS10 FSR Stunt inc Sil	£17.75
Webra 1 5 Junior R/C	£12.95

<b>2cc to 3.5cc</b>	
LLAM 2 5 A3 Std	£16.00
OS15 Stunt inc Sil	£20.25
OS20 Stunt inc Sil	£22.75
G Mark 15 R/C	£27.95
Cox Medallion 15	£19.25
Cox Medallion 15 R/C	£18.85
Enya 15 Stunt	£15.50
Enya 19 Stunt	£17.95
Enya 19 BB Stunt	£24.95
ST X15 Combat	£29.95
Irvine 20 Stunt inc Sil	£29.95
Irvine 20 Blackhead Stunt inc Sil	£24.95
LLAM A6 Std	£11.50

<b>3.5cc and Above</b>	
OS25 Stunt inc Sil	£23.95
OS30 Stunt inc Sil	£25.50
OS35 Stunt inc Sil	£26.50
OS40 FSR Stunt inc Sil	£47.95
Irvine 25 Stunt inc Sil	£32.95
Irvine 30 Stunt inc Sil	£42.50
Irvine 40 Stunt inc Sil	£45.50
G Mark 30 R/C Scyl Radial	£129.95
G Mark 30 R/C Twin	£78.95
Enya 29 Stunt	£17.50
Enya 29 Stunt BB	£24.35
Enya 35 Stunt	£18.75
Enya 35 Stunt BB	£25.50

S T 60 Stunt inc Sil	£44.75
Raduga 5cc R/C	£19.95
Merco 35 Stunt	£19.10
Merco 29 Stunt	£17.85

### CO<sup>o</sup> ENGINES

Telco Std	£10.95
Telco 3000	£12.95
Telco 6000	£14.95
Modela CO	£13.75

WE ALSO HOLD THE FULL RANGE OF TELCO SPARE PARTS IN STOCK RING FOR DETAILS

### ENGINE GOODIES

Davis Diesel Conversion 049 051	£10.95
Spare Fluorocarbon Discs (per 5)	99p
Fluorocarbon Reed Valves for 049 BB	99p
Nelson N V A	£4.50
Nelson Needles	£2.25
Nelson High Nitro Heads	£7.95
Nelson Low Comp Heads	£7.95
Rossi Needles Old Type (few left)	£2.50
S T N V A G20 15	£1.50
S T N V A G21 46 and X15	£1.50
S T 20 15 Piston Liners	£12.95
Taylor 2-volt Std Plugs L R	97p
Taylor 2 volt R/C Plugs L R	£1.05
Taylor 1 volt Std Plugs L R	£1.11
Taylor 1 volt R/C Plugs L R	£1.11
Deluxe Glow Clips	£3.95
Short Plug Spanners	49p
Long Plug Spanners	68p
Babe Bee 049 Overhaul Kit	£1.68
TD049 N V	£1.15
BB 049 Glow Heads	£2.25
Tee Dee 049 051 Venture + Body	£6.71
Pee Wee 020 V V	£1.06
Pee Wee 020 Glow Heads	£1.95
Forest Rossi 15 Head	£1.50
Forest Rossi 15 Glow Plug Tread	£1.50
S T 20 15 Pacifier Ventures	70p

**SUPERLINE BRASS PLATED STEEL CORD .017 DIA. IDEAL FOR COMBAT.**  
 30 Metres Roll £1.20  
 500 Metres Reel £13.95  
 1000 metres Reel £25.95

Postage:  
 Up to 5cc — 50p  
 Over 5cc — £1.00  
 Others — 10 per cent



# MICHAEL'S MODELS

*Incorporating Racing Sport and Vintage Engines*

OPEN 6 DAYS A WEEK Mon. - Sat.  
 9.00 a.m. to 6.00 p.m.

Leading Control Line & Vintage Specialists

646-648 HIGH ROAD, N. FINCHLEY, LONDON, N12 0N1  
 Phone: 01-445 6531

## SCOTLAND

EAST & WEST  
 FOR YOUR ESSENTIAL  
 AEROMODELLING SUPPLIES  
 YOUR FIRST REQUIREMENT  
 VISIT

### DUNN'S MODELS

3 WEST NILE STREET  
 GLASGOW G1 2PR  
 Tel: 041-221 0484

29 SCOTT STREET  
 PERTH PH1 5EH  
 Tel: 0738 24540



### DIESEL and GLOPLUG AERO ENGINES

G Mark 5	£87.00
DC Sibre	£10.28
OS40 FS	£68.00
Irvine 20 R/C	£30.50
OS60 FS	£105.00
Fix 15	£13.37
PAW 1 49 DS	£11.00
PAW 19 DS	£13.00
PAW 2 49	£12.00
MB 61 R/C PDP	£77.34
OS15 R/C	£20.30
Fix 25 R/C	£22.45
Fix 36 C Seminal	£32.13
A Webra 61 R/C	£54.61

Many more Aero and Marine New Zealand orders welcome Send 50p P.O. for lists Duty free Export only Duty & VAT liable UK customers

THE MODEL SHOP (Guernsey)  
 No 1 Commercial Arcade, Guernsey CI

# THE BALSACABIN

*The INDEPENDENT Balsa Specialists. We cut the best with you in mind.*

In the coming year it will be the 'CABINS' continuing policy of bringing Top Quality materials to you at the lowest possible prices. These include Birch Plywood (now available in 3" 4" x 36") Birch Dowel, Sitka Spruce, Beech E/Bearers, and of course the very best Balsa, including 'C' Grain, and Contest Grades. Our aim is PERSONAL SERVICE to each and everyone of you, so your patience please, should there be a short delay.

Sheet x 36	Per 5	Sheet x 36	Per 5
1/32" x 3"	99p	1/4" x 3"	£2.16
1/16" x 3"	£1.08	3/8" x 3"	£2.85
3/32" x 3"	£1.29	1/2" x 3"	£3.59
7/8" x 3"	£1.47	1/2" x 4"	£1.68
3/16" x 3"	£1.86	7/16" x 4"	£1.73

Sheet x 36	Per 5
3/32" x 4"	£1.87
1/16" x 4"	£2.16
7/16" x 4"	£2.53
1/4" x 4"	£3.30
3/8" x 4"	£4.45
7/16" x 4"	£5.59

All sizes of strip — leading edge and trailing edge, etc. available. S.A.E. for complete list. P&P on 36" wood £1.75.

DISTRIBUTORS FOR MODELSPAN TISSUE  
TRADE ENQUIRIES WELCOME

**MAP** *We are NOW!* MODEL & ALLIED PUBLICATIONS PLANS AGENTS.

ARE YOU BUILDING FROM AERO MODELLER'S FREE PLANS? THEN ORDER YOUR WOOD FROM THE BALSACABIN.

THE STREET, LITTLE TOTHAM, MALDON, ESSEX CM9 8JQ.  
Telephone: Maldon (0621) 891971 (anytime)

# LONGER LIFE



# BRIGHTER GLOW

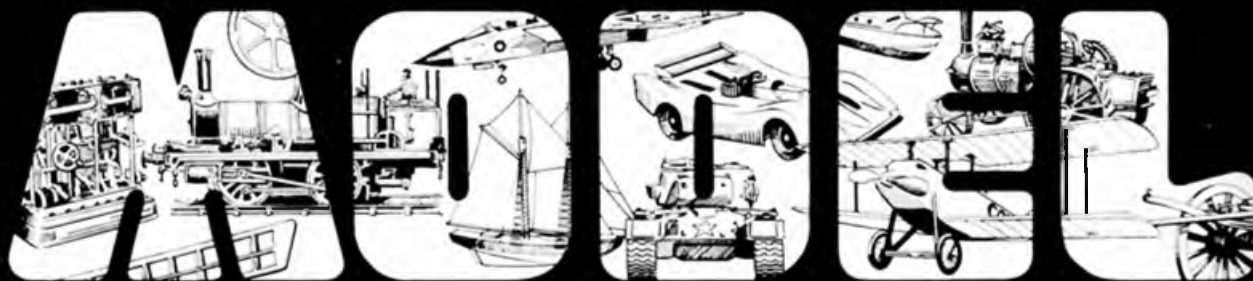
# JOY LUMINOUS PAINT



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

Obtainable from all good Stores, Ironmongers, Paint and Do-it-yourself Shops.

JOY is a registered trade mark.



# 53rd MODEL ENGINEER EXHIBITION

## YOUR EXHIBITION DESERVES YOUR MODEL

Give your autumn building programme a special target this year!

Every aeromodeller takes a special pride in his latest model project. The latest just has to be the best, the most detailed, the most advanced you've ever attempted. So why not set yourself a very special target by entering your latest model project in the 1984 Model Engineer Exhibition? Whatever your special interest, there is a model aircraft class to cover it, and win or lose, it puts you into that very special "Club" of M.E. Exhibition competitors — that's Special indeed!

For further details telephone or write to Elaine Rushton, Exhibitions Dept., Model & Allied Publications Ltd., Wolsey House, Wolsey Rd. Hemel Hempstead, Herts. HP24SS. Tel. 0442-41221

# ENTER THE 1984 COMPETITION—NOW!

Make a date in your diary - 31st December 1983 to 8th January 1984



# WOULDN'T YOU RATHER BE DREMELLING?

Whatever your modelling or hobby project there's a Dremel tool to bring your skills to life. When you're using Dremel - the finest range of mains voltage power tools - there's no limit to the jobs you can do - no limit to your imagination and creativity.

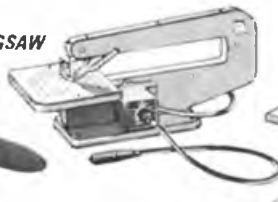
## WITH A DREMEL POWER TOOL



**D2569  
CONSTANT SPEED  
MOTO-TOOL KIT  
£58.00**  
**D359  
VARIABLE SPEED KIT  
£75.70**

The Dremel Moto-Tool Kit. Almost a complete workshop in itself - complete with 35 accessories for cutting, carving, polishing, grinding, filing, de-burring and engraving. Router attachment and drill stand also available.

576 JIGSAW



738 DISC/BELT SANDER



580 TABLE SAW



2214 D-VISE



292 ENGRAVER



MAKE IT WITH **MICROFLAME**

Ring or write for further information and name of local stockist.

Sole U.K. Distributors  
Microflame (UK) Ltd.  
Vincas Road, Diss, Norfolk, IP22 3HQ.  
Tel: (0378) 4813/4/5 Telex: 97492 G



● Mail Order Specialists Since 1946 ●

# 308

**HENRY J. NICHOLLS & SON LTD**  
308 HOLLOWAY ROAD  
LONDON N.7  
Tel: 6072961 or 4272

**IRVINE ENGINES**



All prices include VAT  
20 Stout £27.95, 25 Stout £29.95,  
30 Stout £29.95, 40 Stout £42.95  
R/C engines always in stock

**12 VOLT STARTER**  
Twister 0 £21.95, or with Power  
Panel £35.00

**SPECIAL OFFER**



**12 VOLT POWER PANEL**

**SPECIAL OFFER**



**DUBRO FUEL PUMP**  
The best hand pump available. State for Glo or Petrol. £8.95.

**SPECIAL OFFER**



**DREMEL DE LUXE JIG SAW WITH FLEXIDRIVE**  
RRP £103.00 Our Price £75.00

**'VINTAGE' KITS & ACCESSORIES**  
Bee Buckle June 60 £30.50, Business Set £30.50, Play Set £30.50, Super Torque Precision £28.95, Others, See 81, £37.95, Simplex 60 £28.75, Sticker 50 £18.95, Sug  
Twister C1 25's £21.95, 45B 07 Timers £5.95.

**MOTORS**  
Cox TD, 049 £24.95, Taurus Silence for  
above £6.95, Turbo Cox, Std £9.95, Turbo  
3000 £11.95, Turbo 6000 £13.95, Park,  
DC, etc. etc.

**HEAT GUN**  
for all heat shrink coverings  
£11.95



**SPECIAL OFFER**

**GLOWPLUGS**  
308 Plug Std or R/C  
75p, Taylor LR Std or  
R/C 99p, Enya No. 1  
£1.50, DS Plug all types  
£1.75, 2 with washer for  
Bib, £5.95, 10-pair for  
Bib £7.95



**DREMEL Motor Tool**

**SPECIAL OFFER**



Complete with all accessories.  
RRP £58.00 Offer Price £45.00.

MOST ORDERS DESPATCHED IN 24 HOURS. PHONE ORDERS USE ACCESS. BARCLAYCARD, AMEX. OLD CUSTOMERS WE SHOULD HAVE YOUR DETAILS ON FILE SO CHECK FIRST FOR EASIER ORDERING. \$& ON SMALL ORDERS 7.5p. KITS AND HEAVY ITEMS £2.50. PAIDICS AND ENGINES POST FREE. ALL ITEMS ARE SUBJECT TO AVAILABILITY.

Right: the Pace Aerobatic Team will be livening up more than 100 airshows this year, flying their Pace Spirit (near right) and Ultimate Pitts S-1S (far right). Below, centre: the Newton Laboratories Windbag R/C model has caused quite a sensation at the model trade shows this year - amazingly easy to fly. Bottom centre: Maurice Knight, recipient of MBE in the recent Royal Birthdays Honours List.



### A turning o' the tide?

Our reporter's provocative intro to the Free Flight Nats report on p 360 sets the Spring Bank Holiday event on a pedestal with the bold claim of being 'largest' in the world. He's right in terms of model entry count, though organisational feathers will ruffle elsewhere in defence of infinitely 'larger' spectator attendance, entertainment value and revenue bearing events. He's also undoubtedly right in proving the point that Free Flight has more than survived its splintering off into independence from R/C and C/L. But from our seat on the sidelines, the really impressive factor in what is very much a participant activity is that Barkston drew so many *actual fliers*. From the moment of welcome at the gate, the visitor absorbed a feeling of being involved in the true aeromodelling atmosphere. Immediate contribution to programme sales and team support raffles helped, then a drive past the huge camp site onto a mile long car park around the upwind peritrack convinced anyone that this was quite a comeback. From the kids in the DPR chuckle event, to the vintage and sports fliers and the serious stuff of thermal seeking, it was really something to experience. Of course the strange blessing of fair weather which isolated Barkston from the rest of the nation's cold and wet airstreams played its part; but then maybe this was more than fate and the tide is really turning for free flight?

### Flying a kite with a very big difference

One of the most fascinating flying models introduced for some time must surely be the Newton Laboratories *Windbag*, which has created something of a sensation at the big model trade shows this year, where this fascinating radio controlled model has demonstrated viceless flight characteristics which,



for all its unconventional appearance make it a truly excellent pilot trainer for radio control.

Looking for all the world like a powered kite, that in fact is in many respects exactly what the *Windbag* is, the main 'wing' consisting of a wind-inflated flexi-foil which takes its form during the take-off run. The *Flexiwing* sits on its mast high above the fuselage pod which mounts the 40-60 rear positioned engine, three function radio gear and foreplane.

We have flown this 6ft span craft which is quite the easiest we have found to fly in 24 years of radio control model flying and we can only wonder why no one came up earlier with this brilliant concept in model kit form.

Certainly it brings a new meaning to foolproof R/C fun and one well worth investigating. Kits are in the shops now.

### Pace Aerobatic team

Aerobatics is part of any full size air show these days. During this year, more than 100 displays throughout the UK will be getting the Pace Aerobatic Team treatment



of spectacular flying by top British aerobatic pilots Richard Goode flying the Pace Spirit and Peter Kynsey in the Ultimate Pitts S-1S.

Quite apart from providing spectacular flying displays, the Pace Petroleum sponsorship has a very serious purpose in assisting

promising but proven British amateur pilots in their efforts to achieve higher standards in national and international aerobatic competitions — a very worthwhile sponsorship.

Congratulations Pace Petroleum!

### French statistics

Published facts in the Federation Francaise d'Aero-Modelisme Bulletin 'Info Model' reveal that at the end of the 1982 year, the FFAM had a total membership of 10,238. This figure was broken down to 8,445 seniors, 546 juniors, 913 'Cadets' and 316 others. The FFAM has 435 organised clubs and operates on an annual budget of £96,000. By comparison, the figures for the SMAE over the same period were total membership 6,682, comprising 3,916 seniors, 448 juniors and 2,318 associates, operated on an actual turnover of £53,000. Each of the organisations has its own permanent office and secretary with assistants. While the bulk of the revenue for the FFAM comes through membership fees and insurances, amounting to some £45,000, there is no obvious revelation of Governmental assistance in their statistics. Both organisations have identical difficulties in supporting their teams when they travel World Championship events. There is a significant difference in the French support for the younger modeller Encouragement for the Juniors and Cadets, who amount to almost 1,500 is a reflection on the club system throughout France which has yet to be totally enveloped by the influences of radio control.

On that subject, the French have just negotiated use of ten new spot frequencies in the 26MHz band from 26 815 through to 26 905 which are intended to relieve the interference factor from CB frequencies. This will presumably be admissible at the 1984 World



Championship for Flying Scale which is to take place at the famous Le Bourget Airport, Paris.

### Combat International

The International Combat event run for the last two years at Dytchley's Manor has not been sufficiently well supported by continental modellers and so Mike Hember and Paul Vallins have decided to move the organisation over to Belgium. Now known as the Anglo-Belgian Combat International 1983, the event is scheduled at the purpose built Control Line circles at Genk for August 6 and 7. This provides an ideal central location for all European competitors. The amenities include six circles, a large R/C area clubhouse bar, showers, toilets, camping area and car parks. An additional attraction is the low entry fee of 500 BF (approx £6) for all competitors, amenities being free not only for competitors but also for all supporters. Similar European based Combat events have not been held since 1981 and it is hoped that Combat flyers from all the European nations will produce at least 60 entries.

Information is available from Mike Humber, 19, Felix Ave., Crouch End, London N.8.

### Falklands Test Force Commander to open Model Engineer Exhibition

Rear Admiral Sir John Woodward, KCB, is to open the 53rd Model Engineer Exhibition at the Wembley Conference Centre on Saturday December 31, 1983.

Admiral 'Sandy' Woodward, as he is better known, has had a most distinguished Naval career and rose to public prominence during last year's Falklands campaign, when as Task Force Commander, he successfully led all three services in the British recapture of the Falkland Islands.

Admiral Woodward is the first serving member of Her Majesty's Armed Forces to open the Model Engineer Exhibition.

### M. R. Knight MBE

How delightful to discover the designer of those pioneer rubber duration models *Kinglet*, *Kamlet*, *Avis* etc. among the Royal Birthday Honours list! Though still very much interested in Aeromodelling, and the Senior among the Fellows of SMAE, it was for services to journalism that Maurice Knight has been honoured with an MBE. Still actively contributing to his newspapers at Faversham despite his 86 years 'MRK' more than deserves this award and every vintage model enthusiast will join in congratulating Maurice. Among his features in the *Sheerness Times* - *Guardian* we specially liked the account of a highlight in his life — a flight in Concorde at Mach 2 in which he reminisced on the windy cockpit of

the RNAS BE2c some 65 years and 33 aircraft types earlier in his remarkable career.

### First ever Aerojumble

Something quite unusual in aviation related fields is the Aerojumble which takes place at the Fleet Air Arm Museum, Royal Naval Air Station, at Yeovilton in Somerset on Saturday October 1. The organisers say there's never been anything like it before — a gigantic outdoor jumble sale for anything and everything to do with aviation.

### † Fred Longbon

Free Flight Scale lost one of its staunch supporters when Fred Longbon succumbed to cancer on May 26th. His tall figure with that deep London accent and practical approach to a wide range of popular subjects made Fred an outstanding character. Always among the earliest to arrive at our Old Warden Scale Days, he was gifted with a rare eye for accurate reproduction of shapes. His ability to sustain a large collection of oil stained and remarkably strong, scale models of light aircraft types, brought him a considerable following. Among the most popular designs from his board were the DH 80 Puss Moth and Flying Flea, hundreds of which have been built following publication in *AEROMODELLER*. His experience spanned almost 40 years of continuous activity and his figure will now be sorely missed at Epsom, Chobham and his cherished Old Warden. Our sympathies go to his family and in particular to his wife, Anne.

### † Jack Marsh

SMAE Annual General Meetings have centred on Leicester for some time now, and it's no coincidence that the HQ office became established at this same central city. Few realise how much of this ideal location stemmed from the administrative influence of Jack Marsh who suffered heart failure during a surgical operation on June 9.

A founder member of Leicester MAC in 1936, Jack served the model movement as a true champion for the great cause of locating and securing flying sites. He stimulated SMAE participation in CCPR and the Sports Council in spite of antipathy. As President of Leicester MAC and Treasurer of the Midland Area SMAE he was a meticulous enthusiast who sacrificed his own very active participation in power model contests for the sake of others in search of places to fly. Aged 59, Jack will be sorely missed by his many friends and those who have good reason to thank him for his great efforts.

## What's On . . .

June 25/26	<b>NEWTON AYCLIFFE MFC SPONSORED TWO DAY COMPETITION</b> — F2B Senior, Novice and Junior. Sunday entry possible. Two rounds per day and fly off subject to entries. Venue: Newton Aycliffe Sports Complex, camping and caravan facilities. Contact: Barry Robinson, Tel: (0325) 315215.	July 17	<b>SHUTTLEWORTH MODEL GROUP OPEN DAY</b> . Free Flight and Control Line plus Stand-off Control Line Scale competition. Venue: Shuttleworth, Old Warden, Beds. 9 am to dusk. Contact: Mick Staples, 11 Whitehill Road, Cambridge CB5 8LT.
June 25/26	<b>RAFMAA / SMAE THURSTON TROPHY COMPETITION</b> — F1A, F1B, F1C. 1st round commences 12.00 hours on 25th. Champagne progressive fly-off for F1A, F1B, F1C on Saturday evening. Venue: RAF Barkston Heath, Nr. Grantham, Lincs. Camping allowed on airfield. No pre-entry. RAFMAA and SMAE members only. Contact: Fit Sgt. Baines, Tel: 033 483 471 Ext. 420 (working hours) or 0526 21458 (weekends).	July 17	<b>WHARFEDALE OPEN DIESEL COMBAT COMPETITION</b> . Engines 15 to 19 cu No pressure. Props 8 x 6. Venue: Dewsbury, West Yorks. Contact: Jeff Smith, Tel: Leeds (0532) 663432.
June 26	<b>PETERBOROUGH MFC. A COMBAT COMPETITION</b> . Venue: River Embankment, Peterborough. Contact: Brian Waterland, Tel: Market Deeping 343722.	July 17	<b>'FUN-FLY'</b> by Red House Aeromodelling Club HLG. Open Rubber Scale. Simple Pennyplane and a novelty event. Venue: Red House Comprehensive School, Sunderland. 2pm-6pm. Contact: J. Waters, Tel: Sunderland 482280.
June 26	<b>SMAE INDOOR EVENT</b> . Contact: L. Barr, Tel: (0628) 25595.	July 24	<b>1st FID TEAM TRIALS</b> (3 flights). Houlberg Gold Medal. RAF Cardington.
June 26	<b>WHARFEDALE OPEN MINI GOODYEAR COMPETITION</b> . SMAE rules but no age limit. Venue: Contact: Jeff Smith, Tel: Leeds (0532) 66342.	July 24	<b>FACCT OPEN THERMAL SOARING EVENT</b> . BARCS League event. Entry fee £2 + SAE + frequency. Venue: RAF Weston-on-the-Green, Berks. Contact: N. Webb, The Bungalow, 13 East Street, Frittwell, Oxon OX6 9PX. SMAE members only.
June 26	<b>NORTHERN AREA SMAE CLUB TEAM CHAMPS</b> . Free Flight. Venue: RAF Church Fenton, Nr. York (SMAE only — restricted parking). Contact: John Godden, Tel: 0532 521002.	July 24	<b>SMAE SUMMER SCALE MEETING</b> . Control Line Scale Class 2 + Scale Racing. Venue: RAF Abingdon, Oxon. Contact: Vic Willson, Tel: Reading 471964.
July 1	<b>FRIDAY EVENING FAI TEAM RACE</b> . Venue: Burtonwood Airfield, Nr. Warrington, Lancs. Contact before the next event: essential. Tel: Jim Woodside 051 7241442.	July 24	<b>NORTHERN AREA FLY ANYTHING DAY</b> . Venue: RAF Church Fenton, Nr. York. (SMAE members only — restricted parking.) No contests. Contact: John Godden, Tel: 0532 521002.
July 3	<b>ELMBRIDGE CLUB STUNT COMPETITION</b> . F2B and Novice Stunt. at Elmburgh Club Circle, Fairmile Common between Esher and Cobham, Surrey. Contact: M. Radcliffe 01-397 4407, for details.	July 31	<b>NOVICE STUNT COMPETITION</b> . Venue: Thones Park, Wakefield. Contact: B. Temporal (Secretary Wakefield MFC), 45 George Street, Horbury.
July 3	<b>SMAE CENTRALISED MINI FREE FLIGHT</b> . A. 1. A. CdH. CO. HLG. Venue: Driffield, Yorks (SMAE members only). Contact: D. Hipperson, 35, Anthony Rd. Boreham Wood, Herts. WD6 4NF.	August 6	<b>CONTROL LINE AEROBATICS COMPETITION</b> . Venue: Thones Park, Wakefield. Contact: B. Temporal, Tel: 0924 270690.
July 3	<b>WALSALL OLD TIMER R/C ASSIST DAY</b> . The best in the Country Class 1-2-3 Texaco. Everyone welcome, entry on the day. 10 am onwards. Venue: Aldridge Airport, Walsall, W. Midlands (M6 Junction 7), Contact: J. Shelley, Tel: Walsall 28553.	August 6/7	<b>JUNIOR KIT CONTEST</b> . Sutton Park — Sutton Coldfield. Details contact: Dave Hipperson 35 Anthony Road, Boreham Wood, Herts. enclosing an SAE Pre-entry 40p to Dave Hipperson by 16th July or entry on field same fee.
July 3	<b>CONTROL LINE 500 LAP GOODYEAR MARATHON</b> (SMAE members only). Venue: Dishforth, Wakefield. Contact: B. Temporal, Tel: 0924 270690.	August 7	<b>ANGLO-BELGIAN COMBAT INTERNATIONAL</b> — Genk. Entry £6. Contact: Mike Hember, 19 Felix Avenue, Crouch End, London, N8. Telephone 01 272 7766 X 3467.
July 8	<b>CHUCK GLIDER CONTEST</b> . Venue: Littleton Road playing fields, Salford, Lancs. Contact: M. C. Reeves, Tel: Rochdale 44999.	August 7	<b>THREE KINGS OPEN CARRIER SCALE AND PROFILE EVENTS</b> . Silencers and Insurance needed. Venue: Old Croydon Aerodrome, Purley Way. Contact: D. Bird, Tel: 01 874 6394.
July 9/10	<b>MODELLING WEEKEND</b> . Venue: Newby Hall, Ripon, North Yorkshire. Competitions, displays of Off-Road model cars, boats, wargaming, model engineering, plastic modelling, helicopter displays etc. For further details, SAE to R. Thorn, 22 Chatsworth Place, Harrogate, North Yorkshire.	August 7	<b>SMAE CONTROL LINE EVENT</b> . FAI Team Race, Goodyear, A Combat, Novice Aerobatics, Speed. Contact: R. Horwood, Tel: Bristol 48769.
July 9/10	<b>CLAPA CHAMPIONSHIPS: FAI CONTROL LINE, Aerobatics, Open Novice Stunt, Open Carrier, Open Scale</b> . CLAPA Members only. Venue: Essex Showground, Braintrae, Essex. Contact: P. Burgess, Tel: 0376 516881.	August 6/7	<b>WOODVALE RALLY</b> . Venue: Woodvale, Southport, Lancs.
July 10	<b>CANTERBURY PILGRIMS MFC NEW AIRSHOW</b> . Static Class 2 Scale, Team Displays or individual, trade flying displays welcome. Venue: Graveney, Nr. Faversham, Kent. Pre-entry details and forms contact: Bas Brazier, 8 Norfolk Road, Canterbury, Kent. Tel: 61199.	August 14	<b>SCALE &amp; VINTAGE DAY</b> (SMAE members only — restricted parking). Venue: RAF Church Fenton, Nr. York. Contact: John Godden, Tel: 0532 521002.
July 10	<b>BRITISH CONTROL LINE COMBAT CHAMPS</b> — 3rd round. Venue: River Embankment, Peterborough. Contact: Brian Waterland, Tel: Market Deeping 343722.	August 14	<b>SMAE INDOOR EVENT</b> . Contact: L. Barr, Tel: 0628 25595.
July 10	<b>SMAE INDOOR EVENT</b> . Contact: L. Barr, Tel: 0628 25595.	August 14	<b>FREE FLIGHT CLUB CHAMPS</b> . Everleigh 10am contact: Dave Hipperson, 35 Anthony Road, Boreham Wood, Herts. WD6 4NF.
July 10	<b>CROOKHAM GALA</b> — Open Rubber, Open Glider, Open Power and all-in FAI. Five flights with no rounds. Start 10 am. Venue: Beau lieu Old Airfield. Contact: D. Cox, Tel: Ashford (Middx) 51696.	August 21	<b>SCOTTISH VINTAGE EVENT</b> . Scottish aeromodellers will have their own vintage event concurrent with the Aeromodeller Vintage Day on August 21. Site for the event is Newbigging and is open to all Scottish vintage enthusiasts. Further details may be obtained from Bruce Duncan, Burngrange Farm, Burrellton, Perthshire, Scotland, PH13 9PL. Tel: 08287 374.
July 10	<b>MORLEY &amp; DMAC MICRO/MINI/SILENT VINTAGE EVENT</b> — P.30, Wigan 70, CdH, A. 1, Silent. Venue: Heath Common, Wakefield, Yorks. Contact: J. Godden, Tel: 0532 521002.	August 21	<b>AEROMODELLER VINTAGE DAY</b> . Venue: Old Warden, Biggleswade, Beds.
		August 21	<b>COLCHESTER MAC</b> . Mini fun 100's contest. % Scoring. Best of 3 out of 4 rounds plus fly off. Trophies, spot prizes and champagne for longest flight of the day. £1.50 + freq. x 2 to Caroline Close, Broadfields, Wivenhoe, Colchester, Essex.
		August 27/29	<b>CONTROL LINE &amp; RADIO CONTROL NATIONALS</b> . Venue: Barkston Heath.
		August 28/29	<b>EUROPEAN CHAMPIONSHIPS TEAM TRIALS PART II</b> . F1A, F1B, F1C. 7 rounds. Contact: Dave Hipperson, Tel: 01 207 0179.



