October 1973

Aero Modeller

MAP HOBBY MAGAZINE

INCORPORATING MODEL AIRCRAFT

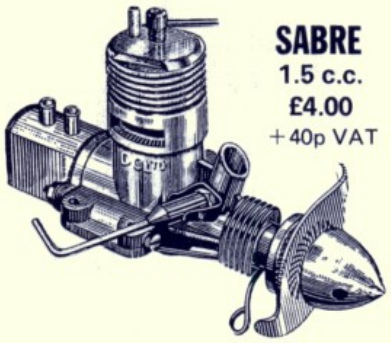
20p USA & Canada $1

WORLD FREE-FLIGHT CHAMPIONSHIPS REPORT

NATIONALS COMBAT WINNER

TEAM RACE TIPS

DART
.5 c.c.
£4.00
+40p VAT



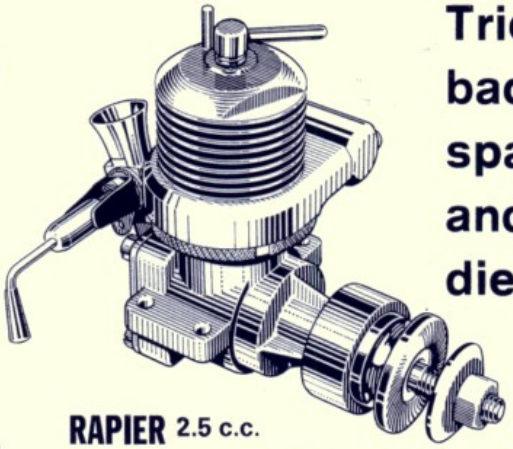
SABRE
1.5 c.c.
£4.00
+40p VAT

WASP
.049 c.c.
£2.35
+24p VAT

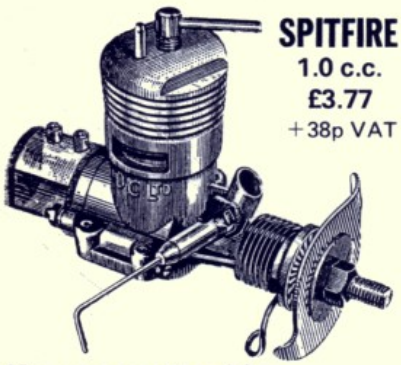
See them at your model shop!

QUICKSTART

The Motors for the Modern Modeller! Quality engineered for lasting performance



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

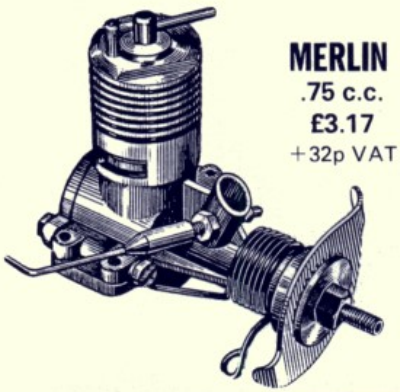


SPITFIRE
1.0 c.c.
£3.77
+38p VAT

RAPIER 2.5 c.c.

Std Aero	£8.25 +	83p VAT
R/C Aero	£9.50 +	95p VAT
Std Marine	£10.50 +	£1.05 VAT
R/C Marine	£11.75 +	£1.18 VAT

SUPER MERLIN
.75 c.c.
£3.47
+35p VAT



MERLIN
.75 c.c.
£3.17
+32p VAT

No spares-backing worries – if you have a Quickstart you can be sure of full and continuous use of your engine

Quality
Reliability
Economy

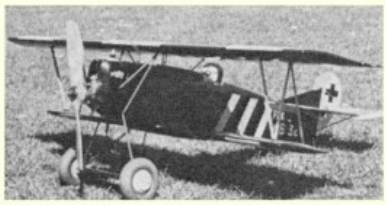
DAVIES-CHARLTON LTD. HILLS MEADOW DOUGLAS, Isle of Man

SOLARBO

Photo: Dave Hughes

They really do make 'em realistic these days! Given a good camera (and a good photographer), it's often difficult to tell the difference between a flying scale model and the real thing from a pic. Like these couple of Pitt's Specials. (Models, of course, unless they are giant size cars in the background!