# Free Flight

Report  
and pictures  
by  
**DAVE  
HIPPERSON**



**I**T HAS BEEN some years now since the ISMAE introduced the 'split' Nationals where Free Flight is run on a different weekend to the Radio and Control Line events. Contrary to the arguments aired at the time suggesting Free Flight would dwindle away without the draw of R/C to support it, almost the complete reverse has been true. If entry numbers is the yardstick, then Free Flight has benefitted immeasurably from the increased space available. In fact to the point now that entries for this part of the Nationals not only exceed the entries for Control Line and all Radio classes including Thermal Soaring but the British Free Flight Nats emerges as the largest model aircraft event of any type run anywhere in the World! Winners can therefore be justly proud that they have won rather more than just another National event.

## Mini-Day (Saturday, May 28th)

So here we were once again at Barkston Heath and the dawn of the first day was really a continuation of the appalling wet and cold that had become a feature of the '83 Spring. Thankfully, despite the weather's wintry appearance, the drift was quite light by the start time of 10 a.m. and by mid-morning, when it had ceased 'chucking it down', flying got underway. Most were relieved just to warm up running around.

One event to benefit from the damp conditions was CO<sub>2</sub> Duration as these sensitive power plants love damp air as even cool air is warmer than the gas on which they run. CO<sub>2</sub> is usually a fill-in event after contestants have completed their main classes. This year it started early, the crafty ones using the damp low cloud base 'clearing up period' to post quite a few maxes.

The first max of the Nats, actually recorded was from CO<sub>2</sub> flyer Steve Philpott, but in HLG after he had been spurred on by the news that there was a prize for it! The first complete and perfect total however came from Phill Ball's CO<sub>2</sub> model and soon he was joined by more. Most encouraging for a class that had not taken off as well as had been expected. In A/I Glider last years winner John Cuthbert spoilt it straight away with a dropped flight whereas Sheen, Harris and Owens all made promising starts. Phil Owens actually continued well right through the day until a cruel 50 sec. final flight robbed him of a chance in the fly-off and perhaps the National Glider Championships although no one could have foreseen what a weekend it was to be for him.



Top left: lady helpers launching in the A/2 glider contest are Ros Hubbard for Dave Hubbard of Watton, Norfolk and Pamela Harris for husband Peter of Maidstone. Line up led to many exciting mass launches and one mighty boomer which took 15 models away simultaneously. Above and right: DPR Models Chuck Glider Contest attracted many youngsters on each of three days at Barkston Heath. This happy group was found chucking off under the guidance of Cyril Green, control line judge and faithful helper at many a Nats. Eventual winner was nine-year-old Jonathon Williams.



Left: Open Rubber winner M. Howick gives his swept wing design the heave-ho. Above: Ian and Christine Kaynes in Wakefield. Ian emerged Overall National Rubber Champ after so narrowly missing the same award last year.



# Nationals

700 Entries made this the biggest model flying event anywhere.

The cloud base made things a little risky in **1/2A Power** early on, but caution meant few disappeared and by the time the rain stopped, the Contest Director was allowing timekeepers to follow on foot, so this lessened the chance of downwind disappearances too. Power Champion from last year Screen made a mess of his 3rd flight in this class with a 1:21 from a very short run with a model with which he has never looked happy. It was good to see Bob Bailey back at the power game with a very neat and modern looking F1C influenced 1/2A layout. He had a full score right to the end when an extraordinary rough run that sounded like a '40 coming loose on its mountings but put down to damp tissue, ruined a full score with a 40 second flight. Trevor Payne, last year's **1/2A** winner had lost a little time on the first flight and then trimmed another few seconds off the last to come in 4th. Maurice Gilmore, despite a rather dated and simply equipped model, flew with great consistency and a very tidy pattern. He must have been kicking himself for a first flight of 1:53 that kept him out of the fly-off — he finished 3rd.

The Hand Launch Glider flyers really had it hard. Running over long, soft, damp grass must have been difficult enough, but the lift there was slight. It really did put the emphasis on Chuck rather than Bump. Bill Simms did very well to come so close to a full score and just scrape in ahead of previous Nats winners Dave Edmonson and Phil Ball. The times could hardly have been closer and the top five slots were filled with well known names. A test of trimming skill and model performance rather than thermal picking for a change. At least this one result had been decided when the main flying finished at 7 p.m.

The fly-offs really had the best part of the day with actual glimpses of evening sun occasionally. Cooper and Beal went to duel it out in **A-1**. Cooper was using a model with a one-piece Wakefield wing built for his trip to Taft a few years ago, but never considered good enough — but it seemed to work as a glider. He towed enthusiastically and folded the wings at the top of the line! This left Gordon Beal downwind knowing that he could win with any length flight. He admitted to enjoying this feeling greatly and the pressure so removed produced a beautiful piece of towing in the cool evening and a near 3-minute flight in light lift resulted.

**Coupe d'hiver** looked interesting. Gerry Ferer, always very consistent in this class was up against George Sharp recently coming to form and Ian Davitt with a model that even he would admit is happiest in thermals. The unknown quantity was young (only last year a Junior) John Walker. This group assembled and first to risk it having walked out fully wound was George Sharp. He flew in what was possibly the best patch of air but couldn't make use of it as a rather too energetic launch had the model half loop half wingover back into the runway. A few moments later Walker released to a respectable if not sensational climb and for some reason best known to himself Davitt insisted on launching under this flight but not until he had chased it a good

way across the drome! It wasn't the sort of air to run after and he simply duplicated Walkers flight — they were in the 1:20s. Still not having flown, the betting had to be on Gerry Ferer and he had plenty of time in hand. He wound and waited and the air grew steadily colder. Eventually his patience ran out and the cooked motor combined with a horrible hole, resulted in an extraordinary flight that actually didn't climb at all after the first 4 or 5 seconds of the run. There was hardly enough altitude left to notice any glide. Everyone's attention returned to those two earlier close flights from Walker and Davitt and the watches made Walker the winner by 4 seconds.

Russell Peers' back on form in **1/2A**, came out next to fly off against Marcus. This was Russells first **1/2A** fly-off for some time thanks mainly to clubmates insisting that he be more choosy than usual with the air he flew in during the day. He was up against it though. Marcus had been fiddling about with various power models for some years, but this was the first occasion he had used one in anger. He had reached the fly-off with a most unconventional layout. Norman obviously loves wire bending and had equipped this large pylon less model with every conceivable function actuated by a Seelig Wakefield timer with a power launch release and home-made shut-off fuel valve in the tank to the suction fed Cox TD051 motor. He was even modest about the output of the motor, but did admit to having worked some on the prop. The two were away promptly. Norman virtually on the hooter. They reached similar altitudes but Peers' model fell from the sky very rapidly, whereas Marcus's continued gliding for a fine still air win. One of the most interesting models on the field that day and he attracted such a crowd of admirers after this flight that many may have missed the CO<sub>2</sub> fly-off that followed.

It was no secret that Ball and Philpott were favourites for this. Ball's new model particularly had been quite extraordinary during the day, regularly running for 1:45



Above: Wakefield winner George Foster prepares for his seventh flight. Right: ace of FAI Power event Stafford Screen won this year, topping a four-man fly-off. Far right: John Cooper prepares for the A/2 final in which he topped the all-important fly-off and also took top honour as Overall Nationals Glider Champ.







Above left: John Walker prepares for winning Coupe d'Hiver fly-off flight.  
Above: R. Cherry looked this cross even after he had won CO<sub>2</sub> duration fly-off with tremendous 4:50 flight.



and climbing all the way. Big flights looked in order. Philpott was away first with his distinctive nose mounted pusher that had won for him last year — his flight looked very comfortable. Staines followed and came in tight for less than 30 secs with his Dowsett design. After much deliberation Ball launched and although safe the air was not what he had been flying in all day and he had trouble clearing 2:20 — quite obviously Philpott had beaten him. However a newcomer to this had something up his sleeve. Cherry with a quite small but obviously very light model, launched last much later on and straight into beautiful air of which his slow long running motor took every advantage. After nearly five minutes he had it in the bag and the other two had to be content with lower placings than usual. This turn about has probably done more to encourage flying in this class next year than anything else could have. People were still trying to take Norman Marcus's WA model apart as the first day drew to a close and thoughts turned to the Open events scheduled for the next morning.

### Open Day (Sunday, May 29th)

The low cloud had returned for the start of the Open events on the Sunday. Even the prize for the first max could not tempt anyone to risk it. It was more than half an hour before Bernard Aslett recorded it and from then on the cloud lifted quickly to allow safe flights even for power models beneath the heavy overcast. The westerly drift swung northerly and reduced, allowing the full use of one runway and keeping most models on the drome. Indeed conditions were so perfect at this stage for Power and Rubber that huge fly-offs were predicted right away. Glider on the other hand was much slower to start and many of those impatient to fly early were to drop flights in the neutral conditions. It was interesting to see however that John Cooper had a full score in early. As the weather warmed up around lunch-time, full scores in this class soon became the rule rather than the exception.

Forecasts that **Vintage Duration** would become a *Lanzo Stick* event were proved false as one by one the versions from Davitt, Peers, Ferer and Dilks all dropped flights — admittedly the latter only 5 secs and enough to hold on to 2nd. No, this year it was the turn of Phil Ball's *Hi-Ho* to lead the way, but not before last year's victor Ray Moore had posted two maxes with his trusty *Halfax Rapiere* and left us in suspense waiting the return of the card. Alas, the model had been lost and Ray couldn't continue. It spared Ball two fly-offs in one night.

Slightly more entries this year in the very specialised event for **Tailless** models and once again it was dominated by rubber designs. The 'master' John Pool, making one of his rare appearances to hold onto the Lady Shelley trophy with the only full score. He muttered something about the beneficial effect the picture in last year's *Aeromodeller* report had on the model's performance. Worth looking up, as in the excitement we forgot to snap him this time! Once again Ian Keynes was 2nd with just a few seconds dropped from his last flight.

At the close of the main events at 6.30 p.m. there were nearly 80 people involved in fly-offs. Whilst they prepared and caught up with the control van as there had been a wind shift and a slight move of launch point, the **CO<sub>2</sub> Scramblers** had a go. Thirty minutes of intense activity where the aim is to record as much air time as possible in the allotted period involves considerable physical stamina. Thankfully it was cool and perhaps this contributed to the considerably higher totals and closer finish than last year. Ian Davitt topped it again with the same model as last time, but was closely chased by Staggs and Coomes using well trimmed sports models and Tipper, who was 4th, using what appeared to be a *Lacy Lady* peanut scale!

At 7.30 the hooter blew the first time for the fly-offs for the **Women's Cup** and over the same period, as numbers in this were relatively small, **Frog Junior**. Both the Women's cup winners from the last few years Sue Coy and Barbara Tyson had dropped flights — Barbara an unlucky two seconds on her last glider max, so the fly-off was

between Joyce Joiner using an O'Donnell designed *Delinquent* and Jessica Nash flying a very impressive own design rubber model with some Fred Boxall influences. Jessica was away first, cleared 4 minutes and won it by a handsome margin. The **Frog Junior** was a much closer affair. All rubber models apart from Anderson at a distinct disadvantage with a glider. Credit to him therefore that he should record a time that would have placed him 4th in the Seniors **Open Glider** fly-off to be held later! He squeezed in between the two Dixon brothers, the younger one doing better to take 3rd. This left the way clear to Jim McDonald last years winner to do it again with a 3:45 winning flight from his rubber model.

A large percentage of those that had flown in **Open Power** had recorded full scores. During the day there had been some exceptionally fast climbing models to be seen — Ken Faux's being particularly impressive. The effect on the adrenalin flow even to a spectator in the midst of a fly-off involving more than a dozen such machines is quite extraordinary. Perhaps the grid of a Formula One race is the nearest comparison. All the contestants very tense, concentrating on quick starts and accurate launches. The rush was triggered by Faux starting and it was Screen and Hopper who led the way. They were both on superb form and way up with Hopper's, perhaps just the highest and looking all set as surely he had the better glide. All three of the Smith family were there too — Tom releasing in this early period to a slight cough, but still a tremendous altitude almost vertically

Left: after so many years of free flight contest activity, mainly in rubber power, Norman Marcus finally took the plunge into free flight power competition and promptly won 1/2A Power with suction fad Cox .051 power. Close-up below shows Seelig Wakefield timer which triggers home made fuel shut off in the tank and other functions. Quite a wire benders exercise. Right: Phil Owens should look a little more cheerful, he won the Open Glider fly-off. Far right: Gordon Baal won A/1 Glider event with this 'Simplicity' design. Any chance of a drawing Gordon?



Aeromodeller



overhead. Trevor Payne flew the same model as he had won with at Easter — much faster than its predecessors and this was chased by the second Smith to launch — Jeff, but a slightly out of phase roll gave a poor transition and loss of valuable height. Ken Faux's promising day ended as his very fast model went flat and overran, thankfully cutting and pulling up before it reached an upwind hangar — no damage, but a tiny adjustment Ken had made before this flight had been too much. Staines and Cummins flew around this time and judging by the final scores which were very close, there must have been a large buoyant patch of air into which most flew — the early very high climbers not necessarily benefitting from it as much as the rest. Half a minute spread the top seven times and all of them in excess of seven minutes. As the din and dust settled and those remaining on the launch 'pad' had time to readjust their hearing, the glider flyers were already preparing as count-downs from the PA kept everyone aware of the time. In power that early flight of Tom Smith had won him the Sir John Shelley again and Cummins from a lesser climb had found the best air to take 2nd with only one second less. Payne and Screen had actually tied for 3rd place and mysteriously Hopper had come down in 20 seconds less than these two and had to be content with 7th. Only Screen, Hopper and Cummins' models left the field.

Twenty-seven had qualified for **Open Glider** and spaced themselves well out to avoid line tangles as much as possible when the inevitable circle towing began. Fantham released early and took eight to 10 others with him just because they saw him go. The air was good enough for a big two-minute flight, but nothing else. Fantham comfortably out-flew those who had followed him. The lone big Open model — the rest were A 2s — was in the hands of John Carter and had already proved its effectiveness this season. Tonight however, he couldn't find the right air and was down for a disappointing 2:33. Towing almost constantly through the round were Madelin and Owens and they eventually released seconds from the hooter. More than likely sufficient surface activity on the runway downwind had been generated by other competitors running around to break some lift-off, albeit gentle. Madelin's flight was good enough for 4th, Staines (having a busy evening) and Cooper managing something

a little better earlier on, but Phil Owens centered in the only actual lift to win the Thurston Trophy with a fine 3:38.

With conditions this dead, we were in for an interesting **Open Rubber** fly-off as long as the failing visibility didn't ruin it. This final event was to be one of the largest Open Rubber fly-offs in history and before too long the air was literally filled with models. Mike Howick launched quite early using a new and rather unconventional swept wing layout designed to allow a longer fuselage and hence longer motor. This 400sq. incher centered into good air, whilst many others were still winding. Carter, now flying a more conventional-sized model, produced a tremendous climb whilst his clubmate Dilks was less lucky and spun in his all red Lanzo fly-off model. There was drama in the Aslett camp as Bernard, using his very light black and white fly-off model, had been a little too enthusiastic whilst winding. The resulting bunches in the motor took some persuading to go back into the fuselage.

Nevertheless, the model got away, but only to explode in the air a few feet out of his hands as the whirling bunches knocked out one too many spacers. The wing and tail section fluttered back to earth and fragments of fuselage sprinkled back down as onlookers stared in disbelief. Grantham clubmates Ball and Coome flew similar locations about halfway through the round and a couple of minutes apart. Coomes' 500sq.inch model looking promising at the start, but losing height steadily once into the cruise and glide. Ball launched next, the distinctive shape of his now famous tapered model drawing quite a crowd and a number of gasps when the model hesitated and tail slid after a rather too steep and slightly left banked launch. It recovered and began its slow but steady journey upwards.

There was more drama as John O'Donnell had blown a motor with only 5 minutes to go. He was having difficulty getting the pieces out of the winding tube. Time was running out as he began to wind again and a countdown of the time he had left over the PA both highlighted the drama and allowed him to pace himself and not mess up the winding. He was ready just in time and launched two seconds inside the round. A spectacular climb was still not enough as the air had cooled further now and his 6½ minutes placed him 8th.

As other times came back it was Ball who led with an eye-straining 7:43 in the gloom.

John Bailey had found good air too and recorded only a few seconds less, but then Howick's card arrived and his early flight had clocked 8:35. He had won the Model Aircraft Trophy. It was interesting that he should have scored such a high time as his clubmate Lee who releases adjacent to him and at the same moment managed only 5:10 so either he had a very small patch of good air or a rather special model. Ball had the consolation in the runner-up position again of further consolidating his position in both the Senior Championships with a 1st, 2nd and two 3rds in the first two days of the Nats and as the most consistent Open Rubber flyer.

### F.A.I. Day (Monday, May 30th)

The 6 a.m. start for F.A.I. was an experiment and probably even those really keen on the idea in principle were having second thoughts when they realised at what time this meant getting up! The thinking behind the idea was to allow seven flights, as we had the aerodrome until later than usual and hence give a more important 'feeling'. It was also hoped to reduce the fly-offs drastically by coinciding at least one early round and probably two, with liftless conditions. Neither of these experiments were a total success, but a very satisfactory contest resulted. The weather — light winds and reasonably high cloud base allowed the full max. to be employed and it stayed that way for the whole day. Wind direction was less co-operative but restraint by retrievers and friendly co-operation from members of 25 Squadron who assisted in retrieval around the more sensitive areas, allowed the contest to run without a hitch. Early rounds, particularly in **Glider** were decisive. Only nine maxed from the 80 man field in the first round. Included in that nine was Dick Sheen who was to drop later, but had the consolation of having scored the first max of the day and with it won sufficient liquid refreshment to drown his sorrows properly later on. Also maxing this round was Phil Owens having a very good Nats and incidentally finishing runner-up in the overall Nationals Glider Championships, his clubmate Nicholson plus Williams, Tipper, College, Cordes and others.

In **Wakefield** the first round proved less of a problem with 17 of the 40 odd who flew having no trouble, although it was surprising to see Ivan Taylor dropping vital time here — it was to keep him out of the fly-off. The decline in the numbers flying FIC is becoming so rapid now that their first round was not considered as a possible noise nuisance by the organisers even at this early hour. So few fly and so quickly, that it was over in a flash. Of the favourites, only Dick Johnson dropped time.

It took a few rounds for fliers to settle, although conditions remained quite steady right through the early rounds. By Round Three, when we would have usually have been starting, glider and rubber, fliers had the measure of the conditions with no less than 35 maxes in FIA. Incredibly, this glider total included only four with a full score. They would continue unchallenged right up to a fly-off later that night. If it had stopped at this point we might have had the same result! It was here that Baggott, Bailey and Chilton dropped flights in Power. A pattern of well-known names was emerging here too — five had full scores.

It further illustrates how conditions were warming when one considers from mid-morning, glider performances improved as



the air became easier to read on the line, whereas Power and particularly Rubber fliers who can max in dead air but not in downdraughts, had more trouble and maxes became fewer. Round Four saw 58 glider maxes compared with 27 in Wakefield and Brian Spooner dropping in Power after having some motor trouble. His 2:30 flight left the way clear for the eventual fly-off finalists in this class too. Now literally clouds of models were descending dt'd into the out-of-bounds area and there was a nervous period just after the lunch break when a change of location looked inevitable if only to take the pressure off the R.A.F. personnel. Just then the wind swung further south and dropped. Models were now travelling far less and most stayed on the 'drome again.

The penultimate round in glider saw more maxes than any other — 58. Bearing in mind that a number had stopped flying by this time, it represents a very high percentage. In Wakefield, far fewer — only 10 and amongst the dropped flights we counted Dave Greaves with just one second off and a disastrous 2:07 from equal leader Ian Kaynes. Still, there were the same four perfect totals in Power.

The final glider round showed fliers not well practised, tiring. People had been up a long time now and the air was cooling. This A 2 round coincided with a cool breezy patch and a mere 20 maxed including of course the leading four. Perhaps many were pleased to have just finished and although nowhere near catching the leaders, they were at least still standing up! It was a credit to the glider flyers that nearly 70 of them

should continue to the end in this way. Certainly useful practise for all concerned.

Until Kaynes had dropped time in the 6th F1B round, this class looked set to go to a four-way fly-off like the other two. Now the tally was down to three and Howick, winner of the Open the night before and still with a full score, must have felt confident. Of the full scorers to that point, he flew first on the thermistor that always seems so reliable for him. The early part of the climb looked respectable, but sadly the glide was in sink and a fly-off chance for World Championship team member Mike was snatched away.

Fly-offs were run from 7 p.m. to an increasing max., starting at 4:00. The C1D was beginning to sound like the talking clock by this stage as he gave second-by-second countdowns to the starts and finishes of every round, but it certainly avoided the misunderstandings of the year before. Glider first and the qualifiers were Haken from Holland — no stranger to the British Nats, having been a fly-off qualifier here before — Brian Baines and last year's pair of finalists Fantham and Cooper, the latter already home and dry, the National Glider Champion. John is on record as saying he never does very well at the Nats! He was off the line first and away on his own in good air sufficient for a max.

Haken was towing for some time upwind and Fantham carefully positioned himself downwind also on tow. Baines was still on the ground to one side, watching. Haken released into good air and as the model reached Fantham, he too towed and catapulted a little downwind of the approaching



Haken. This proved to be where the best air was as Mike rode it to a max., whereas the Dutchman was down short. Baines was towing now and the end of the period was approaching. The best air had gone, but his 2:55 was to prove enough for 3rd place. Cooper and Fantham would have to have a re-run just like the year before.

Wakefield was now two-way between George Foster also of the RAFMAA and George Sharp a rubber flyer of old who has recently come back onto form. It will encourage those who dispute the desirability of electronic thermal detectors that Sharp had reached this stage and the Open Rubber and Cd'H fly-offs on the previous days with dependance on nothing other than instinctive thermal picking. Jolly useful when the batteries go flat. Here were two very similar aeroplanes of medium-high aspect ratio, equivalent area distributions and conventional 45 sec. prop runs. Sharp was ready on the hooter but didn't fly immediately which might have lost him the contest. When Foster launched a few seconds later, the beginning part of the climb was not in good air, but the model worked into some downwind, suggesting that a good patch had gone through earlier. Sharp's flight made some 90 secs. after Foster's was never going to match it as he was in steady sink. Foster had won the Boxall Trophy with a clean 4-minute max. and very deservedly too, after having put up so many high performance scores in past events, but always having the really big wins elude him. Certainly he is one of the leading Wakefield fliers in the Country now.

Next came Power and we were one man



Above: John Bailey gets FAI Power model away. Above right: enormous and very fast, fluorescent green and white monster. Flown by Trevor Payne to third place in Open Power Event, tying with Stafford Screen. Right: Russell Peers took second in 1/2 A Power. Far right: expression on Ken Faux's face indicates some kind of love-hate relationship with his FAI Power model here getting a dose of the typical vertical chuck-offs!



**Far left: highly athletic hand launch from Klempe of West Germany gets Wakefield on its way. Left: George Sharp, another Wakefield contender took second place. Right: getting ready for 'Down Under,' the British Free Flight team for the World Champs assembled for a briefing from team manager Martin Dilly during a lull in activities.**



short. Ken Faux had mislaid a model on the last rather breezy max. and incredibly was not prepared to risk another — not even for the Nationals! The fly-off became a Birmingham benefit involving only Monks, Harris and Screen. To lessen the risk of loss and practically guarantee that another fly-off round would be unnecessary, the three made a gentleman's agreement to fly from a 5-sec. run. At least this ensured that none would suffer an over-run of the official power run it was unclear how they would set a precise 5 secs. and even less clear how they would enforce it. Screen's run was the longest — nearly 6 secs. and he won it.

This had given time for the Glider duo to recover and prepare. Once again Cooper was up and off first and although sinking all the way managed to hang on for 2:44. The air was rather chilly now and Fantham was still towing upwind. Presumably he had been informed of Cooper's time before he released and it was reasonable therefore that he should use all the period available as 2:44 must have seemed quite attainable. The lift however was not to reappear, and his flight made a few seconds before the end of the round dropped for little over two minutes. Cooper had triumphed this time in calm conditions in which he is not usually at his best.

The events of the three day Nationals had been allowed to run their course uninterrupted and the outcomes of all the sixteen events had been fair. Surely there can be little wrong with the existing SMAE Free Flight rules if they are seen to produce such acceptable results over a three-day event involving more than 800 entries.

**Chris Edge releases A/2 Glider for Arno Haken from Holland, no stranger to the British Nationals, who reached the fly-off with this model.**



**BRITISH NATIONALS 1983 — RESULTS**

**A1 GLIDER - 68 entered - 51 flew (2 in fly off)**

1. G. Beal	C M	10:00 - 2:57
2. J. Cooper	Biggles	10:00 - 0:00
3. R. Sheen	Nantwich	9:50
4. K. Smith	Crookham	9:45
5. P. Harris	MFFG	9:44

**COUPE D'HIVER - 71 entered - 48 flew (4 in fly off)**

1. J. Walker	Birmingham	10:00 - 1:24
2. I. Davitt	Leeds	10:00 - 1:20
3. G. Ferer	Leicester	10:00 - 1:03
4. G. Sharp	Croydon	10:00 - 0:07
5. M. Richardson	Eastbourne	9:58
6. S. Screen	Birmingham	9:55

**A POWER - 15 entered - 25 flew (2 in fly off)**

1. N. Marcus	Croydon	10:00 - 2:31
2. R. Peers	Falcons	10:00 - 1:58
3. M. Gilmore	Grantham	9:53
4. R. Moore	Biggles	9:46
5. T. Payne	Biggles	9:46

**HIG - 31 entered - 25 flew**

1. W. Simms	Crookham	1:56
2. D. Edmondson	C M	1:55
3. P. Ball	Grantham	1:42
4. M. Page	Peterborough	1:41
5. J. Hopper	Freshbird	1:31

**CO DURATION - 34 entered - 16 flew (4 in fly off)**

1. R. Cherry	E. Grinstead	10:00 - 1:50
2. S. Philpott	Biggles	10:00 - 3:02
3. P. Ball	Grantham	10:00 - 2:22
4. R. Staines	Grantham	10:00 - 0:21
5. B. Kenny	Vulcan	9:20

**OPEN GLIDER - 130 entered - 96 flew (27 in fly off)**

1. P. Owens	Liverpool	9:00 - 3:38
2. D. Staines	Grantham	9:00 - 3:16
3. J. Cooper	Biggles	9:00 - 3:11
4. G. Maddin	Crookham	9:00 - 2:58
5. E. Drew	B and W	9:00 - 2:53
6. M. Fantham	Richmond	9:00 - 2:53
7. A. Jack	Tynemouth	9:00 - 2:43
8. A. Cordes	Birmingham	9:00 - 2:39
9. J. Anderson	NYFFG	9:00 - 2:35
10. J. Carter	Falcons	9:00 - 2:33
11. J. Williams	Freshbird	9:00 - 2:33
12. D. Oldfield	Watton	9:00 - 2:28
13. P. Cameron	Crawley	9:00 - 2:20
14. J. Ashmole	Grantham	9:00 - 2:18
15. J. Bailey	Biggles	9:00 - 2:18
16. C. Hickmatt	NTFFG	9:00 - 2:17
17. J. Flynn	Liverpool	9:00 - 2:17
18. T. Fairgrieve	Grantham	9:00 - 2:11
19. P. Harris	MFFG	9:00 - 2:10
20. G. Pink	B and W	9:00 - 2:08
21. R. Bailey	St. Albans	9:00 - 2:07
22. M. Coomes	Grantham	9:00 - 2:01
23. J. Foster	MFFG	9:00 - 1:51
24. M. Duce	Liverpool	9:00 - 1:51
25. P. Putnam	Freshbird	9:00 - 1:44
26. D. Pepperell	St. Albans	9:00 - 1:35
27. W. Colledge	Birmingham	9:00 - 1:16

**OPEN RUBBER - 81 entered - 57 flew (33 in fly off)**

1. M. Howiek	E. Grinstead	9:00 - 8:35
2. P. Ball	Grantham	9:00 - 7:43
3. J. Bailey	Biggles	9:00 - 7:40
4. J. Carter	Falcons	9:00 - 7:24
5. T. Hargreaves	Leeds	9:00 - 7:04
6. I. Kaynes	Croydon	9:00 - 7:00
7. C. Strachan	Impington	9:00 - 6:48
8. J. O. Donnell	Whitefield	9:00 - 6:25
9. D. Neil	Anglia	9:00 - 6:19
10. M. Croome	Grantham	9:00 - 6:17
11. P. Davies	B and W	9:00 - 5:37
12. C. Blanch	Watton	9:00 - 5:36
13. M. Pressnell	St. Albans	9:00 - 5:24
14. D. Davitt	Leeds	9:00 - 5:20
15. N. Lee	E. Grinstead	9:00 - 5:10
16. N. Willis	Watton	9:00 - 5:04
17. P. Putnam	Freshbirds	9:00 - 5:03
18. T. Gray	St. Albans	9:00 - 4:53
19. R. Monks	Birmingham	9:00 - 4:28
20. B. Lavis	Biggles	9:00 - 3:58
21. M. Chilton	EPS	9:00 - 3:54
22. N. Marcus	Croydon	9:00 - 3:49
23. A. Brown	Tynemouth	9:00 - 3:42
24. E. Hawthorne	NYFFG	9:00 - 3:40
25. L. Auckland	Grantham	9:00 - 3:20
26. B. Horsley	Grantham	9:00 - 1:49
27. T. Dilks	Falcons	9:00 - 0:22
28. G. Beal	C M	9:00 - 0:07
29. R. Elliott	Croydon	9:00 - 0:05
30. F. Sharp	Croydon	9:00 - 0:00
31. D. Scrubby	C M	9:00 - 0:00
32. G. Klemke	Neumuster	9:00 - 0:00
33. B. Aslett	Swindon	9:00 - 0:00

**OPEN POWER - 83 entered - 39 flew (14 in fly off)**

1. Tom Smith	BAC	9:00 - 7:43
2. R. Cummins	B and W	9:00 - 7:42
3. T. Payne	Biggles	9:00 - 7:30
4. S. Screen	Birmingham	9:00 - 7:30
5. R. Monks	Birmingham	9:00 - 7:25
6. R. Staines	Grantham	9:00 - 7:24
7. J. Hopper	Freshbird	9:00 - 7:13
8. P. Harris	Birmingham	9:00 - 6:49
9. J. Smith	BAC	9:00 - 6:10
10. R. Peers	Falcons	9:00 - 5:56
11. R. Baggett	Birmingham	9:00 - 5:47
12. N. Marcus	Croydon	9:00 - 5:39
13. A. Smith	BAC	9:00 - 2:21
14. K. Faux	Freshbird	9:00 - 0:00

**VINTAGE - 32 entered - 35 flew**

1. P. Ball	Grantham	9:00
2. T. Dilks	Falcons	8:55
3. B. Harding	Darlington	8:54
4. M. Croome	Grantham	8:44
5. S. Philpott	Biggles	8:38

**TAILLESS - 7 entered - 7 flew**

1. J. Pool	NTFFG	9:00
2. I. Kaynes	Biggles	8:49
3. R. Peers	Falcons	8:47
4. K. Attiwell	Calderdale	7:43
5. S. Philpott	Biggles	2:59

**WOMEN'S CUP - 9 entered - 8 flew (2 in fly off)**

1. J. Nash	Watton	9:00 - 4:06
2. J. Joiner	Morley	9:00 - 1:53
3. B. Tyson	Crookham	8:58
4. R. Hubbard	Watton	8:52
5. S. Clavton	Grantham	8:08

**FROG JUNIOR - 18 entered - 14 flew (5 in fly off)**

1. J. MacDonald	Biggles	9:00 - 3:45
2. N. Dixon	Birmingham	9:00 - 3:22
3. R. Anderson	NYFFG	9:00 - 3:12
4. S. Dixon	Birmingham	9:00 - 3:03
5. A. S. Cordes	Birmingham	9:00 - 3:02

**CO SCRAMBLE - 10 entered - 8 flew (30 minute periods)**

1. I. Davitt	Leeds	15:56
2. A. Stages	MFFG	16:29
3. M. Coomes	Grantham	16:05
4. J. Tipper	Lac-Becs	12:07
5. I. Smith	RAFMAA	11:52

**A2 FIA - 94 entered - 78 flew (4 in fly off)**

1. J. Cooper	Biggles	21:00 - 1:00 - 2:44
2. M. Fantham	Richmond	21:00 - 1:00 - 2:09
3. B. Baines	RAFMAA	21:00 - 2:55
4. A. Hadden	Holland	21:00 - 2:10
5. S. Philpott	Biggles	20:49

**WAKEFIELD FIB - 54 entered - 41 flew (2 in fly off)**

F. Foster	RAFMAA	21:00 - 1:00
2. G. Sharp	Croydon	21:00 - 2:20
3. D. Coomes	B and W	20:55
4. I. Taylor	Falcons	20:52
5. R. Elliott	Croydon	20:52

**POWER FIC - 20 entered - 13 flew (4 in fly off)**

1. S. Screen	Birmingham	21:00 - 1:11
2. P. Harris	Birmingham	21:00 - 2:54
3. R. Monks	Birmingham	21:00 - 2:54
4. K. Faux	Freshbirds	21:00 - 0:00
5. F. Chilton	Crookham	20:00

**NATIONAL GLIDER CHAMPION**  
John Cooper, Biggles  
2nd in A1  
3rd in Open Glider  
1st in FIA Glider

**NATIONAL RUBBER CHAMPION**  
Ian Kaynes, Croydon  
7th Coupe d'Hiver  
6th Open Rubber  
9th FAI Wakefield

**NATIONAL POWER CHAMPION**  
Stafford Screen, Birmingham  
8th in A power  
3rd in Open Power  
1st in FAI Power

**Junior National Champion for the Heather Trophy**  
1st N. Dixon, Birmingham ..... 6 pts  
2nd A. Tennant, Timperley ..... 6 pts  
3rd G. Neil, Anglia ..... 4 pts  
3rd D. Donnerlevy, Hamilton ..... 1 pts





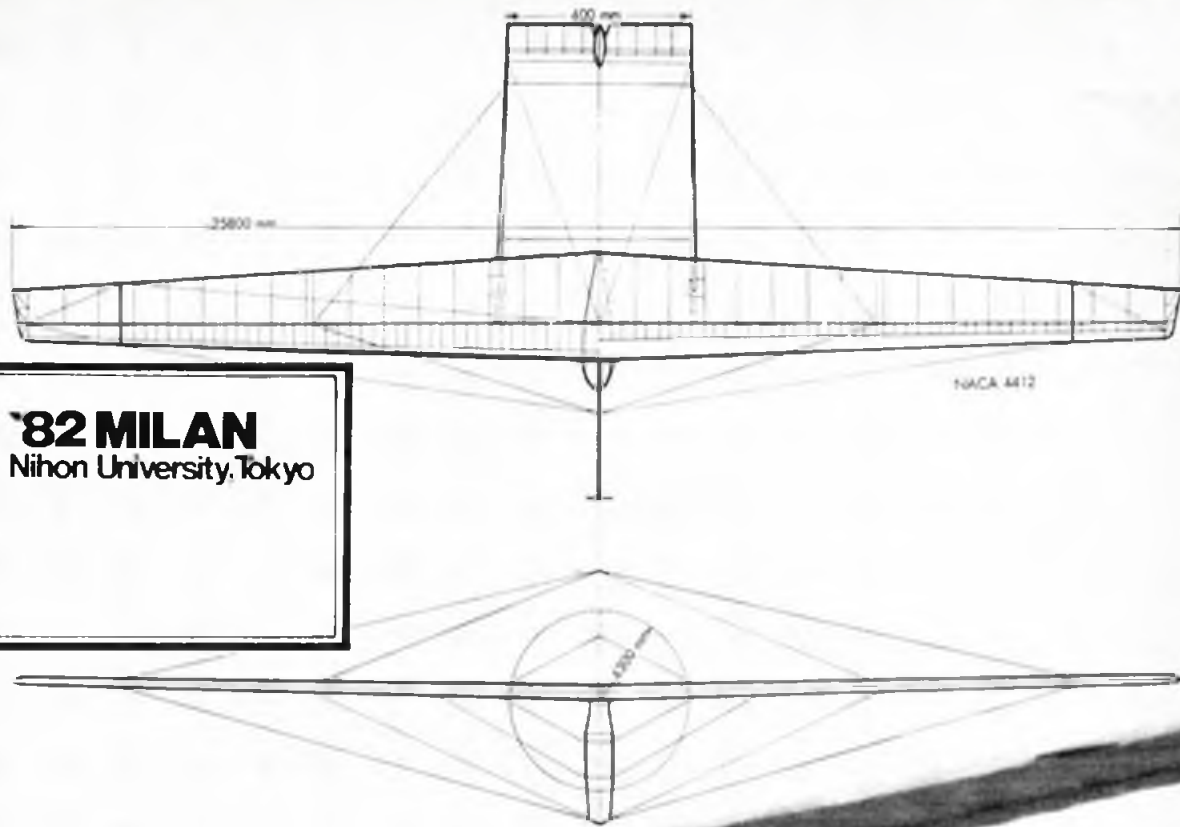
# New Manpowered Aircraft Speed Competition

*Ron Moulton describes the latest developments in this fascinating field using "stored energy" power source to assist the pilot.*

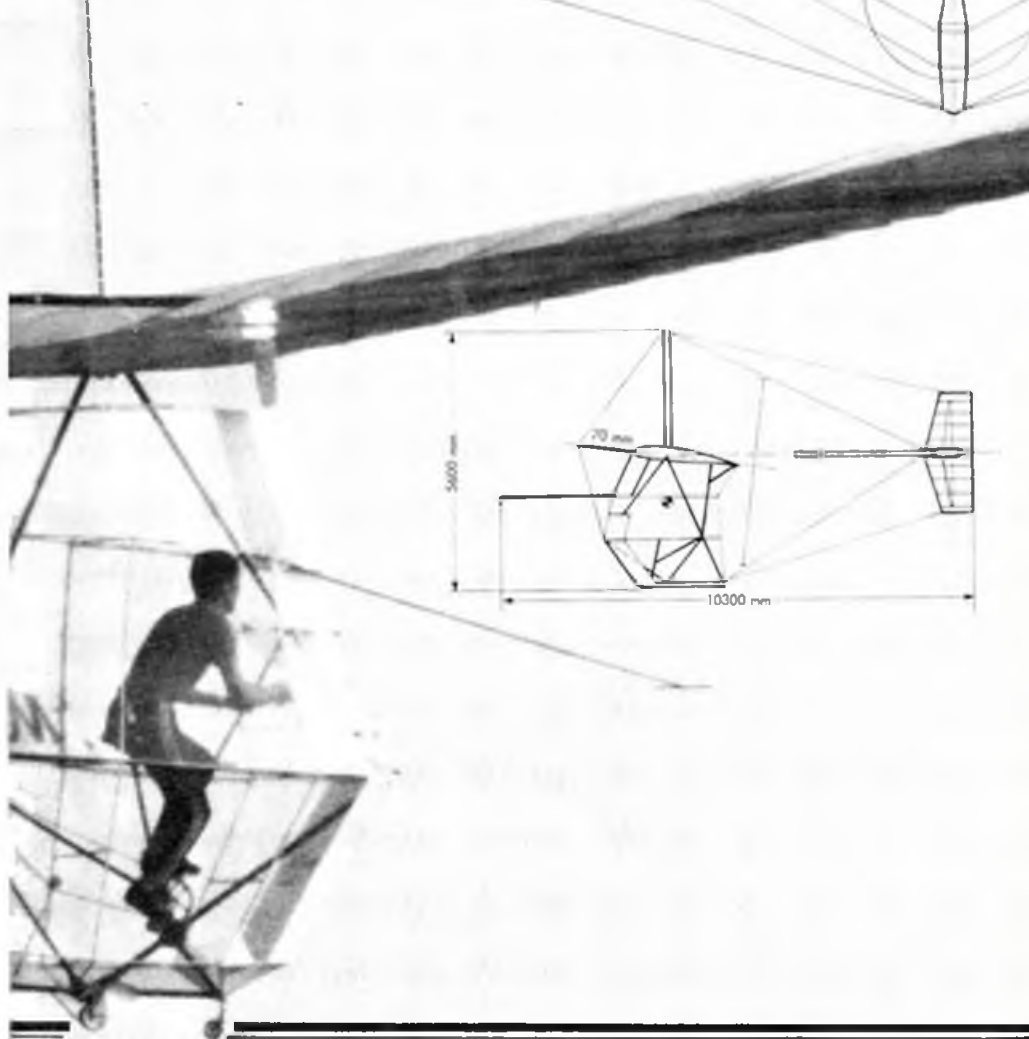
*Flying majestically at a mere 12 mph the latest Japanese manpowered aircraft, MILAN 82 weighs a mere 198lbs complete with its student pilot at Nihon University, Tokyo. The externally braced M.P.A. has obvious influence from the successful Gossamer Albatross but utilises more conventional control surfaces on a trailing tailplane, supported by carbon fibre booms. Lateral control is through wing warping. The plastic roller chaindrive system has been simplified to a great extent when compared with earlier Japanese projects and the propeller at 4.2m diameter is the largest yet fitted to any of the dozen machines produced by the Nihon University.*

STORED ENERGY IS PERMITTED . . .





**'82 MILAN**  
Nihon University, Tokyo



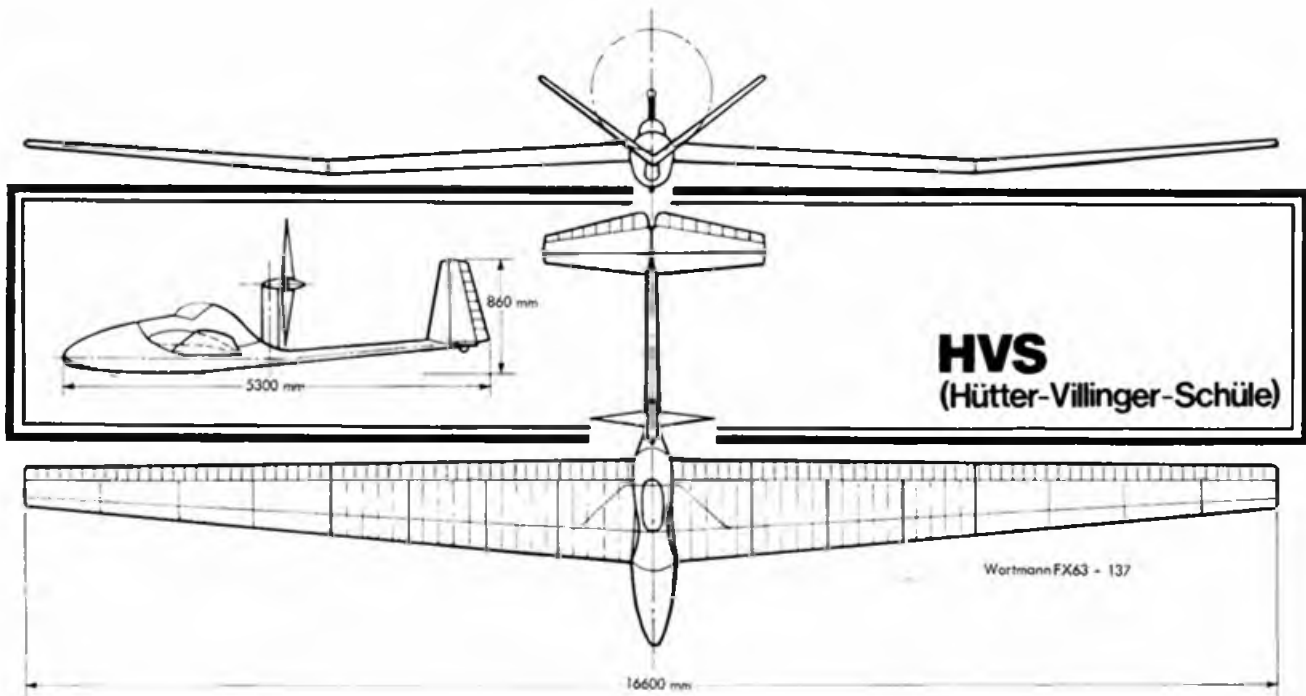
**H**ENRY KREMER, the generous benefactor of manpowered aircraft development has yet again provided a substantial cash prize for a new competition. In handing over his personal cheque for £100,000 to Captain E. M. Brown, President of the Royal Aeronautical Society on April 26, Henry Kremer has yet again provided inspiration which we are sure will lead to some spectacular achievements.

The first figure of eight flight by the Gossamer Condor, and the Channel Crossing by Gossamer Albatross in June 1979 have already won £150,000 for Paul MacCready. Additional prizes still await to be claimed for the first non-USA achievement of a figure eight flight, a slalom course flight, and one exceeding three minutes duration. The major challenge will now undoubtedly be for the new Kremer Speed Competition.

Regulations now available from the RAeS reveal changing attitudes which will encourage more participation. The £100,000 is to be divided so that the first winner alone, receives £20,000, and subsequent increments of £5,000 each are to be awarded to competitors improving the record time. So no longer will there be a case of the first to win, taking all the kudos. Additionally, the rules permit installation of stored energy. At the manpowered aircraft symposium May 4, an excellent paper by Keith Sherwin revealed that electrical energy (among others he described), could provide assistance for the three minute period which a speed flight is expected to take. The course is to be triangular, with three turning points and a perimeter of 1,500 metres which allowing for turns and wide radii, gives a nominal flight distance of one mile. The first record







claim must be of less than three minutes from start to finish around the triangular course giving a nominal speed of around 20mph. This figure has already been achieved by several of the 58 MPA's made so far (of which at least 38 have successfully flown).

The challenge is international, but requires supervision by the National Aero Club and FAI observers. Miniature engines, solar power and other devices are not permitted, nor can there be any remote control or external assistance but the parameters are wide enough for an enthusiast to develop entirely new machines. The latest in the long line of Japanese man powered aircraft is the **Milan 82**, an ultra-lightweight which has a wing loading of only 7oz/sq.ft. when

empty. Already, the **Milan 82** has made one flight of 2.6km and is currently being groomed for an attempt on the international figure of eight course by the students of Nihon University. It is the twelfth in a series of MPA's made by the students under the guidance of Prof. Hidemasa Kimura.

Another equally fascinating design has made initial flights in Germany, and turns the wheel full circle after 50 years of experiment. Franz Villinger was involved in the original **Mulfi** design back in 1933. Now, at 75 years, he has returned with Wolfgang Hutter, designer of the famous primary gliders and Wilhelm Schule, an airframe constructor, to make the **HVS** which has already flown from Leipzig in Bavaria. Carbon fibre and expanded polystyrene are

used extensively. The Rohacell foam fuselage is particularly streamlined and incorporates unique drive mechanism which calls for backwards and forwards pedal strokes rather than the traditional cycling motion. A Kevlar variable pitch airscrew is mounted on a pylon behind the main fuselage pod, rotating at the higher than normal speed of 400rpm. Using the Wortmann FX63-137 section (also used on some of the earlier Japanese aircraft, **Ibis** and **Stork**) the wing has anhedral centre panels which incorporate small wheels at the dihedral break so the aircraft has good ground control with minimum drag. Designed to fly at a cruising speed of 21mph the HVS appears to be a specially suitable candidate for the Speed prize. Meanwhile in the UK, a new inflatable machine is being made by Fred To and his earlier, gigantic 102ft. span, 16ft. chord **Phoenix** has been reduced in thickness to be more manageable. It is expected to make test flights soon. News of other manpowered exponents is anxiously awaited...

*Completely different in every regard to other manpowered aircraft experiments, the German HVS has been in consideration for several years, initially for the Cross Channel Challenge and latterly for the International Figure 8 competition. It now seems admirably suitable for the new speed event. Supported by the Aircraft Industry in Germany, the HVS is extremely clean and should thus be fast. Initial flights indicate a cruise at 21 mph. The drive mechanism is complex, being actuated by push pull operation, runs via cables to the pylon where there are chains to contra rotating flywheels on the prop shaft. Flying weight is 242 lbs and as will be clear from these photographs, a smooth runway is essential for running tests. The small dimensions make it admirably suitable for flight in breezy conditions, it has been designed to fly in wind velocities of up to 30ft. per second and actual tests have been conducted in conditions of faster wind speeds. To date, the longest flight is 2,300ft. Pilot Oskar Staudenmaier is 23 years old, an experienced sailplane and light aircraft pilot now in training for serious attempts to be made later this year.*





# How to make a start in Control Line COMBAT

by Brian Waterland and Mark Jarrett

## Part II

**A**S YOU MAY remember, in July issue we covered the basic flying abilities a combat flyer needs, the choice of a model and equipment, how to set up your model for best flying, and the rules to British Diesel Combat.

This month we cover the "5th Revolution" design which we assume will be your first model and help you through your first real competition. We are writing for the beginner who is afraid of entering his first competition, so please bear with us if what we say is obvious to you.

### Pre-competition preparation

Try and build yourself at least one spare model. Test fly it and ensure it flies as well as your first one. As you will have realised, since only one aeroplane is allowed per bout, you only need one motor. This can be swapped from model to model between bouts. Make up a spare set of lines and cut and *balance* a couple of spare propellers.

A few days before the competition, contact the organiser to check if it is still on and how to get to the flying site. Sort out the equipment you intend taking to the competition and preferably make a check list so you don't leave anything vital behind. As a result of your sport flying you will already have accumulated a kit of useful items to carry with you, e.g. pliers, screwdrivers, tin of nuts, bolts and pins, fuel tubing, nut runner, chicken finger. For a competition you will need slightly more equipment. You cannot go home to repair your model, so ideally you should carry a tube of super glue and or some 5-minute epoxy. It is pretty well impossible to repair plastic film covering on the field (perhaps someone will invent a 12-volt heatshrink gun!) so some clingfilm to wrap around the wing and some plastic sticky tape to hold it on is useful. Sometimes a broken Trailing Edge can be repaired by splinting it with hard balsa and a Leading Edge repaired with a 1/4 in. ply brace, so take a little spare wood.

If you are unfortunate enough to suffer from leaking fuel tanks, then a 12-volt

soldering iron would be an asset.

You should also take some sticky plasters in case you, rather than your model, get damaged.

British weather being what it is, wrap up warm, since flying sites by definition are usually exposed and take waterproofs, wellingtons and a large polythene bag to keep your kit dry. Don't forget money for your entry fee and some food!

### The day of the competition

Try and arrive at the competition site early. The inexperienced flyer who turns up late in a flap has invariably left something behind and rarely succeeds.

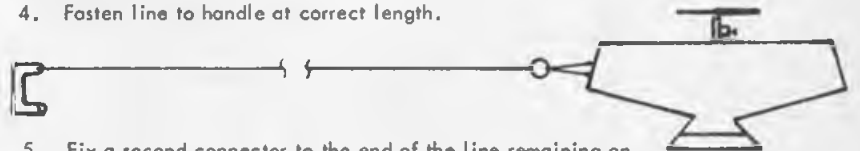
Check with the organiser if and where you can have a test flight and make sure your aeroplane will empty the tank and fly through the manoeuvres without hiccuping.

Incidentally, don't be deterred if you have not got your own pitcrew with you. Combat fliers are a very friendly bunch and if you tell the organiser your problem, then it is most unlikely you'll be lacking a volunteer pit crew when your bout is called.

Check your lines for length on the official line check. If there is a discrepancy you will still have time to correct it. Remember to take any twists out of your lines and never fly with them kinked; they will break at the first sudden strain (usually in a line tangle

**Fig. 1a**  
Making up lines on the field to ensure that both are the same length.

1. Fix a connector to the loose end on the reel of stranded lines.
2. Clip connector through BOTH model leadouts (this holds the elevator at neutral).
3. Put model on line check and run out line for approximately 12" beyond handle marker and cut.
4. Fasten line to handle at correct length.



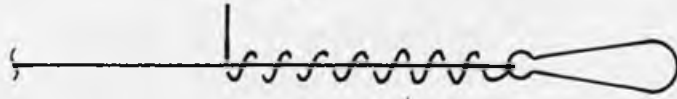
5. Fix a second connector to the end of the line remaining on the reel.
6. Clip this connector through BOTH leadouts as well.
7. Run out second line and pass through handle/connector. Pull line through handle until it is vertical when pivoted on a finger placed midway between the lines and fasten at this position.



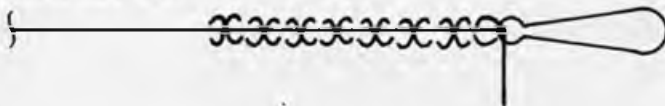


**Fig. 1b**  
To make a line end connection on the field.

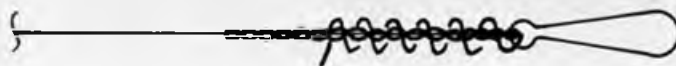
1. Slip a piece of sleeving on to the Laystrate line.
2. Push approximately 12" of wire through the swivel and bind line back on itself for approximately 1½".



3. Bind back to the swivel.



4. Pass line back through swivel and continue binding closely together away from swivel for approximately 1".



5. Cut off excess line and slip sleeving back over binding and swivel.



or crash). Fig. 1 shows how to make up a set of lines on the field.

By now you will have paid your entrance fee. As soon as the draw is announced, find out who your opponent in the first round will be and try and watch him practising. What are his abilities? Is he an experienced pilot or a rookie? How tight does his model loop or hunt? Is his model strong or flimsy? How fast is it?

While you are waiting for the start, run out a spare set of lines and ensure your pit man has at least the following kit with him:

Spare Propeller	Screwdriver
Spanner for prop. nut	Fuel Bottle
Fuel Tubing	Rag
Side cutters or knife	Pliers

It is amazing the number of people who lose combat bouts unnecessarily. You can be one cut in front of your opponent, but lose if you spend two minutes longer on the ground. So be prepared and make sure you aren't the chap running around during the bout looking for a spanner to change the propeller or for a new piece of fuel tubing.

With all your preparations complete, sit and wait for your bout to come up.

## The Bout

When your bout is called, get in the circle quickly. This earns the gratitude of the organiser but, more important, you'll be able

to choose your take-off point. You want to take off pointing downwind, but ensure there is a reasonable separation between the models to avoid getting too close to your opponent's pit crew. (See fig. 2).

Make sure you have a streamer and that it is well tied on. Most people tie it to the engine compression screw. If the streamer comes off or fails to unfurl correctly you will have to land and put on another (usually supplied by the centre marshal).

There is a one-minute engine warm-up period, which means you should have a tank

capable of giving an engine run of five minutes. Otherwise, you will have to refuel during the warm-up period or, worse, during the bout. Make sure your engine is really warmed up. If need be, you can help it warm up quickly by putting your fingers in front of the cylinder head, thus preventing cooling air going over it (but be careful not to get your fingers in the propeller).

At 30 seconds to go (usually announced by the centre marshal), get into the centre of the circle, wipe your hands, fix your wrist strap, greet your opponent and **STAY CALM!**

5, 4, 3, 2, 1... you are away. Fly straight and level but get some height. When there is sufficient separation between your model and your opponent's, the centre marshal will signal the start of combat.

## Offensive flying

With any luck your model will be higher than your opponent's. Dive towards his streamer and try and get that first cut and get up and away. Remember, that to get a cut, the 8" or so of your propeller has got to go through his streamer.

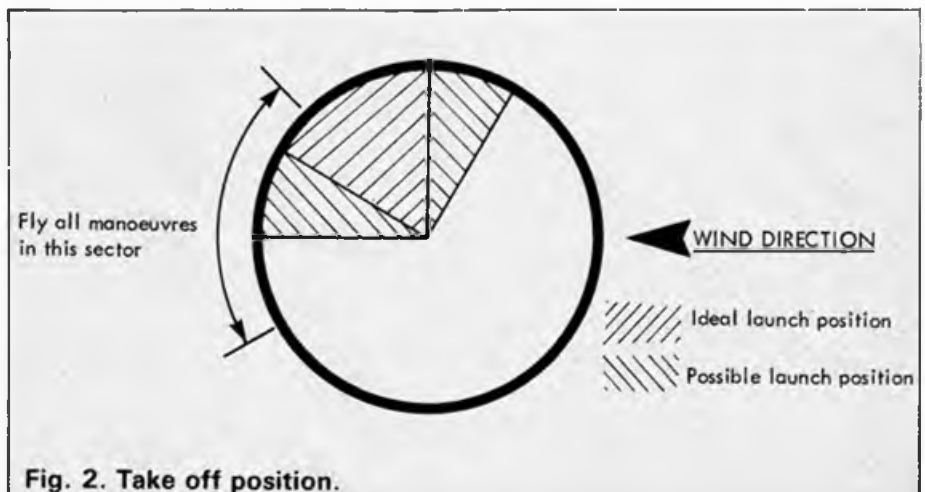
This cannot happen if your handle isn't approximately level with that of your opponent's. In fact, streamers sometimes hang out of the circle a little, which means your handle must be slightly in front of his (or hers).