Scale models did not used to be so realistic. The Fokker D7 in the small pic. below is obviously a model. With a balsa pilot! Modelmakers' skills have advanced tremendously.



New materials have been exploited, too. But the *basic* aeromodelling material remains the same – Balsa. And just as you need a good camera for outstanding pics., you need good Balsa for outstanding results. Unlike cameras, you *can* afford the best in Balsa. Simply specify Solarbo every time. Then, like photography, the ultimate results can truly reflect your skills and abilities.

THE HOME OF GOOD BALSA

SOLARBO LIMITED
COMMERCE WAY
LANCING SUSSEX

ALWAYS ASK FOR 'SOLARBO' BY NAME

KINDLY MENTION 'AEROMODELLER' WHEN REPLYING TO ADVERTISEMENTS

Buy and Fly the Best... VERON

FOURNIER RF5

'TWO-IN-ONE' HILLSIDE SOARER AND CLASS 2 SCALE POWER!

PHOTOGRAPH OF OUR PROTOTYPE MODEL

KIT PRICE **£11.72**

FOR INTERMEDIATE 2 CHANNEL RUDDER & ELEVATOR ONLY

72" MOTEUR-PLANEUR

For 1.49 to 2.49 RACING DIESEL & GLO Motors (0.09 to 0.15 cu. in.)

IDEAL FOR BOTH SOARING AND THOSE WHO LIKE ALTERNATIVE SPORT SCALE POWER FLYING WHEN THE WIND DROPS!

"I think the popularity of the Fournier is due to a lot of things. It is an easy scale model to build, it flies very well, it is so elegant, but most of all, I think people are getting tired of these overpowered aerobatic bombs. I have a 1/2A racer and an aerobatic job, but much prefer the R.F.5. It always attracts a lot of favourable club comment. One visitor at the airfield on Sunday said that he had seen several R.F.5s, but mine seemed to fly better than any!

PROOF OF THE PUDDING!

— So they say! This is a verbatim quote from a well-known Midland modellist — Mike Pitchers — on the versatility of his Sport - Glo - powered Fournier R.F.5 (47 oz.).

Congratulations Mike!

IF YOU TOO WANT A 'HAPPY' AIRCRAFT THE R.F.5 IS JUST THE TICKET!

NEW! – NEW!

FOX 19 (11900) 3.5 c.c. **£4.92**

NEW! – NEW!

FOX 19 R.C. (21900) 3.5 c.c **£7.57**

FOX SILENCER **£1.88**

QUALITY AND ECONOMY PRICES — FROM YOUR LOCAL DEALER!

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

FOX

ENGINES

STANDARD & R.C.

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

Ask your dealer for a Fox Price List of Accessories-: Spinners, Engine Mounts, Prop Shaft Extensions, Wheel Collets!

WORLD WIDE AND EUROPEAN DISTRIBUTION

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

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

Aero Modeller

INCORPORATING
MODEL AIRCRAFT

October 1973 Volume XXXVIII No. 453

CONTENTS

This periodical is sold subject to the following conditions that it shall not, without the written consent of the publishers, be lent, re-sold, hired-out or otherwise disposed of by way of the Trade except at the full price of 20p or 1 dollar and that it shall not be lent, re-sold, hired out or otherwise disposed of in a mutilated condition or in any unauthorised cover by way of Trade, or affixed to or as part of any publication of advertising, literary or pictorial matter whatsoever.

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

Advertisement Offices: Model & Allied Publications Ltd., P.O. Box 35, Bridge Street, Hemel Hempstead, Hertfordshire HP1 1EE. Tel: Hemel Hempstead 56117.

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

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

MODEL & ALLIED PUBLICATIONS LTD.