In order to get away, your opponent may loop; in that case you loop too and stay with him. If you break away he will get on your tail. The most popular evasive manoeuvre is a horizontal eight (Fig. 3) but don't get locked into doing a number in the same place, your opponent will anticipate your next move and catch you.

Try and do all your manoeuvres across the downwind leg. Upwind flying will probably lead to slack lines and sorely test your flying skills. Your opponent may try to run away from you (literally) by running around the circumference of the centre circle, thus increasing the flying circle radius. This puts his model (and streamer) outside yours, making it virtually impossible for you to get a cut. Running away like this is very tiring however and he may stop after a short time. If he doesn't, try standing in his path.

## Defensive flying

Should your opponent get on your tail, then this is where your earlier observations come in handy. If you think your model bunts tighter than his, then bunt and, with any luck, he will hit the ground and you won't. (Fig. 3). If his model was flimsy, then he may be unable to go up again and you will have won the bout!



**Fig. 2. Take off position.**

**Control Line Combat is one of the most entertaining model flying activities of all, guaranteed to draw a crowd of enthusiastic spectators. Release of modal and re-launch during a combat bout is always hazardous to a degree and hard hats are always required equipment.**

Supposing you do not have the confidence to do the bunt; make him think you are going to do one and then change your mind. Sell him the dummy (see Fig. 3).

You might try running away in level forward flight but, if your flying ability is up to it, try bunting or doing a reverse wing over and flying a low inverted lap. This makes it doubly difficult for your opponent. Trying to attack with reversed controls is difficult.

Sooner or later you are going to get into a line tangle. DON'T PANIC. All the controls will still function. An experienced opponent may talk you out of the tangle (he doesn't want to hit the ground any more than you do). Basically, you fly out of it by doing the reverse of what got you into it (if you can remember that far back!). Don't try going into level flight and leave your opponent; one of you will crash and most likely it will be you, since he will still be downwind with tight lines and you will be flying across the upwind leg with binding, slack lines.

If your model hits the ground in a line tangle remember not to pull at the lines, since this will almost certainly cause your opponent to crash and lead to your disqualification. Instead, try and gently unwind the handle over your opponent's lines while he flies consecutive manoeuvres (generally figure eights) in one place. The centre marshal will undoubtedly assist you in sorting out the problem.

Once untangled it is up to your pit crew to get you back in the air quickly. Should you have to leave the centre circle to assist, then tell the centre marshal your intentions and remember you have to don a safety hat. Your opponent should fly straight and level whenever you are on the ground.

Should you have crashed on the upwind portion of the circle then, if there is anything more than a light breeze, don't try and launch there. You will probably get slack lines on take-off and crash. Instead, play safe and get your pit crew to carry the model round to launch in a down or crosswind position (Fig. 2).

When you are airborne again, remember to fly straight and level until the centre marshal signals the restart of combat.

### After the bout

After what seems either the quickest or the slowest four minutes ever, depending on whether you are winning or losing, the centre marshal will signal the end of the bout. Don't leave the circle until your opponent has landed; then clear the circle quickly to allow the next bout to proceed. Collect your safety hat and pit crew kit (including the squeeze bottle!). Then check the score in your bout at contest control. If it is closer than 10 points you will have to re-fly.

If you have won, then well done! As you progress through the rounds the quality of your opponents will improve. This isn't so bad, many people fly better against better opponents and you will be learning all the time.

If you have lost then it isn't the end of the world. You have taken your first important step in competition flying.

While the bout is fresh in your mind try



and analyse why you lost. Was it because of shortcomings in:

1. Pilot skill?      3. The engine?
2. The model?      4. The pit crew?

The first will improve rapidly with experience and with observing others. How do they attack and defend? What tactics do they use?

As for the second, if you are flying a good modern design used successfully by a number of other flyers, it is unlikely that the model is seriously at fault. Resist the temptation to try and design your own world-beater, it is unlikely to equal a proven design, but that doesn't mean you shouldn't make minor modifications to your model: move the centre of gravity, change the elevator area, increase the span of the model, or try increasing the tail moment (that is increasing the root chord).

Your engine should be the best you can afford, but most important it must be a good starter.

And, lastly, your pit crew will improve with practice. Hopefully they will get over the stage where, in the heat of the bout, they launch the model at you, stand on the

streamer and lose the squeeze bottle!

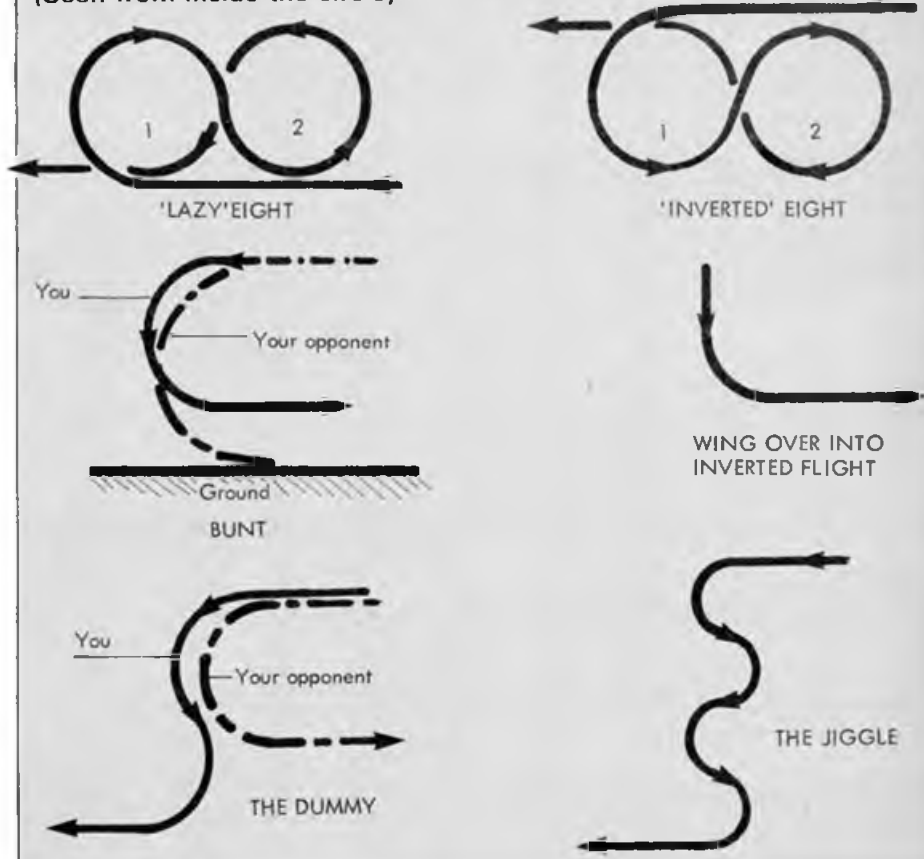
Once you have completed your first competition, whether you won or lost, you will probably be very keen to have another go. Remember combat flying at any level, world championship or club, is all about practice, consistency and knowing your model. The best way of achieving this is to enter competitions. There is no shortage of Diesel Combat competition in the U.K. Peterborough M.F.C. run four events per year and other clubs, including Wharfedale and Wolves, run meetings to the same rules. It is hoped that in 1983 the Area Centralised meetings and the British National Championships will also feature Class 'A' Diesel Combat.

We hope these articles have been of use and encouraged you to take your first steps in competitive flying (and perhaps some older fliers to return to the sport).

We look forward to meeting you in the circle. Remember, when you have just "tent-pegged" your model, that combat flying is character building!

M.J.  
B.V.W.

**Fig. 3. Evasive manoeuvres.  
(Seen from inside the circle).**





**T**HE REVOLUTION series of combat wings was initially conceived in 1976 and progressively developed to give a rugged and very manoeuvrable model. The continual refinements have resulted in a model which is very competitive and well up to the standard required today.

5th Revolution has been built by pilots of all abilities and, with nylon covering and a forward centre of gravity, can be used as a control line trainer. However, with a light model and a rearward centre of gravity the design will compete with any other at least on equal terms — only pilot ability is the limiting factor.

Commence building by cutting out the trailing edge from  $\frac{1}{8}$  in. sheet balsa and gluing a  $\frac{1}{8}$  in. sq. strip of spruce to the front (straight) edge. Unless stated otherwise, the glue used throughout construction is PVA (white) woodglue.

The centre rib sides are cut from  $\frac{1}{8}$  in. sheet balsa and the core from  $\frac{1}{8}$  in. plywood. Glue the assembly together as a sandwich, weight down and leave to dry.

I taper the leading edge after building the wing; if you taper it before assembly, then you will need a  $\frac{1}{8}$  in. packer under each tip when you pin it down.

While the wing is drying, cut out and assemble the engine pod using epoxy resin.

When the wing is dry remove from the plan and sand and shape all over.

Next cut out and fit the bellcrank mount using epoxy resin.

The plan shows two different bellcrank systems. The inverted bellcrank and the conventional method. The inverted bellcrank is claimed to improve the line tension in tight manoeuvres.

Advocates of the conventional bellcrank system claim it is slightly easier to install and has a straighter push rod which is less likely to bend in flight causing widening of manoeuvres.

All I can recommend is to try them and to see if you can tell the difference. If in doubt though, go for a conventional system.

PVA the tip gussets in position and drill the tips for the brass lead out tubes, when



by  
**NEIL GILL**

# 5TH REVOLUTION

Control Line Combat Design  
for 3.5cc diesel or  
glow motors

FULL SIZE PLAN FEATURE

Next cut out the  $\frac{1}{8}$  in. ply leading edge reinforcement and glue it to the rear of the leading edge as indicated on the plan.

The ribs are made from  $\frac{1}{8}$  in. and  $\frac{1}{4}$  in. sheet balsa, six from the  $\frac{1}{8}$  in. thick and two from the  $\frac{1}{4}$  in. thick. You will also have to cut the tips and the trailing edge extension from  $\frac{1}{8}$  in. sheet.

It is a good idea to write 'Top' on the trailing edge. The inboard wing is longer than the outboard and building the model upside down, i.e. longer outboard wing, will result in serious line tension problems!

## Assembly

The model is built flat on a board (preferably one into which you can stick pins). Cover the plan with thin polythene, to prevent glue sticking to it and pin the leading edge down. Glue the centre rib to the trailing edge and add the trailing edge extension pieces. Now stick the centre rib to the leading edge and pin down the trailing edge onto some  $\frac{1}{8}$  in. thick packers. These packers may be laminated from scrap sheet balsa and ensure that the trailing edge is on the centre line of the leading edge.

Add the ribs and tips and leave to dry. A tapered leading edge is shown on the plan, however, a parallel lin. commercial pre-shaped item can be substituted. The tapered leading edge gives a model which is faster on the level. However, using the commercial leading edge does not affect the model's turning ability.

Top right designer Neil Gill with one of many 5th Revolution combatic models, this one Solarfilm covered. Right: another 5th Revolution, this one by Brian Waterland, seen with Shadow 8. A Combat model.

this is done epoxy the tubes in position. Fit the bellcrank and bicycle spoke pushrod (remembering to solder the post bolt retaining nut).

Fit, bind and solder the seven strand Laystrate leadouts and make up and fit the mustard tin tank as shown on the plan. The leadout wires are threaded through holes drilled in the ribs from the bellcrank to the leadout tubes. Cut and fit the  $\frac{1}{8}$  in. ply pushrod outlet to the centre rib, and assembly is complete.

The model can be covered in *Solarfilm* or nylon, or one of the new heat shrink fabrics like *Solartex*. The last two being preferred for beginners, because of the added crash resistance. However, in all cases great care should be taken to prevent warping of the model during covering.

It is most important that the covering is removed from the centre rib where the pod fits so that a good glue joint is made. Sand the pod to shape and then epoxy in position.

Cut out, cover and fit the elevator either by using tape hinges or sewing, but make sure

that there is no slop in the joint.

Fit the elevator horn and set up for about 40° up and down movement (i.e. 80° in total). Fit a pushrod keeper to the end of the pushrod to prevent it falling out of the horn. I use a cut down electrical terminal as a pushrod keeper.

Temporarily fix the motor (complete with propeller) to the pod with a rubber band and adjust its position until the model balances level when suspended from the point shown on the plan. Now drill the four motor mounting holes.

The model can now be fuel-proofed. If it is covered with *Solarfilm* you will only need to fuel-proof the pod and outboard wing seams; but on a nylon model the whole thing will need doping and fuel-proofing to prevent fuel soaking into the covering. When absolutely dry fit the motor using 6BA bolts.

Final adjustment of the centre of gravity position and the elevator movement should be carried out to suit the personal preferences of the pilot for stability and manoeuvrability.



# AIRCRAFT DESCRIBED

NO:255

Drawn by Ian Stair  
Described by Charles W. Cain

**H**APPY BIRTHDAY, mein Herr Stösser! May all of us look as clean-cut and attractive when reaching our own 'Five-O' as does Kurt Tank's spritely, fully-aerobatic, single-seat advanced trainer, the Fw 56 A-1 Stösser (Hawk). As the Fw 56a (later Fw 56 V1 — Versuchs or Experimental No. 1), the then very sporty-looking first prototype took to the air from Bremen Flughafen (Airport) in November 1933. And thereafter, between 900-1,000 examples were built for the Luftwaffe and the para-military Nazi Fliegerkorps (NSFK). Unlike other contemporary German trainers, no Stösser is known to have survived into the 1980s. Exports were limited to mere handfuls and to such countries as Austria (before absorption into the Greater German Reich in March 1938), Bolivia, Bulgaria and Hungary. At least one Fw 56 A-1 in Dutch military markings was photographed at the Twenthe air base in the mid-1940s.

The 1930s provided designers and engineers with a wealth of new ideas and philosophies as well as new materials and increasing demands for answers to 'higher, faster, further' specifications. And Germany was not slow in pursuing the ideal of a comparatively cheaply-constructed leichter Jagdeinsitzer or light fighter suitable for the Heimatschutzjäger role of Home Defence Fighter for auxiliary interception units. At the same time, the successful contender's three prototypes — competitors in the 1935 evaluation trials included the Arado Ar 76, the Heinkel He 74 and the Henschel Hs 125 — also had to be readily adaptable to the role of Übungsflugzeug or practice aircraft. After several design changes including a new undercarriage design, bigger wheels, the discarding of wheel spats, additional bracing wires, exhaust stubs, a different propeller and, most obvious, the deletion of the headrest 'hump' in the top decking behind the cockpit, the series Fw 56A became the Stösser (Hawk).

## Prototypes and production

By the summer of 1935, the Fw 56 was the trials' victor over its nearest rivals, the Ar 76 and He 74 but less on performance than superior robustness in the field. Although the priority of the emergency light fighter role had now lessened, the need for the Stösser as a 'practice aircraft' for student



# Focke Wulf FW56 STÖSSER

fighter-pilots assured its long production run with deliveries from 1937 onwards.

**Fw 56 V1** (ex-Fw 56a; D-1SOT) corrected to D-1SOT'. With earliest series 240hp Argus As 10C (Srs. I) and two-blade metal propeller. Colourings and markings: All-silver, black civil registration letters. National flag (swastika) on rudder. Fatal crash in Berlin, killing test pilot.

**Fw 56 V2** (ex-Fw 56b; D-11KA): Offered with second-option metal-structure mainplane; not proceeded with. Second variant of spatted main undercarriage. Headrest 'hump' removed; revised motor cowling, new exhaust stubs; and Heine wooden propeller. C&M: As V1. NB: in limited dive-bombing experiments with 1kg (2.2lb) smoke bombs. Required use of vane-operated Argus controllable-pitch, two-

blade metal propeller (later seen on Fw 189 Eule Owl, etc.). Not proceeded with.

**Fw 56 V3** (D-11AR): With V2 improvements but reverting to standard wooden mainplane. First use of Fw-devised main undercarriage with trousered legs. C&M: As V1.

**Fw 56 V4** (D-11AU): to become Fw 56 A-01, pre-production No. 1): With 2 X MG 17 machine-guns in motor cowling in conform to auxiliary light fighter specification. Also vertical bomb stowage (3 X 10kg/22lb stores) provided aft of first fuselage frame. Not proceeded with. C&M: As V1.

**Fw 56 V5** (D-1GEU); Fw 56 A-02): As Fw 56 V4; weapons trials. C&M: As V1.

**Fw 56 V6** (D-1XYO; Fw 56 A-03): Reduction to 1 X MG 17 in starboard trough to meet production specification for Anton-series'

*Sheer elegance of the Stösser remains unmatched among parasol wing aircraft.*

*'KNI was the demonstrator sent to the USA where Achgelis flew it at many prominent meetings including the Cleveland Air races. It had a 270hp Argus and other non standard features which gave it a fully aerobatic performance.*

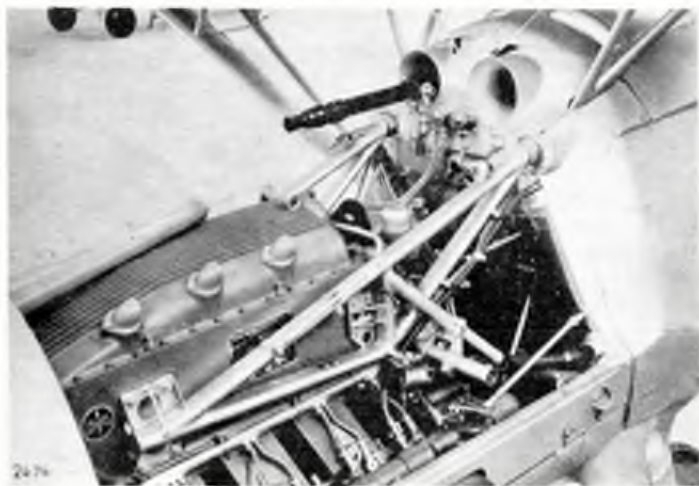


August 1983

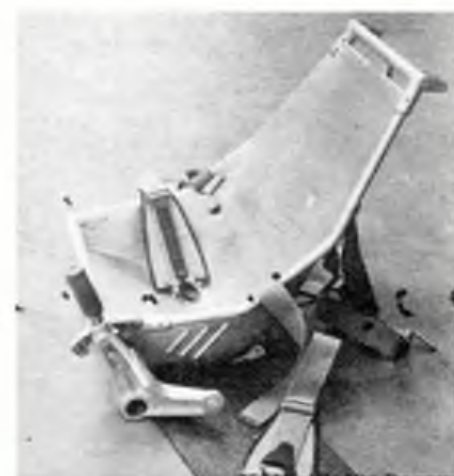




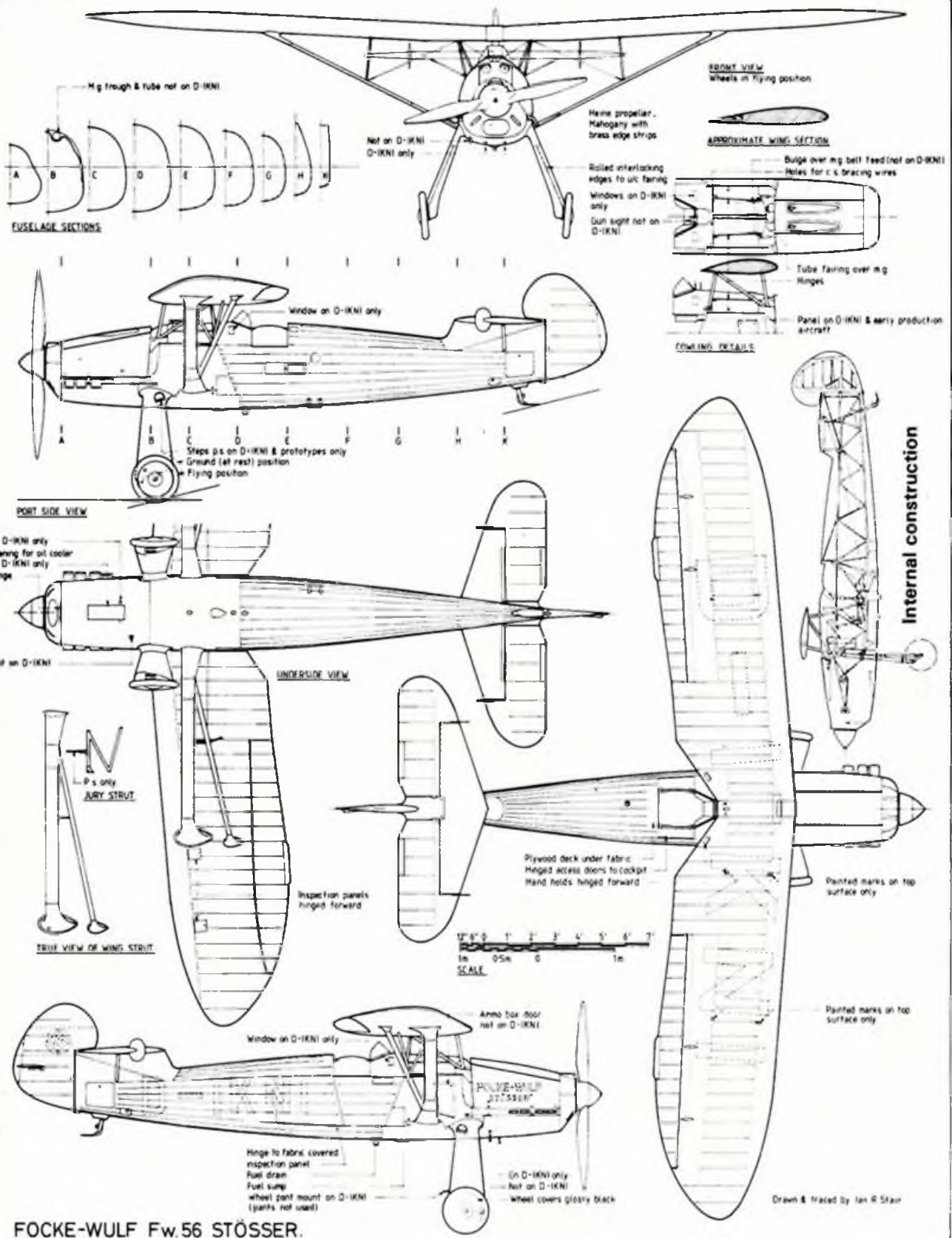
*Cockpits in the thirties weren't neat, lined or designed for comfort. The Stösser carried the impression of being a fighter, with spade control column, cast heel plates and a Revi sight in the windshield. Centre: the Heine fixed pitch prop and elegant cowling were particular Stösser characteristics. Above: starter handle in position, and filler cap removed in this rear cowl angle which also shows the neat strut fairing for the u/c. Below left: inside the cowl was no less neat. Engine bearers, gun faired crankcase and tidy installation are typically precise. Below: the sleek fuselage, gun troughs, and clean cabane strutting.*



*Tailplane forward of the large rudder was a design 'signature' adapted from Albatros. The endplates appeared in subsequent Fw designs. Above: the small divebrake on the centre section, shown open. Right: cockpit side flap for access carried instruction panels on the inside and on 'KNI', the Gilmore Lion sponsorship trademark was outside. Below: the shaped military style seat and height control arm, close up of wing strut fairings, undercarriage oleo and torque links without the trousers shroud.*







FOCKE-WULF Fw.56 STÖSSER.

**Fw 56 Stösser (Hawk): Design data**

**Manufacturer:** Focke-Wulf Flugzeugbau A. G. (GmbH) from 1936-45), Bremen Flughafen, Bremen, Germany.  
**Category:** single-seat, fully-aerobatic, military advanced trainer for student fighter pilots.  
**Powerplant:** one Argus As 10 C Series III air-cooled, eight cylinder, inverted-Vee inline delivering a maximum 240hp for take-off at 2,000 rev/min. Propeller: right-hand turning, fixed-pitch, two-blade mahogany propeller supplied by Heine.  
**Dimensions:** span 10.55m (34ft. 7 1/2 in.); length 7.65m (25ft. 1 in.); height 2.55m (8ft. 4 1/2 in.); wing area 14.0sq.m (130.7sq.ft.).

**Weights:** empty 670kg (1,475lb); loaded 985kg (2,170lb).  
**Loading:** max. power 4.10kg/hp (9.05lb/hp); max. wing 70.35kg/sq.m (14,401lb/sq.ft.).  
**Military load:** one or two fixed, forward-firing, 7.92mm (0.312in.) Rheinmetall-Borsig 1934 machine-guns with 250 rounds per gun. Three 10kg (22lb) bombs could also be accommodated as part of the military load.  
**Performance:** max. speed 278km/hr (172mph) at sea-level, max. diving speed 480km/hr (298mph); cruising speed 255km/hr (158mph); initial climb rate 504m/min. (1,655ft./min.); service ceiling 6,200m (20,350ft.); range 385km (240 miles) or 1.5 hours duration with fuel capacity of 100l (22 Imp. gal.); oil capacity 14l (3 Imp. gal.); landing speed 90km/hr (56mph); take-off run 168m (550ft.); landing run 233m (765ft.).

*A reprint of this four page feature, together with 1/24th scale dye-line print of Ian Stair's drawing is available from Aeromodeller Plans Service, P. O. Box 35, Wolsey House, Wolsey Road, Hemel Hempstead, Herts. HP2 4SS, price £1.50 + 45p postage & packing. Please quote plan No. 2869 when ordering.*

Übungsflugzeug or 'practice aircraft' role. Also weapons trials aircraft. C&M: As V1. Fw 56 A-1 (D-IKNI Achgelis one-off): for the famous display pilot, Gerd Achgelis, a non-standard production 'Anton' was fitted with a 270hp Argus As 10E and flew in the USA under the patronage of the Gilmore Oil Company. Unfortunately the only photographs of D-IKNI in the USA to hand show it with standard Heine wooden propeller whereas the more powerful As 10E was fitted with one of the vane-operated Argus two-blade metal propellers, according to German sources.

**Fw 56 miscellaneous:** apart from use in training schools, the Stösser was employed in other roles. As a glider-tug, there is photographic evidence of an Fw 56 A towing a Horten Ho IV glider. More exotically, a Luftwaffe Fw 56 A-1 (coded CA + GN) served as the 'parent' in a series of Hucklepack-flugzeuge (Pick-a-back Aircraft) trials with a DFS 230 B (coded CB + ZB) assault glider in 1942-43.

### Construction details

**Design team:** as a recently appointed Technical Director, Dipl. Ing. Kurt W. Tank was in overall charge; his deputy for the Fw 56 project was Oberingenieur Rudolf ('Rudi') Blaser who supervised the detail design undertaken in the Focke-Wulf Konstruktionsbüro or Design Office.

**Mainplane:** the parasol monoplane configuration was achieved by employing splayed-out N-struts attached to the upper fuselage longerons and generous Vee-struts anchored to the lower fuselage longerons. A 3° sweepback was incorporated in the plan-form (aspect ratio of 6) and the two halves were mated at the centre-line. The wing structure was built around two spars of spruce and plywood, with ribs of spruce and stressed-plywood skinning from wing-leading-edge to the rear spar and fabric covering for the rest of the mainplane surface. The generous ailerons, aerodynamically mass balanced, possessed a steel-tube framework with light-alloy ribs and fabric covering.

**Fuselage:** beneath the mainly fabric-covered light subsidiary fairing structure, the strength of the airframe was obtained by using the classic form of a rectangular, rigidly-braced, welded steel tube framework.

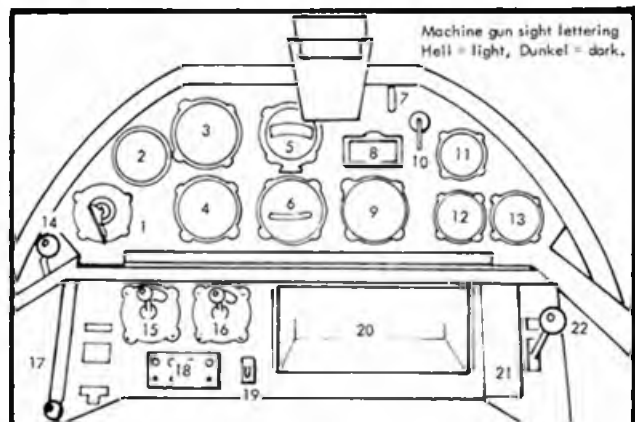
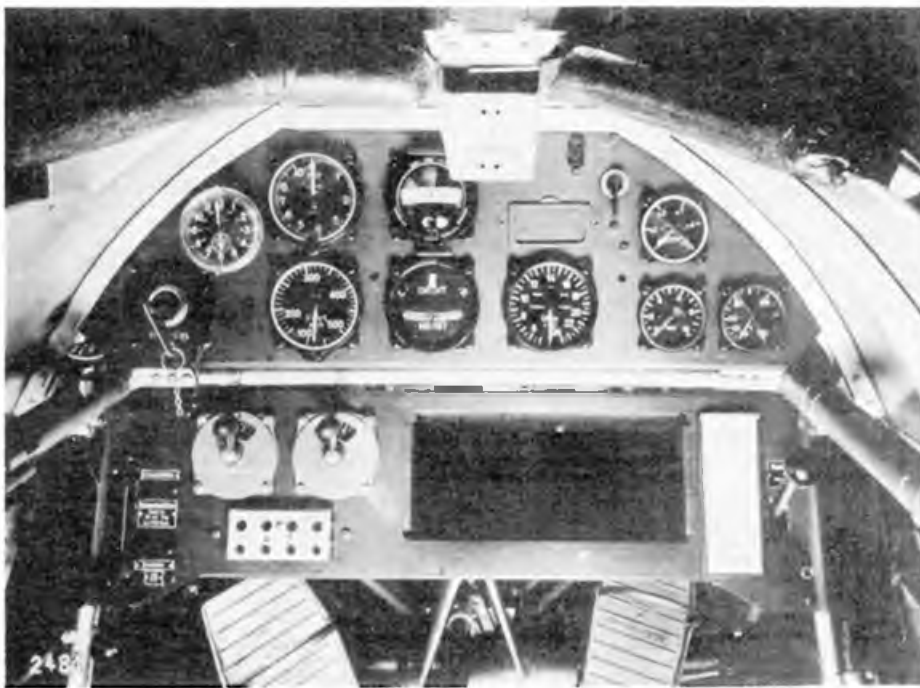
**Tail assembly:** a design 'signature' inherited from the Focke-Wulf take-over of Albatros-Flugzeugwerke GmbH in September 1931 (eg the 1932 Alb. I. 102, later Fw 55) is the forward-stepped tailplane, strut-braced and mounted on top of a rudimentary fin or vertical stabiliser built of welded steel tube extending from the basic framework. But special to the Tank 'signature' was the employment of semi-endplate elevator mass balances which appear again on later designs such as the Fw 58 Weihe

(Kite) and the Fw 200 Condor. All tail surfaces had wooden frames, the tailplane being covered in sheet plywood and the elevators and balanced rudder being fabric covered.

**Undercarriage:** of Focke-Wulf development, the main cantilever legs of steel tube were anchored to the upper and lower longerons of the fuselage framework. Aft-hinged radius-rods carried the wheel axles. Shock loads were absorbed by oleo-spring units. The radius-rods providing the elbow action required the extra base width of the streamlined fairings which give the characteristic 'bell-bottom trousers' look to the fixed main legs; which also incorporated a hydraulically-operated wheel-brake system. The sprung tail was also anchored to the rigid framework of the fuselage.

**Cockpit:** a relatively tight-fit open cockpit with base-hinged plywood access panels on left- and right-hand sides. The seat was of the conventional seat-parachute type and the neat instrument panel had provision for mounting an electrically-operated reflector ('Revi') gunsight just behind the windshield. An unconventional control (on the left-hand side) was that of the Störklappen-Betätigung or wing spoiler — sometimes referred to as 'dive-brake' — which was installed on the mainplane's centre-line near the wing leading-edge to limit the diving speed to 480km/hr (298mph).

**Motor cowling:** the most noticeable feature of the otherwise neatly close-cowled Argus As 10 Srs.III inverted-Vee inline is the asymmetric left- and right-hand arrangements of the sets of four stub exhausts. Early in the flight trials, the test pilot reported that engine fumes were being driven into the left-hand side of the cockpit by the action of the right-hand turning propeller revolutions. This was cured by replacing the flush-fitting exhaust ports with the downward-cranked stubs on the port side and the shorter variety on the starboard side. Both the fuel and oil tanks were situated immediately aft of the engine fire-wall. The cowling was devised for quick access with the whole of the underside opening downwards from the rear. The inertia-starter handle port was on the left-hand side and to the rear of the side cowling.



- 1 Switch
- 2 Clock
- 3 Altimeter
- 4 Air speed indicator (Km)
- 5 Compass with magnet adjustments top and bottom
- 6 Turn indicator
- 7 Electric Machine gun sight plug
- 8 Compass deviator card
- 9 Engine R.P.M.
- 10 Carburettor heat switch
- 11 Manifold pressure
- 12 Oil pressure
- 13 Oil temperature
- 14 Dive brake
- 15 Elevator trim
- 16 Rudder trim
- 17 Fuel cut-off
- 18 Fuel reserve switches
- 19 Generator on/off
- 20 Map case
- 21 Aircraft service card
- 22 Hand pump

### References and acknowledgements

Photographic references are, regrettably, sparse and while admitting the invaluable assistance rendered by recourse to Jane's "All The World's Aircraft" from 1936-45, little attempt was made to change or update photographs. In the English language, the most detailed text and picture coverage is in William Green's "The Warplanes of the Third Reich" A useful modern German work is that of an old friend, Wolfgang Wagner, "Kurt Tank — Konstrukteur und Test Pilot bei Focke-Wulf" (Bernard & Graef-Verlag, 1980) which has served to provide some of the Fw 56 Design Data. The Australian Kookaburra and Karl Rites Markings and Camouflage volumes provide some picture-evidence and some colour drawings.

The author gratefully acknowledges assistance provided freely by Messrs. A. van Ishoven, R. G. Moulton, K. Oberparleiter, H. H. Orke and A. Price.

*Excellent references for the cockpit instrumentation on the vertical panel, with the large void for a map locker and prominent trim controls beneath.*

**Aeromodeller**



# From Control Line News THE HANDLE

## RACING with Jim Woodside

### Comment F2C Team Race — Part 2

Last column I reviewed some of the current 'problems' in FAI Teamrace and concluded with an extract from Pietro Fontana's open letter to the CIAM.

Here now is a précis of some ideas from three well-known UK contributors and a couple of American. I would like to stress that the ideas *do not* necessarily represent the personal convictions of the flyers but should be considered as discussion items. Further, the notions put forward should in no way be construed as official policy statements by this writer, Aeromodeller or the SMAE. Talk over the ideas, add them to your own and then instruct your CIAM delegate. The present rules have served us well for over 20 years and wholesale changes should be carefully considered before application. It might well be worth stating now that a majority of UK flyers want no further changes and preferably the reinstatement of the 7cc tank.

**Dave Clarkson:** Apart from Dave's vast experience as a competitor he was also a jury member at the 1974 and 1976 World Champs.

1. Participation in F2C worldwide is dangerously low — hence great care needed not to kill the event by making it impossibly hard.
2. The 5cc tank is wrong because (a) it is unlikely to reduce airspeed and (b) likely to increase pitstop incidents.
3. The central problem is one of race judging given a 1/2 reduction in lap times in the last eight years.
4. While heavier lines and bigger models will slow the event, the easiest method is to reduce BHP. However rather than the 1.5cc engine, a simple venturi restriction of say 2.8mm would strangle speed and also reduce noise.
5. A possible solution would be:
  - (a) venturi size limited to 2.8mm;
  - (b) tank size unrestricted;
  - (c) two compulsory stops in a heat, five in a final.
6. Present rules are fine! (for the racers).

**Dave Campbell:** Dave, along with his pilot Dave Nixon, has many years of experience and success — especially in Class B.

1. FAI Team Race should be difficult as it is the premier event for experts. The present rules are OK but if some slowing down is needed:
  - (a) fit 0.35 lines;
  - (b) ban the functional flying wing model;
  - (c) specify a maximum venturi size — this is also easy to process.
2. The basic problem lies in the poor health of the UK domestic control line racing scene. 1/2A and Goodyear are on a difficulty (and financial) level comparable to F2C. Engine rules similar to mini and Class II Goodyear

August 1983

might encourage the new faces needed to strengthen F2C participation. The new 'experts' might even revive Class B.

**Derek Heaton:** many times a member of the UK team and a jury member in 1981 and 1982.

1. Line diameter 0.4mm with 10mm separation at the tip.
2. Minimum model weight of 400gms.
3. Minimum prop diameter of 200mm.
4. Maximum carb. of 3.00mm with no venturi shape.
5. Model dimensions: depth — 120mm; width — 60mm; x-section — 56cm<sup>2</sup>; wing area — 14.5cm<sup>2</sup>.
6. Minimum wing thickness: root — 12mm; tip — 6mm.
7. Max fuel tank 6cc.
8. No pressure refuelling.
9. No fuel shut offs.
10. No multi-function valves.
11. Minimum wheel diameter 30mm. Minimum wheel thickness 5mm. No shrouding of the wheel. Perm any choice from the above!

**Henry Nelson:** Engine man Henry favours the introduction of silencers as the long term solution.

**Walter Perkins:** supports the move towards larger models (to incorporate silencers?)

I would like to thank those who have taken the time and trouble to write.

Let me finally emphasise that those with an axe to grind are more likely to speak out than the silent majority who may well be in favour of the status quo as expressed in the 1982 rules with the possible exception of the likely changes in the numbers of flights and/or rounds system.

The correct combination of rule changes should be a matter for consent amongst the competitors rather than imposition by well intentioned if misguided rule makers.

## Construction Techniques

### Carbon Fibre Spars

All other things being equal the weight of a typical solid wood wing will be governed by the density of the wood originally chosen. Obviously wood of 4lb./cu. ft. will produce a wing half the weight of one constructed in 8lb./cu. ft. The problem is that the lightest grades will not give strength and reliability. Traditionally, harder grades and other timbers are used in strategic areas such as:

- (a) leading edge — pine, bass or obechi;
- (b) wing tips — 1/8in. ply or fibreglass board (PCB);
- (c) trailing edges — hard balsa edged with lime.

The strengthening members will allow the use of the lighter grades around 6lb./cu. ft. or less. Furthermore, the use of quarter grain timber will give a stiffer wing across the cord. Some years ago the introduction of glassfibre covering to replace tissue and dope gave a welcome increase in overall strength. These techniques will be discussed

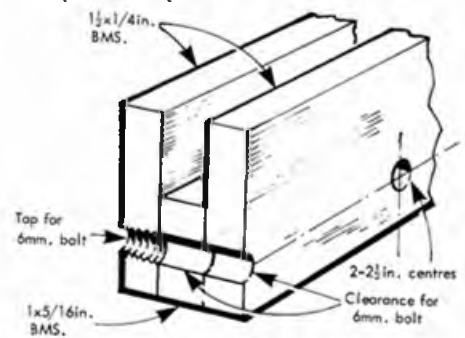
at a later date. In the meantime build in some carbon spars. The increase in sparwise strength is just phenomenal and more than repays the extra trouble involved.

### Stage 1: making the mould

The length of the mould is decided by the length of the spars needed. My own mould is 36in. long and produces 33in. spars using full length tows of carbon. However a 30in. mould should be adequate for most purposes. Needed are 2 pieces, 1 1/2in. x 1/2in. x length required; 2 pieces 1in. x 1/16in. x length required.

Material: bright mild steel — flat, straight and with clean sharp corners.

Take one of the wider strips and mark out a line 1/2in. from one edge. Mark out the position of bolt holes which should not be more than 2-2 1/2in. between centres. Now put together a sandwich of the 1 1/2in. strips either side of a 1in. strip. Hold together with clamps. Decide on your bolt size (1/4in. or 6mm diameter is adequate). Select the tapping drill size and drill clean through the three strips. Be careful not to disturb the strips during this process, which is best done on a pillar drill. Mark the pieces to enable assembly in the same orientation. Tap one of the outer strips to suit your bolt size. Re-drill the other two strips to the clearance size for the bolts. Put together the parts using all bolts to check for accurate easy assembly.



The remaining strip of 1in. x 1/16in. is used to compress the carbon and epoxy in the trench made by the other three strips.

Thoroughly degrease all metal parts. Wax the strips using a non-silicone type polish. Now paint all inner surface with a mould release agent such as PVA, bought in fibre glass moulding shops. Assemble the trench strips and paint in an extra coat of mould release PVA onto the joints and leave to dry.

### Stage 2: materials

The materials needed are carbon fibre tows of about 30in. length and epoxy resin. Sounds easy but expect some little trouble and expense in locating these.

The best tows are pre-impregnated carbon as these wet out better. Try your local moulding companies as a starting point especially if they are involved in racing canoes. The Hyfil Company of Bristol sells suitable material but, for the modeller, have a high minimum order charge. Shadow Racing of Florida does sell good carbon and in the end this may be the easiest answer.

A low viscosity epoxy resin is needed. The one I use is Araldite 1927 GB. You are not likely to find this on sale although if you can find a firm with an account with Ciba-Geigy they could order a pack of 500gms at about £8.00. However, I have seen thin epoxies on sale in my local hobby shop and these may well be just as suitable.

### Stage 3: making the spar

- Mix the resin to the instructions — usually 2:1 resin to hardener. Hypodermic syringes are good for this. A total of 6cc is enough for one spar.
- Lay out six to eight tows of carbon.
- Wet bottom of the trench by spreading some resin with a 1/4 in. wide stick. Lay in the tows two at a time, adding extra resin between times. Insert the press bat strip and cramp down using C-clamps every few inches. I use a total of five which I consider a minimum.
- Cure in a warm place such as a radiator top and leave for 24 hours.

### Stage 4: preparing the spur

- Split open the mould and remove the spar.
- Wash and clean the mould.
- With the back of a blade remove moulding flash from the spar.
- Wash any mould release agent from the spar using soapy water.
- Rub the spar to a matt finish with 300 grade wet and dry paper.

You will need at least two spars for a wing so repeat the process.

In the next column I will deal with fitting these 1/16 in. x .015 strips of carbon into your team racer's wing.

## Goodyear — 27th March '83 — Church Fenton

ORGANISED BY SHEFFIELD C.L.A.M.S.

The first day of summertime, but no one had told the weather which did its best to deter even the most ardent enthusiast, by being almost as bad as its forecast. The day started out wet with a fresh cold wind, but by mid day it had improved slightly and provided a dry runway for the remaining part of the day with a freshening gusty and very cold wind.

The forecast morning weather and the rumoured ban on vehicles onto the aerodrome probably resulted in the low turn out of nine teams, eight of which competed for the handsome trophies which were on offer for each member of the teams in the final.

Two new teams, comprising of very familiar faces were in action, namely John Schofield with pilot Tom Millar and Ed Needham with pilot Dave Clarkson.

Ed and Dave were flying a *Boo-Ray* which featured a built up wing powered by a front induction Rossi running on crank case pressure with a 9.5mm dia venturi utilising a large fuel tank which had sufficient capacity to complete a 100 lap heat without the need for re-fuelling.

Tom and John had two new models, the first being a very well finished *Mr. B.* which was also powered by a front induction Rossi (but was not used on this occasion). The other was a *Scoville Star Dust* powered by a Cippolla rear induction F.A.I. motor on suction.

Another Cippolla was featured in the action in the hands of O'Neil/Bollen but unfortunately the expected 'Sparkling' performances were not forthcoming, as although the motors gave a reasonable performance, in the region of 23 secs for 10 laps, they seemed reluctant to give out either the power or the revs that would normally be expected if used in an FAI model. This was probably due to the fact that they were not running in a controlled cooling situation associated with an FAI model for which they are designed, resulting in crankcase distortion from the over cooling of the front of the motor.

The actual competition commenced at 1.45 pm and was run on the system favoured by the

### GOODYEAR RESULTS 27th MARCH

Team	Model	Motor	Best Heat	Final
1. Millar/Schofield	Scoville Star Dust	Cippolla	4:26	9:01
2. Clarkson/Needham	Boo-Ray	Rossi F.I.	4:16	10:18
3. Catlow/Jephcott	Ol'Blue	Rossi F.I.	4:10	(7 laps)
4. Langworth/Broadhead	Miss San Bernardino	Rossi F.I.	4:29	
5. Dalglish/Dalglish	Deer Fly	Rossi F.I.	4:39	
6. O'Neil/Boden	Ol'Blue	Cippolla	5:08	

Northern Area flyers of three rounds (no semis) with the fastest three teams into the final.

At the end of the three rounds, Catlow/Jephcott, using their Nats model and a front induction Rossi on suction, had the fastest time of 4:10 (having sorted out their poor starts and restarts which dogged them for the second half of last year.) followed by Clarkeson/Needham with 4 mins 16 secs, and Millar/Schofield with 4:26 and the final promised to be an exciting race.

Catlow/Jephcott were away on the button, quickly followed by Millar/Schofield, with Clarkeson/Needham a lap or two behind, but Lap 7 saw the demise of Catlow/Jephcott after their Rossi failed, stopping very suddenly, having broken a con-rod. The slightly superior air speed of Millar/Schofield combined with their consistently quick pit stops, coupled with a mis-catch at one pit stop and a poor refuelling pit stop by Clarkeson/Needham assured Tom and John of victory.

Our thanks to Sheffield C.L.A.M.S. for running the competition and to the R.A.F. for the use of the airfield.

## Goodyear — Northern Area Spring Rally — Church Fenton — 17th April 1983

After the disastrous weather which annihilated the Area Centralised event of the previous weekend, the conditions were good with sunny periods and a slight wind.

The competition which was run by Hayden Sykes with the assistance of Messers Walker, Ward, got under way at approx. 1.0 pm, and was again run on the 3 rounds system, with the fastest three going into the final.

Round One saw most of the action for the twelve teams that entered, and many fast races took place. Three teams recorded times below 4:20, Catlow/Jephcott put in a sparkling performance using their Rossi Front Induction/Ol' Blue combination to set a new record of 4 mins 04 secs, (not as yet ratified) with messers Langworth/Daly and Millar/Schofield recording 4:12 and 4:22.5 respectively. It was these three teams that made up the final, but with a team reversal taking place, when John Schofield took on the pilots roll after Tom had twisted his knee in one of the earlier rounds.

This roll reversal may have had some bearing on the final, which was something of a hairy and eventful occasion. It featured a considerable amount of jostling in the centre, some handle swapping and even an undertake on the blind side of the circle. The race was a very close affair but was eventually decided when Peter Jephcott called John Catlow in for an early pit stop having mis-read the lap counter, which resulted in them running out of fuel with just three laps to go, and losing them the first place to Berni Langworth and John Daly, with John and Tom coming in a close third.

### GOODYEAR RESULTS 17th APRIL

Team	Model	Motor	Best Heat	Final
1. Langworth/Daly	Miss San Bernadeno	Rossi F.I.	4:12	8:46
2. Catlow/Jephcott	Ol'Blue	Rossi F.I.	4:04	8:54
3. Millar/Schofield	Star Dust	Cippolla	4:22.5	9:23
4. James/Howard	Ol' Blue	Rossi R.I.	4:27	
5. Dalglish/Dalglish	Deer Fly	Rossi F.I.	4:34	
6. Kelly/Copley	Ol' Blue	Rossi R.I.	4:36	
7. Gardener/Archer	Lil Quickie	Rossi F.I.	4:51	

The Novices had a good day with notable times being put in by the Dalglish brothers with a 4:34 and a 4:36 by Kelly/Copley as well as the Gardener/Archer (yes those of FAI fame, but who normally race in different teams) making up the Novice final.

Unfortunately I am not able to report on this event as it was run simultaneously with the Senior final but congratulations are due to the Gardener/Archer team who were the winners followed by Kelly/Copley and Dalglish/Dalgish.

Once again our thanks to the Northern Area of the S.M.A.E., to Hayden Sykes for running all three events (F.A.I. 1/8 A and Goodyear) and to the R.A.F. for the use of Church Fenton.

## RAF, Church Fenton — 17th April 1983 F.A.I. Aerobatics (F2B)

A fresh and variable wind made flying quite difficult at times, but the sunshine made conditions relatively pleasant.

After some morning practice the competition began at 1 p.m. with Andy Brough flying an O.D. in his first F2B competition.

Barry Robinson followed flying his well proven 'Northwind V' now Merco 61 powered. The model handled the conditions well for its large size producing an early leading score of 999.

John flying a 'Sundance' American design, had not flown for some time and considering this, flew well.

Tony Eifflander, now using a larger model powered by P.A.W. 29, flew fast and accurately.

Bill Draper flew his repaired 'Superhawk' into 2nd place with 987. The model had suffered a lead-out failure prior to the last Nationals.

Peter Arkley had the next flight with the black and yellow 'Kittyhawk'.

Alan Madeley was flying a new, neatly painted design called 'Devotion' (christened by his wife).

Another new model was the 'Superhawk Mk II' flown by Ken Reeves. This is a restyled 'Superhawk' with re-shaped tail surfaces and an angled cowl line along with a pointed spinner looking very elegant.

Nev Dickinson followed, having been moved back to last flight while he sorted out a problem. He was flying a new model to competition, the 'Linesman' attractively painted with novel designs, powered by OS 40, the model looked particularly smooth in the wingover.

Scores rose for all in Round 2, possibly because the sun had moved from its dazzling down wind position.

Round 3 saw a fall in some scores, most notably Bill Draper's. This was unavoidable as Bill suffered a sick engine run losing him the schedule beyond the square loops.

Thanks to the judge Paul Concanon, and to the scorers, who allowed the pleasant day's flying to take place.

Final positions: Barry Robinson 1st, Bill Draper 2nd, Nev Dickinson 3rd.

## Novice Stunt

A pleasant surprise was the sight of novice stunt, not flown in the previous few competitions.

Richard Illingworth who now has a 'Superhawk', decided to use his 'Twister' profile design which he flew comfortably into first place.

Thanks to the judge, Dot Dickinson.

FAI Aerobatics (F2B)	Best	Two
1. B. Robinson	999	1019 991 2018
2. C. W. Draper	987	999 318 1987
3. N. Dickinson	879	931 934 1865
4. A. Eifflander	821	907 878 1785
5. P. Arkley	824	871 855 1726
6. J. Howson	682	854 824 1678
7. A. Madeley	739	810 784 1594
8. K. Reeves	724	768 786 1551
9. A. Brough	488	617 663 1280

## NOVICE STUNT

1. R. Illingworth	286	411	442	853
2. H. Sackson	192	252	285	537
3. J. Barry	-12	146	177	323

## 1983 British Diesel Combat Championships — 1st Round

The first round of the British Diesel Combat Championships was held on the Peterborough Embankment site on March 27th. Despite appalling weather on preceding days and a bad forecast, there was a good turnout for a day marred by frequent drizzle and intense cold. With a two-life system and an 11.00 a.m. start, it was fortunate that it was the first day of summertime since prize giving took place at 7.00 p.m.!

There appeared to be an increase in the number of entrants using foamies. This seems to be partly due to a desire to build larger and lighter models but mainly as a route to a quick model by converting old FAI models.

In the first round bout between Geoff Ferguson (Cosmo) and Brian Waterland, there was freak flyaway when Waterland's lines were cut by his opponent's propeller and the model disappeared vertically upwards through the clouds with three minutes engine run still in the tank. The model and engine (Oliver Tiger IV) was returned intact the next day following an appeal on the local (Hereward) Radio. Name, address and reward stickers would appear to be required on combat wings as well as free flighters.

The younger fliers continue to improve. Richard Scully (Wharfedale) was unlucky to lose on ground

time when holding Mike Whillance (Urmston) to a three cuts each draw and Jeff Sizer (P'boro) lost to Neil Gill two cuts to one in an excellent bout. Andrew Cox (P'boro) won his bouts against both C. Moore (Wolves) and Ian Thompson (Lincoln) but retired when he ran out of models. This illustrates the need to turn up with three models if possible.

As usual the most common motor was the Oliver Tiger with one or two MVVSs. Gerry Hobbs (P'boro) used a 3.5cc Rivers Silver Arrow in his win over Chris Moore. The Silver Arrow showed a very good turn of speed but not as good as the Rossi diesel used by Mark Jarrett. This motor is legal under the rules and turned a regulation 7 1/2 in. x 6 in. propeller.

The regular names won through and experience showed. In the semi-finals Pete Tribe beat Rob Roy in one of the fastest, if shortest (20 seconds) bouts when Rob's model was irreparably smashed and Neil Gill lost to Mike Whillance on ground time with one cut each.

Rob Roy elected not to fly for 3rd place, leaving Neil Gill third.

The final was an excellent bout and a convincing win for Pete Tribe with five cuts over Mike Whillance.

## Results

1. P. Tribe (Cosmo)
2. M. Whillance (Urmston)
3. N. Gill (Peterborough)

# COMBAT with Paul Smith

## North American Scene

This year's United States and Canadian nationals will both be held in the north eastern part of the continent. The Canadian Nats will be held at Huron Park, in Centralia, Ontario, as is the custom in odd-numbered years. The site is a former RCAF base converted into an industrial park and college. Good camping and dormitories are available at reasonable cost. Flying facilities are top quality with the exception of course, of free flight which invariably finds the field too small. The site is about 100 miles west of Toronto. The scheduled dates are July 9th/17th.

One week later and about 500 miles east is the AMA (United States) Nationals. The site is a new one, Westover AFB, Massachusetts, and the dates are July 24th/31st. Someone who wanted to attend both, could fly into Toronto, fly in the Canadian

*Left: A Dragon (Slow Combat) model set up with 2 wheel u/c to comply with one revision of the ever-changing Canadian rules. Below left: This 'Superstar' FAI was used in the MACA Nats by Nur Iskandar Taib of Malaysia. Nur hopes to represent his country at the 1984 World Championships. Below: Shadow, fast combat model by Doctor Terry Passen of Chicago. He uses this design for fast, slow, FAI and 1/2A. Below right: The 'General Lee' a fast combat model based on the 'Superstar' FAI design.*

Nats, tour for a week, fly in the US Nats, and depart from Boston or New York. For entry and official details, contact MAAC, Box 9, Oakville, Ontario, Canada L6J 4Z5, or AMA, 1810 Samuel Morse Drive, Reston, VA, USA 22090.

## FAI Combat Rules

Aeromodeller and other publications have already carried reports of the new 1983 changes to the combat rules. These changes have generally been well received by the flyers that I have contact with. With the exception of the 'engine tether' which was unnecessary, the new rules will help to make FAI combat a better event. The ban on running spare engines continuously will save on fuel, glow plugs, engines, and eardrums. The 150 Newton pull test is more than the 100 we originally asked for, but not excessive. It shows that the FAI and the flyers are concerned about flyaways. Limiting the use of spare engines and lines will have a small, but positive effect on reducing the amount of equipment consumed.

Unfortunately, all the positive effects of these changes and the good works of interested modellers over the years are in danger of being destroyed by one single new proposal. That is of course, the '1.5cc' rule. I would like to point out that although this rule was originated by the Control Line Subcommittee of the FAI, under the chairmanship of Dr. Laird Jackson of the United States, this is definitely not an American proposal. When word spread among the combat flyers of America that Doc was advocating this change, he was immediately deluged with letters, petitions, and phone calls demanding that he reverse his position. I know of no combat flyer who believes that a 16oz. (454gms) model with a .15in<sup>3</sup> (2.5cc) engine is too much to handle. We regularly fly combat over here with .30in<sup>3</sup> (6cc) engines and see no reason to downgrade that event either.

The World Championship is the Olympics of modelling. There is no reason that World Champs events should be simplified to the level of beginners. Using 1.5cc engines would give the World Champs the image of a local junior event. The Olympics have no intention of banning events such as boxing, bobsledding, ski jumping, and pole vaulting, simply because there is an element of risk. Neither should the FAI degrade combat, speed, racing, and free flight to the point that the contestants are embarrassed to be involved.

## 1982 MACA Nats

This year's contest was held in Chicago, Illinois, at a very nice city-owned model field. Four events were held: slow combat, FAI combat, fast combat, and 1/2A combat. The fast and slow events were flown using the double elimination first round system, FAI and 1/2A were single elimination. This plan resulted in two very full days of combat. One Canadian and a Malaysian student entered, giving the contest some international interest. Jordan Segal won FAI, Bob Burch slow, Rich Rupper fast, and Ed Brzys 1/2A.

This was another in the annual series of very enjoyable MACA National Combat contests, a combat contest run by combat flyers.





**A**REGULAR pattern now seems to have been set for moving the location of The Indoor Scale Nationals, alternating in recent years between Derby and Milton Keynes.

Whether this arrangement really satisfies the needs of modellers from the extremes of North and South is open to debate since the two venues are only approximately seventy miles apart on the M1. The price of petrol being as it is, however, one must face up to the fact that to any journey an additional 140 miles is an important financial consideration on top of entry fees. This did not prevent one true enthusiast from making the round trip from Portsmouth, though!