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

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

Editorial Director **D. J. LAIDLAW-DICKSON**

Managing Editor **R. G. MOULTON**

EDITOR **P. S. RICHARDSON**

Advertisement Manager **M. GRAY**

COMMENT

Remarkable weather contributed to the magnificent success of the World Championships for Free-Flight models held on the vast plain at Wiener Neustadt. The results speak for themselves. Standards were such that it was a case of consistent flying to qualify for the eventual fly-off rounds. In the glider class, over 46 per cent of the entry could claim to be equal first in the main seven-round event! Situations like these demand a touch of luck or exceptional skill for any competitor to head the individual results. While one is obliged to accept the former, it is infinitely more satisfactory when leadership is distinguished by its performance, and such was the case at the 1973 Championships.

Seven Soviet Nations held a full-scale 'rehearsal' at Plovdiv in Bulgaria from May 31st to June 4th. Each of the classes ended in fly-offs. It is significant that many of the names involved subsequently appeared in the Austrian fly-offs. Even more significant that top two places in the Glider and Wakefield World Championships should also have been Plovdiv finalists, while Western Europe dominated the Power Championship results.

Surely this is Joachim Loffler's year? Winner at Plovdiv, Wiener Neustadt and the tri-Nation Internats at Erfurt, East Germany, his persistent success can be summarised in one word – preparedness.

on the cover

A. C. Jansen displays his free-flight Bristol M.ID Racer which delighted the crowds at Old Warden on the AeroModeller Scale Day with its slow, steady flights across the airfield. The model spans 63 in., weighs 39 oz. and is powered by an elderly E.D. Mk. II 2 c.c. diesel engine.

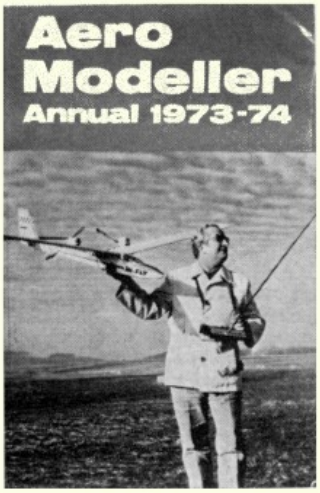
next month

Plans of the highly successful and much developed Dutch F.A.I. team racer, Turtle IV. Technicalities from the Free Flight World Championships. News from the Bochum C/L International. Beginners' series plus all the regular (and not so regular!) features in the November issue – on sale October 19th.

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

MAP The Finest Range of Model Technical Books in the World!

AEROMODELLER ANNUAL 1973/4



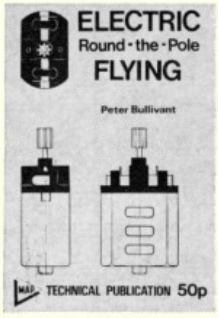
A full mixture to suit all tastes. The Annual was the first to foresee the model helicopter, electric power, use of carbon fibres and foam plastics, and this year's volume maintains the proud reputation now upheld for 26 years of continuous publishing.

8½ x 5½ in. 144 pages. Printed boards.

£1

126 ELECTRIC R.T.P. FLYING

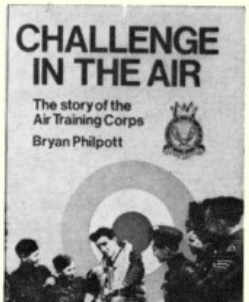
A compact and full appraisal of all aspects of electric-powered round-the-pole flight from which the experimenter can produce all he needs for operation either at home or for the clubroom. Liberally illustrated, and written from long experience by Peter Bullivant, the text includes data on choosing the motor, fitting propellers, gearing and direct drive, scale and novelty, model subjects and rules for club contests. Highly recommended to all who seek a novel and rewarding indoor model flying activity.



56 pages, 8½ x 5¾ in. stiff cardboard covers. 49 photographs, 19 diagrams, 56 pages, 4 model plans. List of suitable designs. Actual-size drawings of four suitable electric motors. Diagrams cover various pylon heads and controllers. **50p**

156 CHALLENGE IN THE AIR

The story of the Air Training Corps from its tenuous beginnings after the 1914-18 war when the idea of a youth organisation with an aeronautical flavour formed in the minds of two young ex-servicemen – to its present position as the main source of recruits for the Royal Air Force. The story unfolds via the formation of the Air League's Air Defence Cadet Corps, through the difficult days of World War II – during which the Air Training Corps was formed – to the present day.



Size 6 x 8½ in., 164 pages, being 128 pages of text, and 35 pages of illustrations. Bound in Linson, with gold blocked title on spine, dust cover. **£1·75**

3 AEROMODELLER POCKET DATA BOOK

Simply packed with clear sketches and useful tables to help modellers in every branch of aero modelling.

7½ to 4½ in., 64 pages. With 61 pages of detailed explanatory sketches and text, based on Flying Models Reference Handbook. **45p**

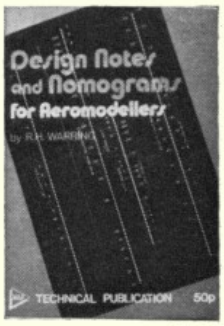
8 FLYING SCALE MODELS

All types of scale flying models are described in turn – glider, free-flight and control-line, Jetex, diesel, rubber or ducted-fan types. Much useful information is given on achieving highly realistic finished and detailed parts and there is a useful set of tables listing camouflage and insignia from 1914 up to date. Very large number of illustrations, including photographs, diagrams and scale plans.

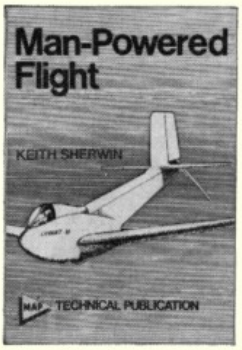
8½ x 5½ in. Paperback. Over 300 diagrams, sketches, photographs, ilustrations, 74,000 words. **£1**

171 DESIGN NOTES and NOMOGRAMS FOR AEROMODELLERS

Vital data for the designer, conversion scale, tabular facts and criteria, plus the famous Nomograms which have been long in demand for the serious contest modellers. These charts enable involved design factors to be determined quickly. Drag, Aspect Ratio, Power loading, Reynolds Number, Rate of Climb, Rubber Power, Downwash plus many other vital charts.



Size 8½ x 5½ in., 56 pages International A5, stiff card cover, saddle stitched. **50p**



155 MAN-POWERED FLIGHT

In this first book, primarily aimed at the student of man-powered flight, Dr. K. Sherwin, of the University of Liverpool, analyses the problems of design structure and operation, adding his own theories for production of a practical "pedal scooter". Over 128 specially selected illustrations collected by Aeromodeller staff convey a pictorial history of progress and combined with more than 90 text diagrams, form a scientific reference work of great value to all students of aviation.

8¼ x 5¾in., 176 pages (International A5 size) with 2 lb. strawboard covers bound in Balacron with gold blocking on spine. **£1·75**

MAP

HOW TO ORDER. Ring round the reference number of the titles you have chosen. Carry out totals to cash column and then total up at the bottom. Please add 5p packing and postage for orders of 62½p and below, 7½up to to £1, 10p up to £1.50, 15p up to £2. Above this

Registered England 328308
Registered office
12/18 Paul Street, London EC2A 4JS

3. 8
126. 156
171. 155
A/Annual 73/74

£

Name .....
Address .....
.....

MODEL & ALLIED PUBLICATIONS LTD.,
P.O. Box 35, Bridge Street,
Hemel Hempstead, Herts HP1 1EE