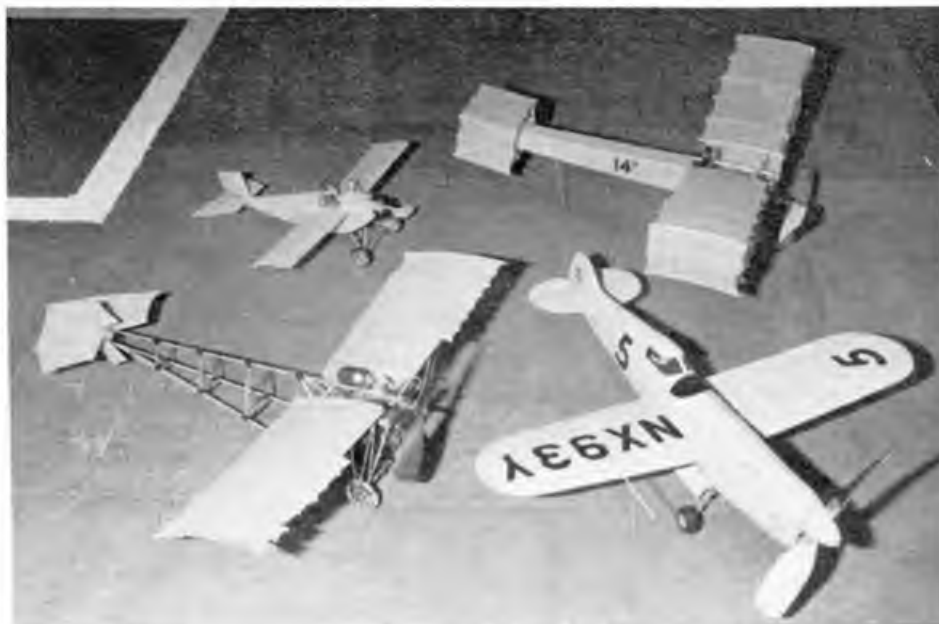
Each venue has its merits. Middleton Hall at Milton Keynes is much larger in floor area with a higher ceiling and as such is more suitable for the larger type of model. Derby, though smaller and noticeably darker, is a self-contained space where there is no chance of these fragile models being 'helpfully' retrieved by non-modelling members of the public. With a smooth ceiling, Milton Keynes has suspended loudspeaker systems that are well worth avoiding and although the exposed steel trusses to the ceiling at Derby are rather prominent and have claimed models in the past, Mark Hinton showed how to cope with them when his winning peanut *Santos-Dumont* on one flight went through a gap of approximately 9in. between the top edge of a truss and the ceiling.

The number of casualties amongst the not-quite-trimmed new models was remarkably small on this occasion and flying standards, particularly of the larger models, was high. As one of the static scale judges, Vic Wilson spent most of the afternoon with his head down deeply engrossed in books, plans, magazines and models, but remarked that he could tell that the flying was good by the amount of applause he could hear in the background. There is, however, no truth in the rumour that flight judges next year will be enlisting the aid of a clapometer to ascertain scores.

There were a few small quibbles over rules and their interpretation but one would look in vain for a team of more experienced judges capable of dealing with such problems. Dennis Thumpston, Roy Yates, Bill Daniels and Vic concentrated on static judging and flight judging for Open Rubber and CO, was by Terry Manley and Dave Clarkson. Between them they managed to deal with roughly four dozen models in about five hours which represents a lot of hard work if a high standard is consistently to be maintained. Despite a P.A. system that seemingly incorporated a voice scrambler that would have done credit to the secret service, the various flying sessions were carefully organised.

Free practice and trimming was allowed 10:30 am to mid-day and most of the contest flying was over by about 4:30 pm, leaving another hour or so for other models and non-contestants to make us of the hall.

Each contestant was given a number and was called to fly in turn as the flight judges worked through their sheets. More than one Open Rubber model was seen to fade somewhat on launching because of having been held for too long with the motor fully wound. To get the most performance from rubber, a model should be launched within



Above: part of the Mark Hinton stable of indoor free flight models. Top, a 'grape-nut' scale Caudron at just 6in. span, contrasted for size with his Peanut winning *Santos-Dumont* 14-bis seen rear right. Bottom left is his CO, powered *Denoiselle*, with Art Chester's 'Goon' racer. Right: Chris Strachen's CO, powered Bristol Prier is built from a commercial plan covered in natural early bird tissue and flies extremely well.

about thirty seconds of being fully wound up — just enough time for you to comfortably move from your helper or winding jig to a launching point. To see a motor wound to maximum turns and then held for some time on even the simplest of torque meters will clearly demonstrate the value of this rule of thumb.

Apart from most of the regular competitive models, several new Open Rubber subjects were giving a good account of themselves. Roy Ashby's very large *Sopwith Schneider*, winner of this class at Crawley, was found to be over the S.M.A.E. 3oz weight limit and could not be accepted as an entry. As this rule has been effective since indoor scale's inception in this country over ten years ago, this small item should not have been overlooked at any event being run properly under the aegis of the S.M.A.E. Roy was most disappointed but not sufficiently so to prevent him from giving the model several flights later in the day which were widely appreciated as the *Schneider* flies so well that despite its size and weight, it poses little danger to itself or others.

As more people are graduating to the larger model, it is obviously wise to check weights very carefully indeed and it seems that one way we could all perhaps get somewhere near a standardised and widespread method of checking models that are near the limit would be to use the letter scales at your local Post Office. If one uses a polite, tactful approach and does not turn up with loads of models at a busy time, then this should not be too difficult to arrange occasionally.

The highest flight score in Open Rubber went to Reg Boor's new *Heinkel He 100* which is based on Hurst Bowers' Flyline Kit. This kit must be the leading contender for the title of the best flying low wing free flight scale kit ever produced. Reg's version



features additional wing ribs, reduced tailplane area and a specially made three blade plastic prop which uses part of a large plastic knitting needle as a basis for the hub. The 23in. span model flew slowly and steadily from a take-off, without hanging on the prop as do many high wing subjects and the straight and level landing run with the tail in the air was a delight to watch.

Apart from the winners which were respectively Butch Hadland's *Lacey*, Peter Frostick's *Buhl Pup* and Geoff Anderson's *Wittman Tailwind*, some notably good flight scores were made by Chris Strachen's *Baby Ace* from the kit by Rob Peck and Ken Bate's *Piper Cub*. Two other models in this class which were liked by the judges and gained high static marks were Chris Champman's *Hauker Hurricane* and G. Hannah's 22in. span *Antoinette*. In contrast D. Wolstenholme's 21in. span *Halton Minus* flew extremely well, but the simplified construction led to only a modest static score. For once, Open Rubber was not the poor relation in terms of number of entries, which was encouraging to see.

CO scale was won again by Nick Peppiatt's *Sopwith Tabloid* using the twin cylinder Brown motor, but only by a remarkably small 0.6% over Geoff Spencer's new *D. H. Tiger Moth* in camouflage colours.



Far left: Reg Boor looks pleased, as well he should, with his new Heinkel He 100, modified from the Flyline kit. 23in. span model is dark green. Left: Rick Granger gives some idea of the size of his Avro 560 flown in CO<sub>2</sub>. Wings are knock-off and flights are excellent. Below: Geoff Spencer's unusual Polikarpov R5 biplane features Russian Eastern Front markings consisting of white dope over red star insignia resulting in pink wingtips! In foreground is Harry Perrin's CO<sub>2</sub> Piper Cub in military markings. If the design is your own Harry, we would love to publish the plans in Aeromodeller.

Mark managed yet another win in Peanut Scale with his other Santos-Dumont design, the 14 bis canard and no, it wasn't the same old model that has flown so outstandingly well in the past but a brand new version with much more attention to detail and effort put into the finish, as its static score clearly shows.

In second place Mike Hetherington's Fokker DVIII is a well 'matured' model, shall we say, but totally reliable in flight characteristics and an ideal practical peanut subject. Mike had another new interesting paper built subject in a 20in. span Junkers F13 airliner which has yet to gain its flight 'wings'.



### INDOOR SCALE NATIONALS 1983 — RESULTS

Open Rubber		Scale	Flying	Total
1. Butch Hadland	Lacey	114.5	168	282.5
2. Peter Frostick	Buhl Pup	117.5	156	273.5
3. Jeff Anderson	Wittman Tailwind	126	135	261
4. Chris Strachan	Baby Ace	81	153	234
5. Ken Bates	Piper Cub	101	124	225
Reg Boor	Heinkel He 100	53	172	225

CO <sub>2</sub>		Scale	Flying	Total
1. Nick Peppiatt	Sopwith Tabloid	936	930	1866
2. Geoff Spencer	Tiger Moth	684	1170	1854
3. Butch Hadland	Lacey	672	1105	1777
4. Mick Staples	Bristol Scout	894	775	1669
5. Chriss Strachan	Bristol Prier	558	1060	1618

Peanut		Static	Flying
1. Mark Hinton	Santo Dumont	81	165.5
2. Mike Hetherington	Fokker DVIII	66	137
3. Peter Frostick	Piper Cub	62	89
4. Chris Strachan	Andreson	59	99
5. Lindsay Smith	Guppy	73	64
Butch Hadland	Morane Saulnier	58	99

The latter achieved the highest flight score by a clear margin but the static score was not up to the same standard. Geoff also had with him a most unusual Polikarpov R5 biplane for rubber power that was not entered in the contest, but which flew well and was finished in most unusual Soviet markings. Information for this model came from one of Kenneth Munson's colour books in the small series published by Blandford. These books are ideal sources of inspiration for unusual models but additional documentation is usually required for a truly competitive model.

Highest flight score went to Chris Strachan's Bristol Prier monoplane built from a plan by Otto Kuhn published in Bill Hannan's Obscure Aircraft series. The model demonstrated one of the most clearly defined climb/cruise transitions I've seen as it went from take-off sharply up to approximately ten feet altitude at which point it levelled off uncannily realistically and then cruised gently down to land with the motor still running. As far as accuracy goes, the tail surfaces are enlarged by quite a sizeable amount, however.

Rick Granger's latest Avro 560 also drew a lot of attention because of its excellent flying qualities. Easily the largest model at the meeting, in wingspan that is, at just over

30in, the Avro is simply built and finished in natural tissue. The smooth and steady flight characteristics ably demonstrated that in indoor flying, the key to success does not lie simply in a large gross wing area. The Avro's wing is of high aspect ratio and its effectiveness comes from having a good section and virtually no drag producing encumbrances such as struts or complicated rigging. All of this must be combined with as little weight as possible of course. Power is a standard Telco motor.

Mick Staples' Bristol Scout (featured on the cover of the April issue acquitted itself well in fourth place to show that not all the winners at the Model Engineer Exhibition, where it won the Aeromodeller Cup, are merely well-built, static models.

In contrast to Rick's Avro, the smallest model entered in CO<sub>2</sub> was Mark Hinton's Peanut sized Demoiselle. Aiming again at light weight, Mark once more has made use of tubular grass stems for the tail booms and these are very effective at representing bamboo. Power is by a Campus A 23 using the smallest gas tank available and although the model would stay aloft reasonably well, the quality of flight was rather unsteady. This subject is very tricky to trim and fly well and the high location of the gas tank does not help a great deal.

Together with Peter Frostick's Piper Cub and Butch Hadland's Morane-Saulnier it was nice to see some new names and models at the upper end of the results sheets with Chris Strachan Anderson biplane and Lindsay Smith's Guppy ultralight biplane.

That elusive triplane floatplane with twin motors and capable of three minute max that theoretically is going to rout the opposition automatically has yet to put to put in an appearance. It is a good thing for the hobby that sensible, straightforward models flown well still seem to provide the best road to success. A sign of the times is that twenty four entries in Peanut is regarded as modest, such is the strength of interest in indoor flying.

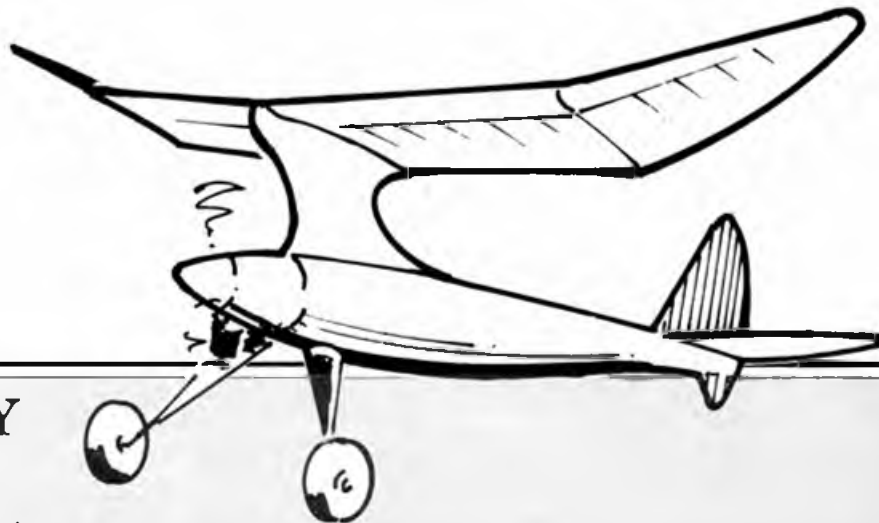
Special thanks are due to contest Director Doug Sheppard whose preparations and organisation set a new standard for this particular event and hopefully they will be maintained next year. Several regulars commented happily on the opportunity to fly in well discipline and uncrowded airspace despite the large numbers of models present. For those who are less competitive minded, Doug his planning to organise another event along the lines of an indoor scale fly-in later this year at Milton Keynes. Watch the events calendar for further details.

TWO SIX feet wingspan pylon power models with elliptical wings and tails appeared in this country after the lifting of the ban on flying power models in 1944. Both appear to have been influenced by Carl Goldberg's 10ft. wingspan *Valkyrie* which was described in the September and October issues of *Air Trials* in 1938.

The first, built by Bill White used a NACA 6412 aerofoil and was powered by a Brown Junior Model B, while the other machine, the subject of this article was designed by R. V. Bentley from Blackpool and used a Goldberg aerofoil. It had a much higher pylon than White's model, was generally of simpler construction and was powered with an Ohlsson Gold Seal of 9.25cc.

Bentley had previously made 42in. wingspan models for the Ohlsson 23 engine, based on Goldberg's *Zipper Mercury* designs, to check the American claims on rates of climb and was so impressed with the 750ft. altitude that 30 seconds power runs produced, that he decided to make the larger sized model, which he then described in

# Cloud Dozer



BY R. V. BENTLEY

(Text by Alex Imrie)

Model Aircraft during 1946 and named *Cloud-Dozer*.

Initial trimming flights were undertaken in windy conditions and various degrees of damage resulted, but Bentley was of the opinion that the model was capable of outstanding performance and while a full listing of his competition success with *Cloud-Dozer* is not to hand, the machine did win the Blackpool Rally late in 1946.

It is an attractive model and building it should present no problem to vintage enthusiasts. The constructional notes that follow, condensed from R. V. Bentley's serialised feature in *Model Aircraft* merely highlight areas where special care is necessary, since the plans are self-explanatory.

## Fuselage

Medium balsa keel, sheets butt joined as necessary, two  $\frac{1}{16}$ in. hard balsa keel shapes are cemented to the main keel and the front fuselage former built up. After making the motor mount bulkhead, ensure that this fits the front former accurately and glue the latter in place, followed by the rest of the bulkheads, down to the beginning of the twin keel. A  $\frac{1}{8}$ in. square hardwood stringer is fitted between bulkheads at the position occupied by the dethermaliser mechanism. The fixed guide for the pull rod is cemented between the twin keels. Attach the underfin base and the  $\frac{1}{8}$ in. hard balsa tailplane platforms. Now fit the formers to the twin keels at this position. The motor mount bulkhead and battery box are next made, the mounting shown on the plan being 18 gauge dural for a radically mounted motor. Readers building the model can ideally use the 10cc Ohlsson 60 engine and thus retain the radial engine mounting used for the original's Ohlsson Gold Seal engine. However, substitution of beam mounts will eradicate the vibration that all sheet metal mounts seem to have and this vibration soon cracks the dural. If you decide to install beam type

**Revival of a classic style Pylon free flight design of 1946 vintage, originally serialised in MODEL AIRCRAFT.**

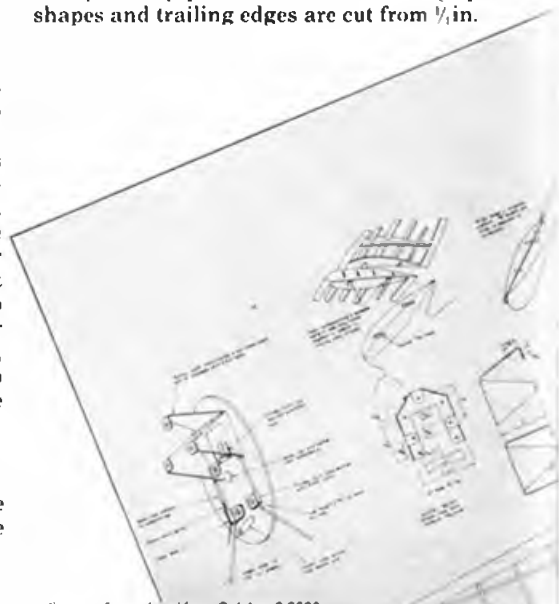
mounts, ensure that the thrust line remains unaltered. The dethermaliser pull rod is 16swg piano wire, install and make sure that it works freely. Use two master planks on the fuselage when commencing the planking, one on each side, ensuring that the keel remains dead straight and continue planking alternate sides with every plank, working upwards towards the pylon. Fit the 1mm plywood steady on number five bulkhead then complete the planking of the lower portion. Some of the planking can be tricky and steam-forming is suggested, in order to manage the pylon and the portion below the tailplane platform. The wing platform comprises three laminations from  $\frac{1}{8}$  medium balsa, make two additional platform shapes that will be cemented to the wing lower surface to act as fairings.

Builders might find that carved shapes from block will be easier to use than planking at the base of the pylon at the front. Before completing the pylon planking make and install the two 16swg wire stirrups for wing attachment. Do not make the cut-out for the dethermaliser unit until this is to hand, in order to ensure a close fit. The lever for this unit, when in the closed position, must allow the pull-rod to slide easily into the locking tube without resorting to the use of oil!

## Wing

Care must be exercised in cutting out the  $\frac{1}{8}$ in. medium balsa wing ribs, especially the

spar slots, which must be an accurate fit on the spars. The root ribs are from  $\frac{1}{8}$ in. hard balsa faced with 1mm plywood on one side. Remember that these are handed, so make one left and one right. Spars are from  $\frac{1}{8}$ in. hard sheet balsa and these incorporate the required dihedral angle. They are butt joined at the dihedral breaks for initially assembly, attached firstly to the root ribs, then all the remaining ribs and half ribs fitted, except those at the dihedral breaks, which are fitted after the dihedral joint strengthening pieces are attached. Wingtip shapes and trailing edges are cut from  $\frac{1}{8}$ in.





balsa. After rough shaping, these are slotted to take the tail of the ribs. Leading edges consist of four laminations of  $\frac{1}{16}$ in. balsa sheet cemented on one by one held by pins until dry. The jointing spars for the centre wing join are made from two laminations of very hard  $\frac{1}{16}$ in. balsa. Boxes are built around them with the wings securely bound together by the root ribs to get the correct dihedral angle. Joint spars should be rubbed with castor oil to facilitate removal, this will expand the wood slightly and the slippery surface will ensure an easy but solid sliding joint. The wing structure before covering should weigh approximately 7oz.

### Tail unit

Similar construction to the wing, but easier. Ribs are from  $\frac{1}{16}$ in. medium balsa, spars being also from this material, straight on the top edge, with the taper applied only to the lower edge. Once again, accurate rib slots are essential for exact construction. The trailing edges and tips are cut from  $\frac{1}{16}$ in. balsa, shaped and slotted for the rib

tails while the leading edges are laminated using three strips of  $\frac{1}{16}$ in. balsa  $\frac{1}{16}$ in. wide. The centre section is covered with  $\frac{1}{16}$ in. soft balsa top and bottom. The fin is cut to outline shape from  $\frac{1}{16}$ in. medium balsa, sanded to aerofoil section and cemented into a slot cut in the upper balsa covering. The trim tab is cut off and re-attached by means of a thin cellulose acetate strip to act as a hinge.

### Motor unit and cowling

All electrical connections are led from their components aft of the motor bulkhead to 6BA nuts and bolts on the bulkhead fitted with terminal tags, this prevents oil seepage back into the fuselage. The only exception is the HT lead, and on the original model this was led through an aluminium tube. A cowling improves the appearance and can be easily made as follows: having carved a wooden block to the shape required, this is rubbed with vaseline and thin strips of paper laid over it. Successive layers are stuck down with full strength dope and built

up until about  $\frac{1}{16}$  thick. A cowling made in this fashion is extremely strong, and will take a good finish, by sanding and dopping.

### Covering

The wing platform pieces that were cut out with the pylon top are let into the under-surface of each wing and the centre section top surface is covered with sheet balsa. Locating recesses and keys are cut in the top of the pylon and these hold the wing halves together, dowel pins and holes at the tailplane attachment serve as locators at that position.

On the original model the fuselage and fin were covered with Japanese tissue, doped with full-strength dope, while the wings and tailplane were double covered with the same material in red, water shrunk between coverings and given three coats of dope. The fuselage and fin were doped silver, finally protected by a coat of carefully brushed Chinese lacquer.

# Vintage Revival



THE "CLOUD-DOZER" BY R.V. BENTLEY

Full size dye-line copies of this two-sheet plan reproduced here to 1/7th scale are available from Aeromodeller Plans Service, Wolsey House, Wolsey Road, Hemel Hempstead, Herts. HP2 4SS, price £5.95 plus 60p p&p. Please quote Plan No. MA/8 when ordering.

## 1983 SMAE Spring Gala

The following account of this event has been compiled from information kindly submitted by Derek Ridley, who also provided his thoughts on various aspects of the vintage scene that are of current interest to modellers, especially his support for vintage glider, a branch of the hobby that has been rather neglected in the past!

"Despite the threat of inclement weather, which eventually proved correct and gave wind and intermittent rain for the day, a large contingent of hardy SAM 35 members travelled to RAF Odiham for this event. Like previous galas, the main competitions were for modern formula free flight and Vintage Wakefield, for which each consecutive year brings forth more enthusiasm. Vintage Wakefield are proving to be one of the most popular categories of model within SAM 35, even although no competitions are at present run for this class of model by the Society.

The Gala Vintage Wakefield was once again run under the kind auspices of Keith Miller, who specialises in taking action photographs of model flying. (Care to send some along Keith, to enliven V.C.? — Ed.) At the end of the first round Derek was in leading place after achieving the only max of the competition with a six and one half minute flight. However, in the second round, he dropped back to third place. Alan Wells now leading, followed by Peter Michel. The final round saw Alan Wells retain his leading position with his 'Gutteridge Trophy Winner', also Peter Michel flying his 'Isis' stayed in second place, but Derek was ousted from third place by Mike Kemp with his Swedish Blomgren model. Despite the weather, there were thermals around, but also large areas of sink with a capital 'S'. Vic Dubery's 'Judge' Wakefield found some of the latter, and everyone thought his model had DT'd, but the mushing flight profile was merely the glide in the subsiding air! Bob Copland presented the prizes to the first three place winners, this gesture being much appreciated. Many thanks, Bob."

Derek goes on, "Although previously stated, Wakefields and other rubber models are very popular, the Vintage Power model still reigns supreme and these were much in evidence at Odiham. Amongst those noted were: Don Knight's fast climbing HV 450 cabin model, Ken Tansley's Frog 45, Dave Baker's Firebrand and Mick Staples' Slicker, which was also very fast climbing, plus at least 30 more vintage power jobs all performing as expected. But vintage gliders were conspicuous by their absence. I am at present trying to promote this side of the

hobby and Odiham this year saw the first outing of my 10ft. span, Yeabsley Super Sunbug, helping the cause.

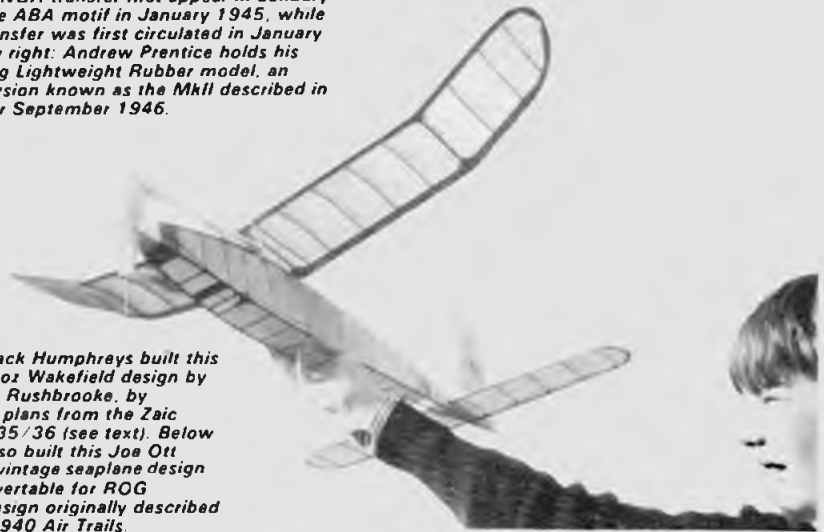
I am currently compiling a list of designs, plans and if there is sufficient response, intend to sponsor a vintage glider event in the near future. I would welcome constructive views on this type of contest. Still vintage model enthusiasm grows, and events like Odiham help to stimulate that growth. Whether 'Stick for Stick' or 'This is how I used to make them', don't let's kill this enthusiasm by setting rules. For how many modellers in those vintage days actually produced their models exactly like the plans or kits? Just remember the SAM 35 motto: "We fly for Fun!"

I presume that 'Stick for Stick' means true vintage replicas, while 'This is how I used to

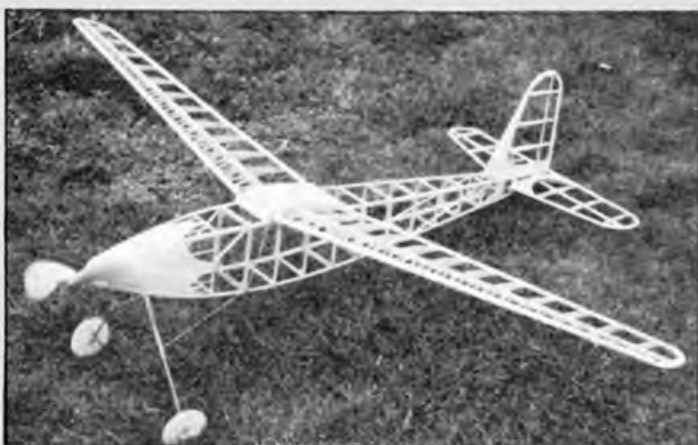
make them' opens up an avenue of almost unlimited modification. Derek is obviously a supporter of the (to my mind) mistaken idea that rules will kill enthusiasm. As to the amount of modification incorporated at the time when building from kits or plans, I admit that this did take place, but it was usually confined to quite minor aspects, and then only resorted to by a small number of modellers. As an example, if one was building a Slicker or Phantom, one tended to make it 'as per', since most modellers recognised and accepted Bill Dean's superior knowledge and experience. It is no secret that the major modification of established designs, embarked upon by inexperienced modellers, usually resulted in disaster! Unless the reins are held quite firmly, the 'This is how I used to make them' approach,



Above. Vintage period transfers for model aircraft. The NGA transfer first appear in January 1939 and the ABA motif in January 1945, while the NGM transfer was first circulated in January 1949. Below right: Andrew Prentice holds his Mick Farthing Lightweight Rubber model, an improved version known as the MkII described in *Aeromodeller* September 1946.



Below left: Jack Humphreys built this Mayfly II, a 4oz Wakefield design by C S 'Rushy' Rushbrooke, by enlarging the plans from the *Zaic Yearbook* 1935/36 (see text). Below right: Jack also built this Joe Ott Kingfisher, a vintage seaplane design which is convertible for ROG operation. Design originally described in February 1940 *Air Trails*.



can provide an umbrella for carte blanche changes that are not in keeping with vintage thinking.

## Names

In recent writings I have been misspelling Leon Shulman's name. This is my fault entirely and an error that I cannot blame on the typesetters! I venture to suggest that the family name was originally German and would have been written as Schulmann. Americanisation of German family names usually meant dropping the second 'n', hence my use of the name in this form. But I was wrong, Leon's forefathers obviously dropped the 'c' as well!

Before I am taken to task over the name of Gerry Ritz, this gentleman's name was originally Ritzenthaler when he wrote the

1936 Popular Aviation article to which I referred in June Vintage Corner. At a later date (possibly during the war) Gerry abbreviated his name to Ritz, and this is the name that I decided to use in all references to him when I compiled the passage on 'Aerofoil Sections'. In that article I am still misspelling Shulman's name, but in future will ensure that the 'c' is left out. Apologies to Leon Shulman and thanks to Peter Michel who brought the error to my attention.

## Transfers

Roy Hamilton from Reading raises an interesting point about the approximate introductory dates of the various transfers used on vintage models and a brief outline is given below that should be of interest to

modellers wishing to ensure that the appropriate vintage style transfer is applied to their handiwork.

**NGA . . .** The National Guild of Aero-Modellists. This £5,000 third party group insurance scheme was formed early in 1939. Members received a numbered certificate and four transfers of the black and gold insignia of the NGA which also sported the motto 'Vola cum cura' — Fly with care. Most transfers up to this time were applied image side down and the backing paper then rubbed away or peeled off, but the NGA transfers were of the new 'waterslide' type, not at all well known at the time and many were applied 'wrong side up' to the models. The number of cases of incorrect application caused detailed instructions on how to use the transfers to be given in the April 1939 *Aeromodeller*.

**NGM . . .** National Guild of Modellers. After the war there was a growing interest in power driven models other than aeroplanes, especially the model racing car which had a good following and late in 1948 the NGA became the NGM, since this seemed a more appropriate name to cater for model car operation as well as aeromodelling subjects. The change of name was obviously confusing for a period and members joining were still issued with NGA transfers until NGM transfers became available from about January 1949.

**ABA . . .** The Association of British Aeromodellers. Formed in mid-1944 to 'Promote, Encourage, Develop, Organise and Protect the Model Aeroplane Movement throughout the United Kingdom'. C. A. Rippon of Northern Heights was elected Chairman and this organisation went on to introduce National model aircraft competitions, which resulted in the exhibitions that were held at Dorland Hall during the winters of 1944, 1945 and 1946. The ABA also held some flying competitions, but these could not be recognised as official National events, since the SMAE held the authority for this purpose and understandably, friction between the two bodies developed! The attractive black and silver insignia of the ABA also appeared as waterslide transfers and these were seen affixed to models from the beginning of 1945.

Readers should still be able to purchase the large sheets of vintage decals that recently appeared on the market and these include examples of the above transfers. For those of you who have original transfers and are concerned with the brittleness that age brings to these, Roy Hamilton tells, "... I overcame the problem by spraying them with a polyurethane varnish aerosol before attempting to use them. This gave the



*Above: Canadian Modelcraft Hornet, a 1939 design powered by the Hornet 19 petrol engine, produced by John Morrill. This model was built by Bud McMorgan and is seen at Mile Square field, Los Angeles, California. Below left: Duncan Barr holds father Laurie's Vanstead. Note the feathering propeller and tailplane skid arrangement on this fine 1950 Wakefield design by E. W. Evans.*



*Below left: Devil Bat, 1950 stunt control line model designed by Laurie Glover and built by Ron Prentice. Below right: Ron also built this Quaker Flash from a Ben Buckle kit. Shown here with a Saito 40 four stroke, now replaced by PAW 19 diesel.*





# VINTAGE CORNER

transfers a high gloss, strong and flexible finish ... no trouble!".

## Readers' Letters

Jack Humphreys of Northampton, who has been building models for more years than he cares to remember, writes to tell us about two of his latest models. The first is *Mayfly II* designed by C. S. Rushbrooke, who was the secretary of the old Lancashire Model Aircraft Society and later editor of this magazine for many years. It was built from plans drawn up from the *Zaic 19:35:36 Yearbook*, is one of the old four ounce Wakefields and although now completed, Jack has only been able to indulge in two low power flights to date, but he says "... things look promising!".

The other model is the Joe Ott designed *Kingfisher*, which was described in February 1940 *Air Trails*. This is powered by a Merco 29 and while the model is currently a free flight machine, Jack may possibly fit two channel R. C. especially if he can get permission to fly the model off his local reservoir. This is an interesting model and the first of its type seen by the writer, its span in seaplane form is six feet, but, by removing the floats, fitting a wheeled undercarriage and omitting the 12in. span centre section, the landplane version spans only 5ft. Instead of building two wings, Jack has made his wing in three detachable parts, so can assemble it to the span required for either land or water operation. He goes on to say that his model is covered with nylon, the colours of which are not as the original model. The little kingfisher insignia on the fin was his daughter Diane's idea, who cut it out of a wild-life calendar and doped it on. Jack is still busy making compressed air motors and after his adventures with the three giant 'Tizer' bottles in series, has decided to go the 'whole hog' and his compressed air containers are currently of the original brass foil, wire bound, variety. We all know of the industry in the Humphreys' family for vintage models, but they will have to look to their laurels, since down in Somerset, Ron Prentice of Taunton also seems to have a prodigious appetite and is really churning them out. In a recent letter he tells of his fine flying Mick Farthing rubber model, shown in the attached photo held by his son Andrew, who is still smarting from the much publicised collision with Ron's Veco Chief control line model at Old Warden on last year's Vintage Day.

Ron goes on, "Laurie Glover's original Devil Bat had an ETA 29 in it but mine flies quite well with a Merco 29. The *Quaker Flash* was built from a Ben Buckle kit and although the all-moving tail sections per-

form OK, they are very sluggish and I would not use them again. I was fortunate to buy a Yulon 29 (1950) recently and am going to build a *Stunt King* from Brian Hewitt's original plans to fly at Old Warden this year. Have nearly finished a *Berkeley Brigadier* which will be powered by a Mills 1.3 Mk. I and controlled by a vintage Min-X Galloping Ghost radio which I have just bought from David Boddington. Hopefully, I'll be at the Nationals to take part in the competition for the Brigadier Trophy which I have presented to SAM 35 exclusively for this model."

As if this is not enough, Ron says that he is in the middle of building a Keil Kraft Kits *Falcon* for a Merco 61, a Vanstead Wakefield and a Mills .75 powered *Pinocchio!* For the benefit of younger readers, Ron is no newcomer to the game, he was one of this country's leading control line modellers in the late 1940s, winning the Open Stunt Event at the 1948 All-Herts Rally with his 28in. span Mills powered *Small Fry*.

## Spark ignition

It appears that interest in this type of power plant as a practical flying engine is not as high in UK as one would expect. Many power modellers here seem to prefer the diesel engine, possibly because a fair number of these are still around and can be

purchased reasonably cheaply. However, there is an attraction in reverting to spark ignition, as the fit and proper engine for the pre-diesel era, in fact the modeller of such early designs is missing a great deal of enjoyment by not getting involved with sparking plugs, ignition coils, timer points and the true sound and smell that only spark ignition can provide.

A recent letter from John Morrill of Simplex Miniature Engines, 143 Richmond Street, El Segundo, California 90245 tells that the original production batch of the Hornet 19 that I reviewed in the May 1982 *Vintage Corner* was sold rapidly and he has now undertaken to manufacture a second run, being currently almost half way through with that task. The price has risen slightly to US\$138.00 which at the present rate of exchange gives £89.00 as the UK cost. It might be possible to reduce this figure slightly if a number of engines are ordered, and in an attempt to gain advantage from this offer the writer is willing to hear from readers who are interested in buying one of John's Hornets. So those of you who missed first time round, if you want an excellent, brand new 19 sideport ignition engine that has a full spare parts back-up, drop John or myself a line. The engine is approved by SAM as an original ignition engine, and has a performance equivalent to a good Bantam or Arden of the same capacity.



Above, Mike Parrott of Bletchley built this Miss Delaware, an 37in. span Stephan Kowalik design which won the Junior Motors Trophy in 1936. Power here is a Merco 61, with Fleet R/C on three functions. Model reportedly a very pleasant flier. Below: a common sight at meetings in the immediate post-war era, many modellers travelled by bicycle or motorbike carrying their models thus! Who will be first to tell us who, where, when and identify the model?

Below John Morrill's Hornet 19 sideport ignition engine, production of which is well into the second batch - see text for details.



**NEW 1982-83 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 85p plus 30p p&p**

(Overseas accelerated surface post 65p)  
 Model & Allied Publications Ltd.,  
 PO Box 35, Wolsey House, Wolsey Road,  
 Hemel Hempstead, Herts. HP2 4SS  
 Delivery 21 days



To MODEL & ALLIED PUBLICATIONS LTD.  
 Sales Dept., PO Box 35, Wolsey House,  
 Wolsey Road, Hemel Hempstead, HP2 4SS

Please supply \_\_\_\_\_ copies of

Plans Handbook No. 1.

NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

1

# TELCO CO<sub>2</sub> POWER

## 3 COMPLETE SYSTEMS TO CHOOSE FROM -

**STANDARD MOTOR -**  
 Complete with 5 1/2" Propeller, Fuel Tank and Filler Nozzle, Charger Unit, Throttle Spanner, Thrust Wedge, Hardware Set, Decals, Full Instructions and One Soda Syphon CO2 Bulb.

S.R.P £10.95

**READY TO FILL-UP AND GO!**

**THE TURBOTANKS -**  
 For More Power/Duration  
 Complete, as above, but featuring an advanced design integral CO2 tank for easy, one-piece installation.

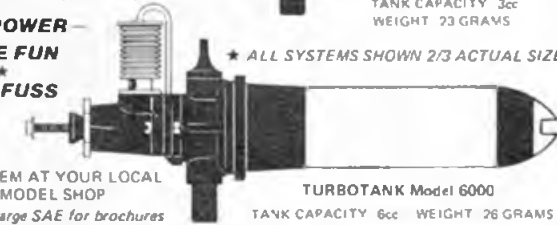
S.R.P £12.95 (TT3000)

S.R.P £14.45 (TT6000)

**CO2 POWER -**  
**MORE FUN**  
**LESS FUSS**

SEE THEM AT YOUR LOCAL MODEL SHOP  
 Or send large SAE for brochures

**FLY SAFE • FLY QUIET • FLY TELCO**



**TELCO SYSTEMS**  
 STATION ROAD • E. PRESTON • LITTLEHAMPTON • W. SUSSEX • BN16 3AG

**THE FIRST EVER**

# AERO JUMBLE

A gigantic outdoor 'Jumble Sale' of everything to do with aviation. Aircraft, gliders, micro's, models, parts, relics, radios, balloons, parachuting, books, photos, prints, paintings, clothing, films, videos, clubs, schools. There's never been anything like it before. It's for everyone interested in aircraft and flying.

**Saturday October 1st, 1983. 10am**

To book a stall ring (0935) 840565

Admission to Museum includes Aerojumble  
 £1.50 Adults,  
 75p OAP's and Children.

**Fleet Air Arm**

**MUSEUM AND CONCORDE**  
 R.N.A.S. Yeovilton, just off the A303 near Ilchester,  
 Somerset. Tel: (0935) 840565

# SUPER TIGRE

**WORLD'S No. 1 CHOICE FOR STUNT**

For those stunt enthusiasts wanting something larger than the G2146 stunt (a new batch which arrived at £33.64). We have made up a few ST60 stunt motors which at £44.57 is remarkably good value for ball-raced .60 and with a pedigree going back 20 years. It's a motor you just can't wear out and we have seen some very old ones of these still going strong. Like all Super Tigres we back this with a full spares stock and our free of labour charge irrespective of age or condition.



**ST60 STUNT £44.57**

**TIGRE ENGINES, UNIT 10 PARAMOUNT ESTATE,  
 SANDOWN ROAD, WATFORD, HERTS. WD2 4NV.  
 SAE WITH ALL ENQUIRIES**

**Be Quiet!**

Use an **EFFECTIVE** silencer

# DRAWING PLANS FOR SCALE MOD

**S**OONER OR LATER every scale modeller wishes to design his own model. The *Aeromodeller Plans Service* is large, but it cannot hope to cover the thousands of subjects that are suitable for flying scale. Even where the chosen subject is listed, it may be the wrong size, or inaccurate. In this case, the only solution is to draw your own plan. Many people with no drawing experience find this prospect daunting, but I hope to show in this article how straightforward the task is. Certainly the satisfaction of seeing the model fly is all the greater when it is an own-design.

The method of producing a working drawing is no different for a peanut than for an R/C model. There are differences however, in the aerodynamic requirements for the various modes of operation. For example control line models require little or no wing incidence relative to the tailplane, while in a free flight model, wing incidence is a vital factor and must be incorporated at the design stage. As I am a free flight scale modeller, my views will probably be biased in this direction.

The structure of the model must obviously be considered at the design stage. I would strongly recommend that you get a copy of the series by Eric Coates which appeared in *AEROMODELLER* from March 1971 to March 1972. Photocopies can be obtained from *AEROMODELLER* offices, price £1.50 per issue, and these give full coverage of modern outdoor free flight scale techniques. Failing that, get a copy of Eric's *APS DH9A* (plan FSP/1243, price £3.60 + 45p p&p) and follow that.

## Choice of subject

Selecting the subject is probably the hardest part. All scale modellers have a mental list of subjects they would like to build and this list changes constantly. Unfortunately a personal favourite is all too often totally unsuitable for free flight — mine for example is the SPAD, but it has flat wings and as I don't believe in putting dihedral where there should not be any, it will probably stay just an idea.

I do not intend to go into aerodynamics — again I would refer you to Eric Coates. However as this article is aimed at the beginner, I would advise choosing a subject with a basic square box fuselage and parallel chord wings. A square fuselage is easy to design since the cross sections can be plotted direct from the plan and side elevations. Most scale 3-view drawings have sparse cross-sections, and this makes the drawing of formers in a complex, rounded fuselage, much more difficult.

## Documentation

Having decided what to build, you must now set about collecting the necessary

information to produce the plan. Unless the model is intended for contest work, the extent of your documentation — and hence the accuracy and detailing of the finished aircraft — is entirely a matter of personal taste. Models can be produced using plastic kits, or even an Observer's Book of Aircraft silhouette as the sole reference. For some people, the collection of information becomes an end in itself and the model never gets built.

To produce an accurate model — possibly for contest use — you will need a reasonably good 3-view drawing and a handful of photographs taken from various angles, including at least one of the subject aircraft being modelled. This should clearly show the positioning of the markings. A direct side-view is also extremely useful.

Naturally, the best situation is where the actual aircraft can be inspected or photographed and a useful publication is the *Vintage Aircraft Directory*, compiled by G. Riley, price £1.25. Failing this, you will have to hunt around for what you need. The first place to look for a scale 3-view is, of course, the *Aeromodeller Plans Service* — *Plans Handbook No. 5*, price 85p + 30p p&p. There are over 400 types to choose from! By keeping an eye on the many full-size aviation magazines you will soon build up a useful portfolio of photos and drawings. The photograph libraries of the Imperial War Museum (which you can visit) and *Flight International* magazine are extensive, but there is quite a wait involved in getting copies.

Most, not all 3-views are inaccurate to a degree and here is where a good selection of photographs is essential. Before putting pencil to paper, spend some time comparing the two. Do the wings have the correct number of ribs and are the aileron proportions right? Does the fuselage shape look OK? Probably the most common area for error is in the fin rudder shape. De Havillands for example, often show variations in shape within the same aircraft type! If you have a direct side-view photograph, it is a simple matter to take a black and white shot of the relevant part and project the negative onto a piece of paper taped to a wall. When the size is right, draw around the outline. This method is also valuable for fuselage registrations which are very difficult to draw in the right proportions.

When I am drawing a plan, I find it very useful to have the photos stuck to the wall in front of me so that I can constantly refer to them, and correct any mistakes on the 3-view. Make notes of any discrepancies and, if it is a contest model, point out where you have followed the photographic evidence in your documentation folder.

## Drawing instruments

You need very little to set yourself up as an amateur draughtsman. Those drawing boards on stands with moveable straight edges on pulleys are very nice and I'd like one for Christmas, but in the meantime I make do with taping my sheet of paper to a table. I use large sheets of metric graph paper as the criss-cross pattern of lines at right angles to each other makes the marking of ribs and spacers, etc., very quick and accurate.

As for drawing implements, the first essential is a good 2ft. steel rule. Check that it is straight by drawing a line with it and then turn the rule over to see if the second edge matches the first. You will need a set square, compasses and dividers — the latter being a quick and easy way of cross-checking dimensions. Finally, unless you are building a Lacey, a set of french curves. For large radius curves as found on fuselages, it is best to pin down a length of  $\frac{1}{4}$ in. square balsa and draw around that, rather than attempt to use a french curve in several steps. I use H pencils since they do not blunt too quickly, yet can be rubbed out easily.

## Selecting the scale

Presumably you will have some idea of how big you want your model to be — probably to suit a particular engine. One consideration is whether the engine will fit the cowling at the scale used. The best of all engines for free flight scale is the Mills 1.3 but unfortunately the number of prototypes which can accommodate this tall motor is limited.

I prefer fairly large models as they generally fly better. For example I wanted my DH34 to be around 48-50 in. span. The full-size aircraft is 51ft., so a 50in. span model would be to a scale of  $51 \times 12 +$  or  $1/12$ th. Obviously the nearest scale to this is  $1/12$ th. There is no reason why you should not use any scale at all, so long as you have a calculator to work out the divisions on your scale rulers.

## Scaling up the drawing

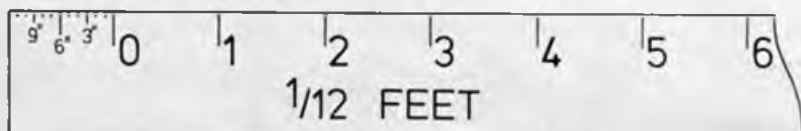
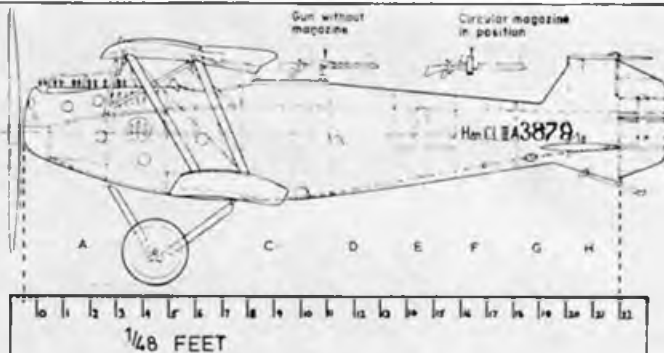
It seems to have taken me a long time to get this far, but perhaps that shows the importance of preparation. There are several ways of enlarging a three-view. The easiest, but also the most costly, is to have it blown up photographically. The drawback with this is that you can easily overlook glaring errors in the drawing since you have by-passed the close scrutiny necessary in the other methods. Alternative techniques are described in *'Flying Scale Models'* by Ron Moulton, but I am going to deal with one only — the two-scale rule method which I find quick, easy and accurate. Not only is this a good way of enlarging a 3-view, but by producing a pair of scale rules you can quickly check the accuracy of a published plan against a scale drawing.

The scale 3-view may be  $1/72$ ,  $1/48$ ,  $1/36$  or  $1/24$ th full size. If the scale is not stated, you will have to work it out by dividing the span on the drawing (in inches) into the span of the full-size (also in inches). Although this is the age of metric measurement, all the aeroplanes that interest me were built in feet and inches and their dimensions quoted as such!

You need two scale rules — one to suit the 3-view and one for the plan. I usually make the former from a strip of  $\frac{1}{8}$ in. ply about 1in. wide. By using such thin wood, parallax errors due to reading the scale at an angle

Aeromodeller

Fig. 1





are minimised. The rule is marked off with a hard pencil into divisions representing one foot on the scale drawing. For example, at 1/36th scale, one foot is represented by  $12 \div 36 = \frac{1}{3}$  in. The first division is subdivided into four segments representing 3in. each. At this scale, 1in. becomes very small and it is difficult to mark accurately, so it is best estimated within the 3in. division. Fig. 1 shows the correct marking — the fuselage length in this case measure 22ft. 5in.

The second scale rule, for the plan, can be made from thick card or similar. In fact it is often convenient with a large model to have two; a long one big enough for the largest dimension and a smaller, handier size for the smaller parts. With these two-scale rules, all dimensions taken from the 3-view and transferred to the plan are read in terms of the full-size measurements. The whole process is much easier to do than to describe and is quickly picked up.

I usually draw the fuselage first since all other components attach to it and it is also the most interesting part. The side view on your scale drawing should have an extra line — called the datum line — drawn on it, passing from nose to tail. This is the reference line from which all measurements are taken and then transferred to the equivalent datum on the plan. On some aircraft, like the BE2e, the datum passes along the top longeron and this makes things a bit easier. The datum is therefore the first line to be drawn and the most convenient measurement is the distance from nose to sternpost. The next step is to mark the positions of the major components on the datum of the 3-view. Using the set square, draw vertical lines from the wing and tail leading and trailing edges and then transfer these to the plan. Wherever possible, check each stage by measuring from nose and tail — any error will be very obvious.

Now the vertical positions of wings and tail can be fixed by measuring the distance of the leading and trailing edges above or below the datum. This is the time to check the incidences of the flying surfaces and 'fiddle' them if necessary. Ideally the wings should be at  $+3^\circ$  and the tail at  $0^\circ$ . Incidence is measured from a line drawn along the bottom of the airfoil section (Fig. 2).

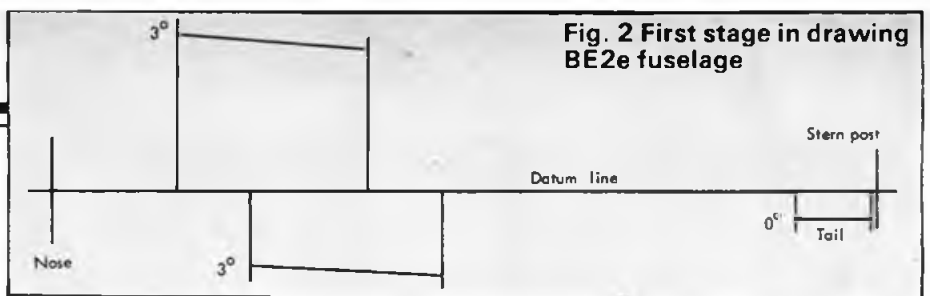
Next, the rest of the fuselage outline is developed. If, like the BE2e, it is all straight lines, then all you have to do is mark the position of each change of line along the datum and then fix its vertical location. With a curved fuselage you will need to mark off regular intervals — such as one scale foot — on each drawing and construct vertical lines to these. The more complex the curve, then the closer spaced the divisions will need to be for accuracy. All that remains now is to join the dots and see if the result looks anything like the real thing! (Fig. 3a).

The next step is to draw the fuselage plan view. Mark a second datum above and parallel to the first, after which it is easy to locate the wing and tail, etc., by continuing the vertical lines from the side view. Fuselage formers and strut and undercarriage positions can then be drawn in. (Fig. 3b).

At this stage it is worth pointing out how little constructional detail you need when designing for yourself as opposed to other people via publication. As long as you know in your mind how the construction will go, you can cut this kind of detail down to a minimum.

By the time you have finished the fuselage

August 1983



you should be well into the swing of things, and the wings and tail will be easy. The only thing likely to throw you is the rib positioning, since small errors can easily multiply and become very obvious. For this reason, take all sequential measurements from one point — like the wing root — rather than plotting each rib from its neighbour.

For a simple wing or tail tip, like the BE2e, carry the line of the tip to the leading edge and extended trailing edge, and measure from the tip to fix the angle (Fig. 4), finishing with correctly radiused curves. Here, another useful drawing implement is a stencil full of circular holes of increasing radius.

Fin and rudder shapes can be tricky. I usually develop the shape by continuing the rudder hinge line and then constructing vertical lines to this, rather like the fuselage on end (Fig. 5).

The last but very important part to draw is the markings and is also the most prone to error. If your documentation is up to scratch,

Otherwise it's back to trial and error until it looks right.

Your drawing will eventually be complete. Hopefully you have kept an eye on your photos throughout and not placed total trust in your 3-view, but rather treated it as a guide. Now is the time to give it a really critical look and cross check the major dimensions. In fact the best thing is to give the whole lot to a fellow scale modeller and get him to check it out with fresh eyes. It is better to find out your blunders now, when you can change them.

Finally, a word about documentation for contests. I have judged free flight, radio control and indoor scale models and as a universal rule, I would say that 90% of the documentations provided are awful. The judges have only so much time, so don't include too much. Three or four good photos are all you need unless it's the World Champs, but a typical documentation presentation goes something like this: a pile of books on Messerschmidt Bf109; of

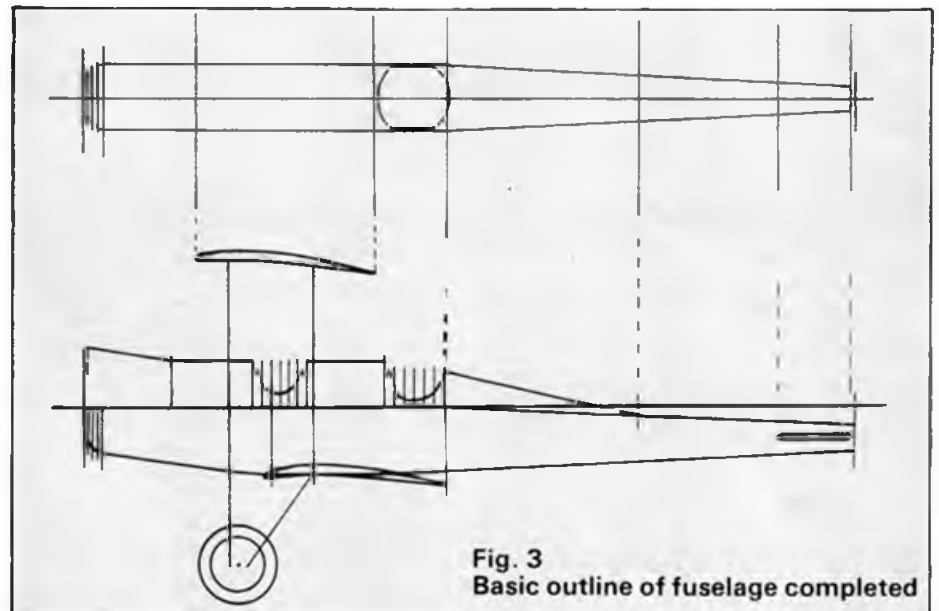


Fig. 3 Basic outline of fuselage completed

you will have enough information to do the job properly. It is surprising how many experienced scale modellers — especially R/C — build a model and then start looking for documentation to fit it!

Wing markings, especially roundels, are easily located by using ribs and aileron hinges as markers. Pay particular attention to how close roundels come to the wing leading and trailing edges. Wing strut attachment points are often visible on the upper surface and are another good reference.

Perhaps the most difficult markings are fuselage and fin registrations — so often they turn out too thin or thick, or in the wrong proportion. Again, a side view photo is of great value, enabling use of the enlargement method referred to earlier.



Fig. 5 Rudder shape

different marques with bits of paper to mark the relevant pages. The subject aircraft is the worst photo in the book, showing the aircraft furthest away in a squadron line-up. I've even been presented with a subject photograph showing a pile of wreckage of which the only recognisable parts were the elevators! These will be two or three large drawings and several loose pages designed to blow away in the wind.

In the age of the SLR camera, there is no reason why copies cannot be made of the relevant bits and pieces, and everything stuck down to a piece of thick card. Some of the best documentations accompany the rubber scale models from the Nottingham club at the Nationals. The extra effort put into this area will certainly pay off.

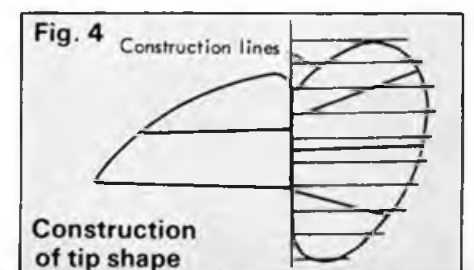


Fig. 4 Construction lines

Construction of tip shape

THE WORLD OF MODELS  
**LOVELY  
OAKHILL MANOR**

NEAR BATH



Large scale model SE5A Winner, Shuttleworth Trophy and Model Engineer Championship Cup

**A TREAT FOR ALL THE FAMILY**

The Ladies love the furnished mansion house and grounds

Ride on one of Europe's finest and most scenic miniature railways to the museum and see one of the world's finest private collections of transport models including some fine and important aircraft in a unique and beautiful setting.

'N' gauge railway - 'Railroading in the Rockies'

**NEW THIS SEASON — THE FINEST  
LOCOMOTIVE MODEL IN THE WORLD**

Free car park, picnic area, refreshment buffet, gift shop; eight acres gardens; 45 acres in all. Tel Oakhill 840210.

Entrance: A37 4 miles north of Shepton Mallet, turn at the Mendip Inn  
OPEN: every day 12 noon to 6 p.m. (including week ends) 31st March to 31st October  
High in the Mendip Hills close to Wells, Glastonbury, Cheddar Gorge and Cranmore

Have fun with a  
**DPR MODEL**  
in the

**1983  
SUPERGLOY  
CHUCKIE CHAMPIONSHIP**



**D.P.R. MODELS — LOOKING AFTER TOMORROW'S MODELLERS TODAY!**

Have you qualified yet for the National Supergloy Chuckie Championship Finals, to be held at Middleton Hall, Milton Keynes on the 16th October, 1983?

If you are under 13 years old, bring your D.P.R. 'Chuckie' to Plumpton Race Course on August 20th - 21st or to the British National Championships at R.A.F. Barkston Heath on August 27th - 28th - 29th. Alternatively, we will show you how to build a 'Chuckie' in our 'Junior Workshop' on site — Competition heats each day with super prizes for the best flights!