KINDLY MENTION 'AEROMODELLER' WHEN REPLYING TO ADVERTISEMENTS

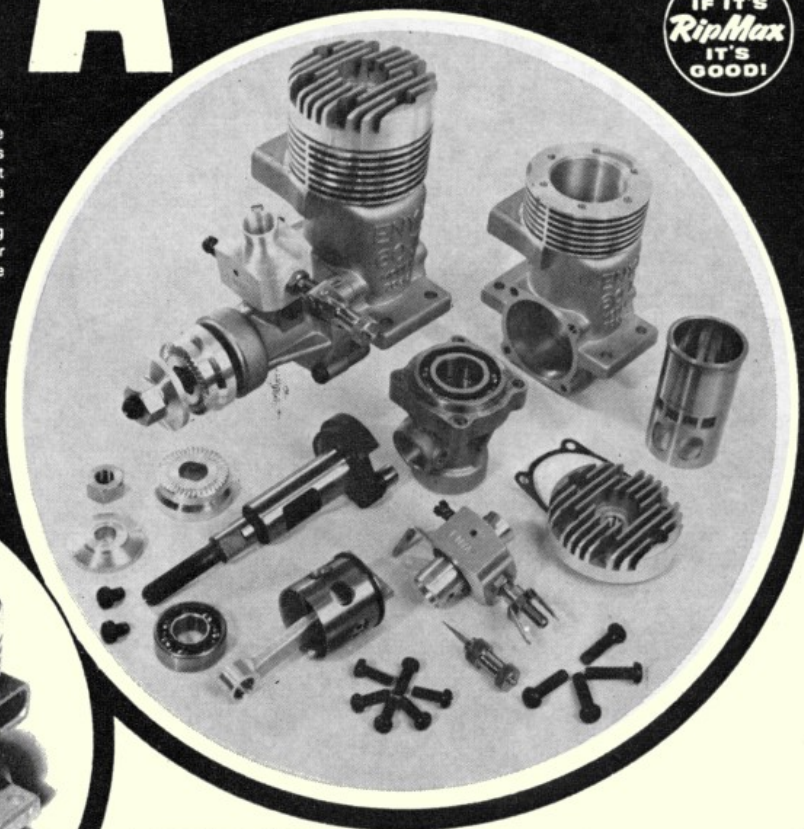
ENYA '74

the world's most wanted engines

IF IT'S RipMax IT'S GOOD!

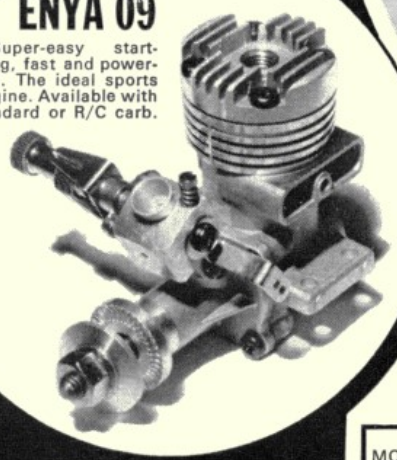
ENYA ENGINES for smooth, effortless performance and reliability, plus technical features other engines cannot match! Exceptionally vibration free, even at constant maximum speed operation. Each one is a first-class example of precision engineering, produced by master mechanics. Easy starting . . . long life . . . and dependability. Designed to power YOUR model into the winning circle! Unbeatable for value, too!

.09 .15 .19
.35 .45 .60



ENYA 09

Super-easy starting, fast and powerful. The ideal sports engine. Available with standard or R/C carb.



A COMPLETE range of sports engines . . . at really attractive prices (buy NOW . . . prices MUST go up!). Backed by full SPARES & SERVICING facilities. Whatever model you choose you can be sure of REAL VALUE FOR MONEY!

MODEL	DISPL. cu. in.	DISPL. c.c	WEIGHT (oz) STD	WEIGHT (oz) R/C	PROPELLERS F/F	PROPELLERS R/C	PROPELLERS C/L	STD £	R/C £
ENYA 09	·049	0·8	3·4	4·1	7×4 8×3	8×4 8×3	7×6 8×4	**4.65**	**6.15**
ENYA 15	·15	2·47	4·8	5·2	8×4	9×4	8×6	**5.95**	**7.75**
ENYA 19	·198	3·25	5·3	5·7	9×4	9×4 10×4	8×6 9×5	**6.80**	**8.60**
ENYA 35	·357	5·85	7·7	8·6	10×5 11×3	11×4	10×6	**8.75**	**10.80**
ENYA 35BB	·357	5·85	8·6	9·1	10×5 11×3	11×4	10×6	—	**13.95**
ENYA 45	·457	7·5	9·1	10·0	11×5	11×6	11×6	—	**18.60**
ENYA 60	·606	9·95	13·7	15·0	12×6	11×8 12×6	11×6	—	**22.95**

ENYA ACCESSORIES

SILENCERS

ENYA 09	£1.10
ENYA 15 & 19	£1.35
ENYA 35 & 45	£2.00
ENYA 60	£2.70

All ENYA models from 09 through to 60 are also available in watercooled marine versions, complete with matching flywheel.

THROTTLES

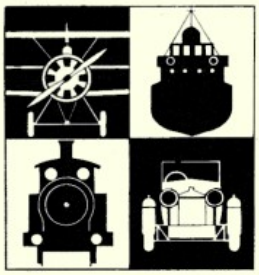
ENYA 09	£2.20
ENYA 15	£2.20
ENYA 19	£2.20
ENYA 35	£2.50
ENYA 45	£3.40
ENYA 60	£5.50

Needle Assemblies

ENYA 09	48p
09, 15, 19 R/C	84p
ENYA 15, 19	68p
ENYA 35	72p
35 & 45 R/C	84p
ENYA 60	94p

DISTRIBUTED BY RIPMAX

AT YOUR MODEL SHOP



43rd Model Engineer

EXHIBITION . 1st - 12th January 1974

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

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

ENTRIES
Every kind of model is eligible to entry. Over 20 trophies; over £300 in prizes, plus the pleasure of displaying your efforts and seeing those of other people. Rules and Entry Forms now available. All small models displayed under glass to keep them clean and untouched.

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

CLUBS
Club parties are especially welcome. Some clubs are arranging with us for a special day, when they will put their boats on the pool, arrange for their best locomotives to enjoy 'track time' and even have their varied contest entries grouped as a combined 'club show'. If yours can do something special, please tell us soon so that we can work it in.

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

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

CLOSING DATE
Model entries should be in by Monday, 15th October. There are always latecomers – please enter early, it helps us.

COMPETITION CLASSES

A	Locomotives. 2½ in. gauge and over.
A1	Locomotives – to any L.B.S.C. design 2½ in. gauge and over.
B	Locomotives. In gauges I and O.
BA	Locomotives. In gauges smaller than O.
C	Rolling Stock and Accessories. Gauges I and O or larger.
CA	Rolling Stock and Accessories. Gauges smaller than O.
D	Steam and Motor Ships of any period. (Non-working).
E	Power Driven Boat Models. (Complete with power plant.) Scale or Freelance.
F	Sailing Ships of any period. (Non-working.)
G	Working Yachts and Sailing Ships.
H	Hydroplanes and Speedboats.
I	Miniatures. Length of hull not to exceed: 9 in. for ½ in. to 1 ft. scale or larger; 10 in. for 1/16 in. scale; 12 in. for 1/25 in. scale; 15 in. for 1/32 in. scale. No limit for smaller scales.
J	General Engineering Models (including Stationary and Marine Engines). } models working
K	Internal Combustion Engines. } models working
L	Mechanically Propelled Road Vehicles (including tractors). } models working
N	Tools and Workshop Appliances.
O	Engineering Scale Models (Non-working).
P	Scenic and Representational Models (including Architecture).
Q	Horological, Scientific and Optical Apparatus.
R	General Craftsmanship – not otherwise classified.
S	For any type of model or mechanical work by a junior under the age of 16 by 31st December, 1973.
AA	Flying models of all types: (a) free flight, (b) control-line, and (c) radio control.
AB	Scale flying models of all types, rubber, glider, power, control-line or radio control.
AC	Scale non-flying models.
AF	A piece of radio control equipment built to a design published in 'Radio Control Models & Electronics', 'Aeromodeller' or 'Model Boats', or: Any piece of radio control equipment built from a commercial kit, or:
MA, MB, MC, MD, ME, MF	Classes covering miniature figures, dioramas, artillery, etc., detailed on official entry form.
WA	Piece of Modern Furniture.
WB	Any work in glass-fibre or other plastic as main constituent.
WD	General Craft work – musical instruments, carving, marquetry, drawings.

Junior Prize additional in each class with three or more entries. (Under 16 on 31st December, 1973.)
Schools can enter for Schools' Competition under Craft Section.