For further details write to D.P.R. Models, Unit 9, The Vanguards, Shoeburyness, Essex



**HIGH PERFORMANCE MODELS  
EASY TO BUILD AND FLY**

**DEVCON**

**"Dev-Tube"**



The two-part dispenser that 'thinks' for itself and automatically ejects exactly balanced proportions of resin and hardener simply by pressing the Siamese plunger. Nothing could be simpler — or more accurate.

5 min DEV TUBE £1.32  
30 min DEV TUBE £1.22

YOU SAVE MONEY when you buy DEVCON EPOXY — just compare the price with other makes. And the Devcon name is your automatic guarantee of HIGH QUALITY. Other products include GENERAL PURPOSE PASTE (£1.28) and FAST CURE PASTE (£1.86). BEST BUYS AVAILABLE AT ALL RIPMAX STOCKISTS.

5-MIN CLEAR Epoxy is also available in twin packs for general use in three economic sizes  
28g £1.22, 70g £2.11 and 252g super economy at £3.95.



**Model of "Days Gone" by Lledo**

- DG1 London Open Sided Horse Drawn Tram Car
  - DG2 Horse Drawn "Express Dairy" Van
  - DG3 Horse Drawn "Windmill Bakery" Van
  - DG4 Horse Drawn London Open Top Double Deck Bus
  - DG5 Horse Drawn London Fire Brigade
  - DG6 Orange Model T Ford "Ovaltine"
- SRP £1.49 — TRADE SUPPLIES EX-STOCK

JOHN AYREY DIE CASTS, John Peels Mill, Northgate, BAILDON, West Yorks, BD17 6JY. • (0274) 594119

Available from your local dealer

On display at the showrooms

BARCLAYCARD  
VISA

THE Balsa Tree

16-18 HOWE STREET, DERBY.

'Phone 46579 (0332)

OPEN 0900 — 2000 DAILY  
BUY TUES. 1600 - 2000

MAIL ORDER

THE BEST SELECTIONS OF THE BEST Balsa FOR YOUR PERSONAL NEEDS  
95% OF THE SOLARBO RANGE ALWAYS IN STOCK

ENGINES by:  
CONDOR  
IRVINE  
WEBRA  
O.S.  
MERCOC  
P.A.W.  
FOX  
D.C.  
T.T.  
G-MARK

RADIOS by:  
SANWA  
WEBRA -

TOOLS  
BOOKS  
DATA  
ETC.

Some T.B.T. Specials:  
1/2" wing seating tape £5/25mtr. roll  
1" x 1" servo tape £12/500 tabs.  
1" x 1/2" servo tape £11/1,000 tabs.  
SATURN: solo, skippy, saluki, starlet.  
95p — £2.95

KITS by:  
VERON  
PILOT  
SATURN  
KK  
GUILLOWS  
MERCURY

ACCESSORIES by:  
KAVAN  
SLEC  
RADIOACTIVE

'COPTERS by:  
HIROBO & SCHLUTER

SATURN "SKY DANCER"  
in Stock + Spares  
for the older ones!  
ONLY £34.50  
and it's all in the box!

SULLIVAN  
ROBART  
DELUX  
PECK-  
POLYMERS  
HUMBROL  
MIDWEST  
Etc.

NO BULL - NO PRESSURE SELLING - IT'S OUR HOBBY TOO!!!  
INFO., HELP, ADVICE ANY TIME, BUILDING SERVICE TOO!!!  
HOPE TO SEE YOU SOON! - CHRIS.

# FUTABA RELIABILITY

**ATA  
FANTASTIC  
LOW  
PRICE**

## Medallion 2

Quite definitely a BEST BUY in 2-channel radio. After all, Futaba are world leaders in digital proportional radio control — which means the same high technology incorporated in MEDALLION 2 as much more expensive sets. Futaba PERFORMANCE and QUALITY — as well as outstanding reliability. Check at your local model shop today how little it costs to become a Futaba owner!



**AT RIPMAX STOCKISTS**

**DAV = CAL**

LIMITED

HILL'S MEADOW, DOUGLAS, ISLE OF MAN.  
Tel: (0624) 4224

### QUICKSTART PRODUCTS

Engine Name	Capacity	Type	Mount	Aero Std	Aero R/C	Marine Std	Marine R/C
DART	0.5cc	Diesel	Beam	£13.30	—	£16.88	—
MERLIN	0.75c.c.	Diesel	Beam	£12.20	£16.90	£15.09	£19.69
SPITFIRE	1.0c.c.	Diesel	Beam	£13.60	£18.20	£16.93	£21.53
SABRE	1.5c.c.	Diesel	Beam	£13.99	£18.75	£17.50	£22.10
RAPIER	2.5c.c.	Diesel	Beam	£29.95	£34.55	£35.00	£39.00
WASP	0.049	Glow	Beam	£9.67	£14.27	£12.28	£16.88
BEE	0.049	Glow	Radial	£12.21	£16.81	—	—

#### GENERAL ACCESSORIES

Engine Test Stand (Cast) 3.5c.c. Max.	£4.14
Engine Test Stand (Machined) 10c.c. Max	£8.50
Adjustable Control Line Handle, Metal (Spike)	£2.87
Adjustable Control Line Handle, Metal	£2.87
Quickclip Connector with Lead and Plug	£2.04
Quickclip Connector (Only)	£1.10
G16 Short Reach Glow Plug	£1.01

OFFICIAL SERVICE AGENT.

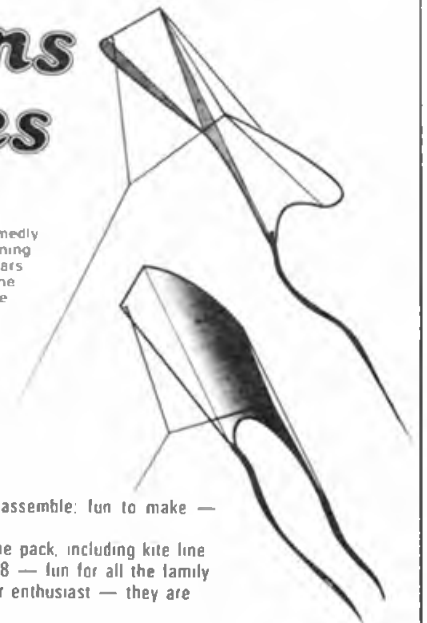
#### SILENCERS

Dart Silencer	£3.80
Merlin Silencer	£1.90
Spitfire Silencer	£2.00
Sabre Silencer	£2.00
Wasp Silencer	£3.80
Bee Slinger	£3.80

FOX MANUFACTURING CO.  
(U.K.), THE HAVEN, RIXEY  
PARK, CHUDLEIGH,  
NEWTON ABBOT, DEVON  
TQ13 0AN.

## Greens Kites

CLOUD HOPPERS are unashamedly designed for pleasure. The stunning 3 dimensional kits have no spars and the special properties of the plastic give a long lasting, trouble free lift. CLOUD HOPPERS give maximum fun with minimum fuss.



- takes about 5 minutes to assemble: fun to make — foolproof instructions
- everything you need is in the pack, including kite line
- suitable for all ages above 8 — fun for all the family
- can be flown by beginner or enthusiast — they are enjoyable addictive
- stores flat when not in use
- bright, clear design and sturdy safe construction

For further details of CLOUD HOPPERS and our rip stop nylon kites write to Greens of Burnley  
\*TRADERS — for wholesale details and a FREE SAMPLE of a CLOUD HOPPER write to Greens of Burnley on your official stationary.

**GREENS KITES, GREENS OF BURNLEY,  
336 COLNE ROAD, BURNLEY, LANCS. Tel: (0282) 39650**

## MODEL SHOW PLUMPTON RACE COURSE

JOHN BLACKMAN,  
SHOW MANAGER,  
44 WILSON ROAD,  
TUNBRIDGE,  
KENT.  
Tel: Tonbridge 351738

10 MILES FROM BRIGHTON, SUSSEX  
**AUGUST 20-21**

RADIO CONTROLLED **300 mph DUTCH JETS**

AEROPLANES (PRE-ENTRY) · CARS · HELICOPTERS · BOATS · MODEL ROCKETS  
MICRO LIGHT AIRCRAFT · LIVE STEAM TRAINS · TRACTION ENGINES · HELI-  
COPTER RIDES · PROPER TOILETS · CARAVAN · TENT · CAR AND FAMILY  
COME FRIDAY STAY TILL MONDAY £10 THE LOT IF PRE-BOOKED

Please make cheques — money orders payable to MODEL SHOW and send, with any queries to  
Dave Bishop, D B. Sound, 17 The Square, Tatsfield, Kent. Tel: Tatsfield 550.

## FORMBY MODEL & HOBBY CENTRE

THE BIG NAME IN THE MODEL WORLD

BUILDING THE 5th REVOLUTION COMBAT MODEL?  
Free plan in this issue.

Then for peak performance you need a P.A.W. DS19 (3½cc)  
PRICE £14.95; SILENCER SET £4.03; MUFFLER SET £1.38.



We stock all P.A.W. engines and spares, plus a wide range of control-line kits and accessories.  
We also specialise in Keil-Kraft and Guillows, gliders, free-flight and rubber powered kits.

Mail order a pleasure — Access and Barclaycard accepted. Please add 75p p&p on engines. 7 days delivery.

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



# Model Shop DIRECTORY

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.

## LANCASHIRE

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

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

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

## NORFOLK

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

## AUSTRALIA

**MELBOURNE 3000** Tel (347)  
RIVERSIDE HOBBY CENTRE 8029  
16 LITTLE LATROBE STREET \*  
9 am-5.30 pm Mon - Fri  
9 am-12 noon Sat

## ESSEX

**CHELMSFORD** Tel (0245)  
CHELMSFORD 352553  
MODEL CO LTD  
204 MOULSHAM STREET  
Mon, Tues, Wed, Thurs & Sat  
9.5.30 Fri late night 9-7.30

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

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

## BERKSHIRE

**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

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

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

## NORTHANTS

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

## CAMBRIDGESHIRE

**CAMBRIDGE** Tel (0223) 59620  
MODEL MANIA \*  
17 KING STREET  
Open 9.30 am-5.30 pm  
Mon - Sat Inc. Lunchtime

## HAMPSHIRE

**FAREHAM** Tel (0329) 234136  
G M H BUNCE & CO LTD \*  
206 WEST STREET  
Open 9 am-5.30 pm. Closed Wed

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

## NOTTINGHAMSHIRE

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

## CHESHIRE

**MACCLESFIELD** Tel (0625)  
HOBBYCRAFTS 29467  
(MACCLESFIELD) LTD  
PARK MILL  
HOBSON STREET  
Open 9.30-5.30 Mon - Sat

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

## LEICESTERSHIRE

**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

**NOTTINGHAM** Tel (0602)  
NOTTINGHAM 412407  
MODEL CENTRE \*  
85 MANSFIELD ROAD  
Open Mon - Sat 9.00-5.30 pm  
including lunchtime

## CHESHIRE

**SALE** Tel (061 962) 4561  
HOBBYWORLD \*  
200A MARSLAND ROAD  
Mon - Sat 9.30-6.00  
Wed. early closing

## HERTFORDSHIRE

**ROYSTON** Tel (0763) 45375  
MODEL WORKSHOP \*  
31 KNEESWORTH STREET  
SG8 5AB  
Open Tues - Sat 9.30 am-6.00 pm  
Late night Friday 9.30 am-8.00 pm

## LONDON

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

## OXFORDSHIRE

**OXFORD** Tel (0865) 42407  
HOWES OF OXFORD \*  
9-10 BROAD STREET OX1 3AJ  
Open 9.00 am-5.15 pm  
6 day week

## CLEVELAND

**MIDDLESBROUGH** Tel (0642)  
HOBBYDROME 211212  
283 LINTHORPE ROAD  
Open 9.30 am-5.45 pm  
Late night Friday 8 pm  
Closed Wed

## HONG KONG

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

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

## SCOTLAND

**GLASGOW** Tel (041 221) 0484  
DUNNS MODELS \*  
3 WEST NILE STREET  
Open Mon - Sat 9.00 am-5.30 pm

## DERBYSHIRE

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

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

**LONDON** Tel (01-228) 6319  
E F RUSS  
BATTERSEA RISE SW11  
Open 9 a.m. - 6 p.m.  
Early closing Wednesday 1 p.m.

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

## DEVON

**PLYMOUTH** Tel (0752) 263133  
RUNWAY SOUTHWEST \*  
22 FRANKFORT GATE  
CITY CENTRE  
Mon - Sat 9 am-6 pm  
Late night Friday 8 pm

## KENT

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

**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

## STAFFORDSHIRE

**STAFFORD** Tel (0782) 3420  
JOHN W BAGNALL LTD \*  
18 SALTER STREET  
9 am-5.30 pm  
Closed all day Wednesday

**TORBAY** Tel (0803) 521767  
MANSEL S MODELS \*  
PALACE AVENUE PAIGNTON  
Open 9.15 am-5.30 pm Mon to  
Sat inclusive. Half day Wed  
Late night Fri 7 pm

**TUNBRIDGE WELLS** Tel (0892)  
BALLARDS 31803  
54 GROSVENOR ROAD \*  
Open Mon - Sat 9.00-5.30  
Wednesday 9.30-12.30

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

**WOLVERHAMPTON** Tel (0902)  
WOLVERHAMPTON 26709  
MODELS & HOBBIES \*  
BELL ST. MANDERS CENTRE  
9 am-5.30 pm Mon - Sat  
Early closing Thursday

## DORSET

**BOURNEMOUTH** Tel (0202)  
R F AUSTIN - MODEL 424038  
SHOP, 156 SEABOURNE ROAD \*  
SOUTHBOURNE BH5 2JA  
Open 9 am 5.30 pm Mon, Sat  
Closed 6pm Thurs - Fri. Half day Wed

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

## MIDDLESEX

**HARLINGTON** Tel 01-897  
RADIO CONTROL MODEL 2326  
CENTRE 214 HIGH STREET \*  
Mon, Tues, Thurs & Sat 9.15 am-  
5.30 pm, Fri 9.15 am-6.30 pm  
Closed Wednesday

## SUFFOLK

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

**WEST MIDLANDS**

**SUDBURY** Tel (0787) 76825  
THE MODEL CENTRE \*  
57 STATION ROAD CO10 6SP  
Mon Tues 10 15am 5 30pm  
Thurs Fri Sat 9 15am 5 30pm  
Closed 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

**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 CUTTRISS & SONS  
40 DUKE STREET  
Open 9 am-5 30 pm  
Closed all day Thursday

**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

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

**BIRMINGHAM** Tel (021 373)  
5945 3535  
JIM DAVIS MODELS  
311 313 MARSH LANE  
ERDINGTON  
Mon Sat 9 30 am-6 30 pm

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

**TYNE AND WEAR**

**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

**NEWCASTLE UPON TYNE**  
Tel (0632) 322016  
THE MODEL SHOP \*  
18 BLENHEIM STREET  
Mon-Fri 9 am-5 30 pm  
Sat 9 am-6 pm

**SOLIHUL** Tel (021 744) 3374  
SHIRLEY MODEL SUPPLIES \*  
62 STRATFORD ROAD  
Open Tues-Sat 9 am-3 pm &  
4-6 pm Late night Thurs 8 pm

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

**WALES**

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

**CARDIFF** Tel (0222) 31367  
THE CARDIFF MODEL CENTRE \*  
34 LLANDAFF ROAD  
CANTON, CARDIFF  
Open 9 30-5 30 six days a week  
Late closing Friday 7 00 pm

**MELKSHAM** Tel (0225) 703311  
MELKSHAM MODELS  
19 BATH ROAD  
Mon, Tues and Thurs 9 am-  
5 30 pm. Wed closed all day Fri  
9 am-6 30 pm Sat 9 am-5 pm

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

**SUSSEX**

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

**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

**YORKSHIRE**

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

**YORK** Tel (0904) 34281  
DAVE SMITH MODELS \*  
17 DAVYGATE CENTRE  
DAVYGATE  
Open Mon-Sat 9 am 6 pm  
No half day

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

**NEWPORT** Tel (0633) 65061  
MAKE A MODEL  
123 COMMERCIAL STREET  
Mon to Sat 9 am-5 30 pm  
Thursday closed all day

**BRADFORD 8** Tel (0274) 726186  
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 mail order are  
denoted by an asterisk



**CLASSIFIED**

Private and trade rate 18p per word; minimum £3.50. Box Numbers £1 extra. Display box rate £4 per single column centimetre (minimum size 2.5cm, maximum 5cm). All advertisements are inserted in the first available issue, unless specified otherwise. Box replies to be sent care of Advertisement Department, Model & Allied Publications Ltd. Write your advert in **BLOCK CAPITALS** in the grid below, ticking the section you wish it to appear under, **INCLUDING YOUR NAME AND ADDRESS IN THE WORD COUNT** and send it to: **AEROMODELLER, ADVERTISEMENT DEPARTMENT, P.O. BOX 35, WOLSEY HOUSE, WOLSEY ROAD, HEMEL HEMPSTEAD, HERTS. HP2 4SS.**

- FOR SALE     WANTED     GENERAL     SERVICES     BOOKS & PUBLICATIONS


**advertisements**

ALL CLASSIFIED ADVERTISEMENTS MUST BE PRE-PAID. THERE ARE NO REIMBURSEMENTS FOR CANCELLATIONS.  
I enclose my Cheque/Postal Order\* for £\_\_\_\_\_ for \_\_\_\_\_ insertions, made payable to Model & Allied Publications Ltd.  
(\*Delete as necessary)

Name .....

Address .....

Post Code .....

Signature ..... Date .....



IF YOU DO NOT WISH TO CUT YOUR MAGAZINE PHOTOCOPY THIS FORM

# CLASSIFIED advertisements

All classified Advertisements must be pre-paid

Private and trade rate 18p per word minimum £3.50 Box numbers £1 00 extra Display box rate £4 00 per single column centimetre minimum 2.5cm, 5cm. All Advertisements are inserted in the first available issue. Box Replies to be sent care of Advertising Department, PO Box 35, Wolsey Road, Hemel Hempstead, Herts., England, HP2 4SS. There are no reimbursements for cancellations

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.

## For Sale

Two ED Super Racer R C £12 each DC Rapier £6, DC Rapier R C £8 2 Merlin Sabre, Wasp, Dart, Frog 049 Glow £6 each Cox, TD 010 £10, 3 Pee Wee, Babe Bee £6 each P Williamson, 4 Viking Close, Ballakillowey, Colby, Isle of Man W

For sale. General arrangement drawings of wide range of aeroplane types Saunders Kittiwake to Parnell Pixie, WWI, Schneider Trophy Seaplanes, various scales; some rubber-powered. Send for free lists. John Sizer, 69 The Avenue, Lowestoft, East Suffolk, NR33 7LH W

106 Aeromodellers and Model Aircraft 1950-1980 Offers SAE list Everitt, 7 Newark Drive, Mansfield, Notts. W

Small lathes, millers bought sold Selection Myfords, Boxfords, etc. usually available Tony Griffiths, Tel Buxton (Derbys) 871633 W

# tmd

the modellers' den  
SMALL SCALE SERVICE

We continue to supply all your 'Small Scale' items including Peck Polymer Kits and Accessories, Flying Kits, RN 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. AM8  
2 Lower Borough Walls, Bath  
Phone 0225 60115 Avon BA1 1QR

## 'ARDEN' PROPULSION UNIT

The handy silent, efficient propulsion system £5.99

Pirelli Size mm 43g park 10cm Packs Machine  
Rubber 6 x 1 £1.76 Stripped £1.95 ea  
Aero 4.5 x 1 £1.87 08-1 1 x 1  
Strip 3 x 1 £2.07 15-1 2 x 1

PACKING AND UK POSTAGE FREE  
G KNIGHT ENGINEERING

Foden Cottage, Finchdean, Portsmouth.  
PO8 0AU

## MODEL WORKSHOP

Aircraft, boats and cars

Good supplies of balsa wood, plywood, spruce, mahogany, tissue, banana oil, rubber, etc Futaba radios and OS Engines

10% off list price. Help and advice  
31 Kneesworth Street, Royston,  
Herts. Tel: (0763) 45375

FALKLANDS TASK FORCE  
SPITFIRE, VICKERS GUNBUS,  
BA146, CONCORDE  
PLUS MANY OTHER QUALITY  
FRAMED PICTURES AND  
PICTURE CLOCKS

Send SAE for colour leaflet and full lists to

CALL SIGN AVIATION  
9 Southfield, Welwyn Garden City,  
Herts. Tel: (07073) 20241

## INDOOR MODEL SUPPLIES

INC MICRO-X-PECK POLYMER  
F.A.I. MODEL SUPPLY I.M.S.

Stocks of Ambroid Glue, Pirelli, F.A.I. Rubber (hank or stripped) Brown CO, Hungerford Silk Wheels, Ball Bearing Races, Carbon-fibre, Indoor Books, etc

Send long SAE for latest list and prices

## SAMS

2 The Drive, Blackmore End,  
Wheatthampstead, Herts.  
Tel: Kimpton (0438) 832011  
Mon to Fri. 6-10 p.m. - No Callers

## AEROGRAPHICS "AUSTER J4" 23 span

This popular British lightplane is now available in plan form to join the D.H. Tiger Moth and Gypsy Moth (20") in the Aero graphic range. CO, rubber powered. These accurate two sheet plans are only £1 50 each, postage free. More designs to follow  
Aerographics, 43 Chamberlain Road,  
Chippenham, Wilts. SN14 0TF

For sale - Aeromodellers 1943-80, Model Aircraft 1949-65, annuals, catalogues, books (all early) Wanted - pre-1939 Aeromodellers to complete collection SAE for lists - 28 Shelley Avenue, Wincham, Northwich, Cheshire W

## General

We are the officially approved service agents for Austro-Webra, Cox, Davies Charlton, Enya, Fox, Fuji, HB, HGK, HP, Kavan, ME, Merco, PAW, Thunder Tiger. Retail dealers for OS Irvine, ED, G-Mark. May we estimate for spares, accessories, repairs, overhauls, new motors, part exchanges? For express delivery quote your Access or Barclaycard number John D Haytree, The Haven, Rixey Park, Chudleigh, Devon, TQ13 0AN Tel (0626) 852330 Callers by appointment please T C

Engine Repair service, repro parts, rebore, etc Send engine or details (SAE) for quote. Engines and parts wanted, any condition P Mason, 186 Hutton Road, Bedford, Middx UVWX

## MODEL AIRCRAFT BUSINESS FOR SALE

Design rights, manufacturing jigs, packaging and sundry items, for a popular range of control-line and free-flight kits.

Box No. 1032  
c/o Aero Modeller,  
Wolsey House, Wolsey Road,  
Hemel Hempstead, Herts.  
HP2 4SS.

Interested in 1930's Dinky Toy aeroplanes? Then visit the Vintage Toy and Train Museum, Field's Market Place, Sidmouth, Devon STUVWXY

## Books & Publications

New and secondhand books on aviation, military and naval subjects. Free lists from Athena Books, 20 St Mary's Road, Doncaster DN1 2NP. Separate list of magazines on request, includes Flying Review, Air News, Air Pictorial, Profile aircraft series W

"Making Scale Model Airplanes Fly." Selecting, improving, constructing, flying trouble shooting all types. Widely recommended book. More information in June-July 1982 advertisements \$7.95 (surface). Aircraft, Data, Box 32021-A Dallas, Texas 75224 USA UWY

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

## Wanted

Wanted, Veco 35 std, also K&B Stallion 35 std. Must be in good condition. Please phone South Shields 569155 after 7.00pm W

Wanted - 'Skybird' aircraft, figures, accessories, catalogues, literature. Also 'Flybird' items. 4 Durrington Park Road, Wimbledon, London SW20 8NX W

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

'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 (\$17 00) for a year's subscription to British Gliding Association, Kimberley House, Vaughan Way, Leicester, England T C

AMERICAN  
AERO-MODELLING MAGS  
R C Modeller press inc postage £2 50  
M A N £2 20  
Flying Models £1 65  
Scale R C Modeller £2 20  
Model Builder £2 35  
Current and some back issues available  
THE AVIATION BOOKSHOP  
656 Holloway Road, London N19 3PD

## Gliding

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

Gliding course from May Oct. B.G.A fully rated instructors - fine soaring - lovely coastal airfield - ideal for a different family holiday

The Course Secretary, Tremearne, Breage, Helston, Cornwall  
Tel: Helston 62294

## 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

## FLY A GLIDER

TRY A GLIDING HOLIDAY  
Residential clubhouse - bar professional instructor, launches by aerotow or winch. Three two seaters and Falke motor glider available.

Write to Holiday Manager, Dept AM Bristol & Glos Gliding Club, Nympsfield, Stonehouse, Glos GL10 3TX Tel: Dursley (0453) 860342

## 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  
Tel: Shoreham by Sea 61616

## TRY IT FOR REAL

Take your holiday gliding course with the YORKSHIRE GLIDING CLUB. Fully residential Clubhouse with licensed bar full time professional instructors. Three tugs. Winet Glassfibre R21 two seaters Falke motor glider. Hill thermal and wave soaring. Courses April to October. For details contact

The Secretary, Yorkshire Gliding Club, Sulton Bank, Thirsk, Yorks  
Tel: Thirsk (0845) 597237



Great value in Radio Control!

# SANWA CLUB FM2

Cheap and cheerful is what most two-channel R/C systems are about — pretty basic stuff at a basic price. But take a look at the new SANWA CLUB FM2 and see what it has to offer. Like for instance, the transmitter reversing switches for both control functions, the output meter and LED indication, plug-in crystals and changeable neutral position on the left-hand stick.

SANWA CLUB FM2 suits either dry battery or rechargeable nicad operation and offers you all these features at a price that will really make you cheerful!

**SANWA CLUB FM2 £59.95\***

**SANWA CLUB FM3 £65.95\***

Nicad conversion kit £29.95 with charger  
Extra Servo (Sanwa S394) £13.95

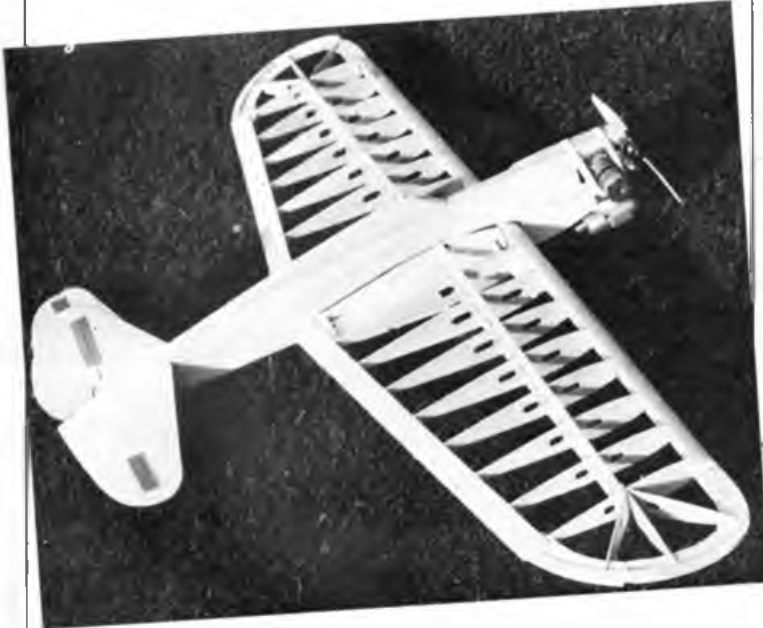
*\*Denotes price as supplied for dry battery operation.*



**IRVINE ENGINES LTD.** Tel: 01-361 1123/4      **IRVINE**            **SANWA**  
 UNIT 2, BRUNSWICK INDUSTRIAL PARK, BRUNSWICK WAY, NEW SOUTHGATE, LONDON N11 1JL

# IF IT FLIES, IT FLIES BETTER WITH SOLARFILM

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

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

# THE SILENT REVOLUTION

**NO NOISE  
NO MESS  
NO STARTING  
TROUBLES**

**JUST  
SWITCH ON  
AND FLY!**

- ★ Finished parts — ready for assembly
- ★ Both kits include electric motor
- ★ Reduction gearbox and propeller



**SIROCCO**  
Span 61in. Length 33in.  
**CESSNA**  
Span 43in. Length 30in.  
Both for two channel operation



**ELECTRIC FLIGHT PACK**  
Convert your own model to electric flight. All necessary parts including propeller. Except for NiCad battery.  
**ON/OFF RELAY**  
Gives motor control, requires one extra channel but no extra servo. Plugs into receiver.



**ACOMS 235/335 AM**  
New 2 to 2 + 1 sets  
with lightweight mini  
receiver — 24 gms.

SEE THEM AT  
YOUR LOCAL  
MODEL SHOP

**RIKO**

**RICHARD KOHNSTAM LIMITED**

13-15a High Street, Hemel Hempstead, Herts.

**acomms**  
RADIO CONTROL SYSTEM