Entry Forms and Advance Bookings from:

EXHIBITION MANAGER,
M.A.P. Ltd., P.O. Box 35,
HEMEL HEMPSTEAD, HERTS HP1 1EE.

MacGregor puts you in the Pilot's Seat.

"If only I could give it a bit of up elevator!"
Haven't you ever thought that to yourself when that beautiful free flight model you've spent all winter building does a sudden flip or catches a gust of wind. Just imagine how much extra fun it would be if you could have control over your craft.
Well, you can. With a MacGregor Radio Control outfit, you can put yourself right there in the cockpit and fly your 'plane just like the real thing!
And it needn't be expensive. With more than ten years' experience of designing and manufacturing best selling, top quality model control gear we can today offer you the finest, most comprehensive range of precision equipment in the world with something to suit every requirement and pocket.
A single channel outfit for instance with simple rubber driven escapements for both rudder and engine control can cost as little as £19! Or if you are more ambitious and desire more sophistication there are complete digital proportional outfits ranging from £42 right up to £150 or more, with a complete range of accessories and spares to suit any application. And of course all this is backed up by one of the finest and swiftest after sales organisations in the business.

Available from all Ripmax stockists throughout the UK

MacGregor Radio Control,
Canal Estate, Langley, Bucks. SL3 6EQ

Write to us today enclosing a stamped addressed envelope for more details or call and see our products for yourself at your local model shop. We feel sure you'll want us to help you make your wish come true!

Don't throw away that old

BIC

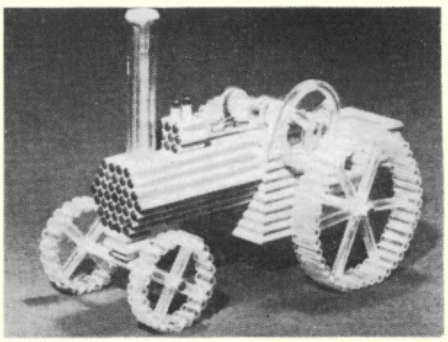
Regd. Trade Mark

CRYSTAL BALLPEN

Don't throw away your old Bic Crystal ballpens, collect them from your home or office. Cut them, glue them, bend them and fuse them to make even more fantastic models for 1973. With a little imagination you can convert a used pen into the holiday of a lifetime.

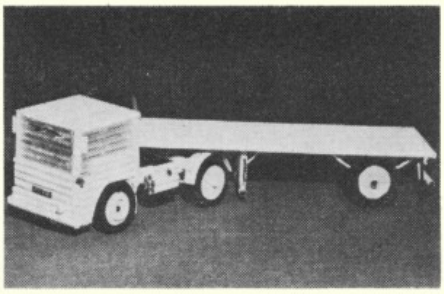
Mr. L. Burrows of South London didn't and won **£250** and the Bic National Trophy.

Entry: The Bic Traction Engine



Mr. A. Brooks of Lancashire didn't and won another cash prize.

Entry: The Bic Leyland Lorry



THIS YEAR YOU COULD WIN A 14 DAY HOLIDAY FOR TWO IN TUNISIA

Yes, Tunisia* on the North African Coast with three prizes of a weekend for two in Paris* for the runners-up.

*Or the cash equivalent.

Imagine yourself in the mysterious markets of North Africa, camel treks and miles of white sands — all yours for a few old pens and a little ingenuity.

The Bic Model-Making Competition is divided into two half-yearly prize events.

Entries must be received by November 30th, 1973. Competition rules available on request.

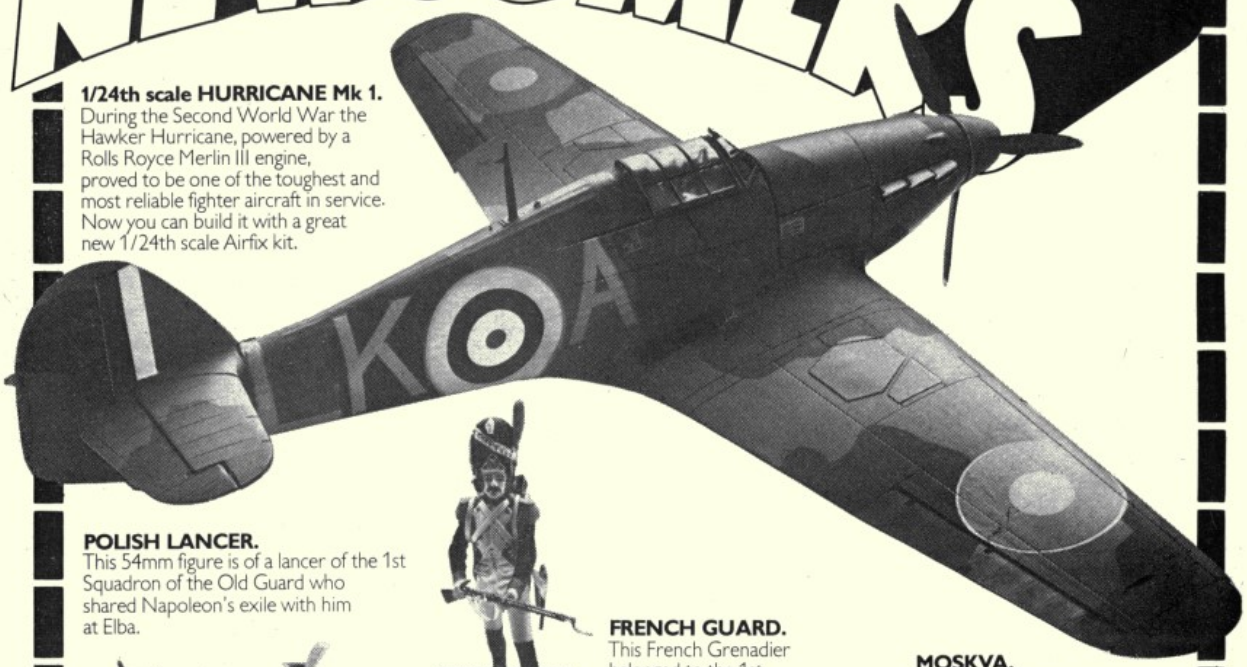
Send your models to the BIC Model Making Competition

Regd. Trade Mark

c/o Montague House, 23 Woodside Road, Amersham, Bucks.

AIRFIX NEWCOMERS

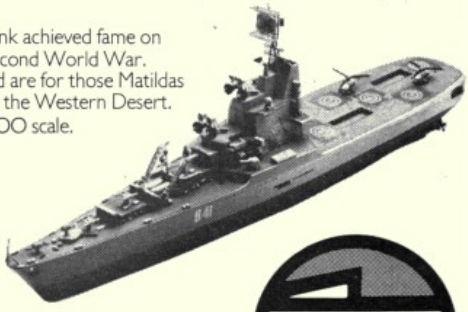
1/24th scale HURRICANE Mk 1.
During the Second World War the Hawker Hurricane, powered by a Rolls Royce Merlin III engine, proved to be one of the toughest and most reliable fighter aircraft in service. Now you can build it with a great new 1/24th scale Airfix kit.



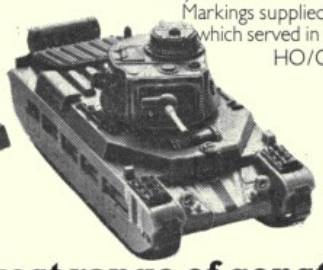
POLISH LANCER.
This 54mm figure is of a lancer of the 1st Squadron of the Old Guard who shared Napoleon's exile with him at Elba.

FRENCH GUARD.
This French Grenadier belonged to the 1st Regiment of Foot Guards formed in 1804, and makes a beautifully detailed 54mm model.

MOSKVA.
This Russian anti-submarine warfare helicopter carrier—maximum speed 30 knots—came into service in 1968. She has provision for 30 helicopters.



MATILDA TANK.
The Mk II Infantry Tank achieved fame on many fronts in the Second World War. Markings supplied are for those Matildas which served in the Western Desert. HO/OO scale.



The world's biggest range of construction kits

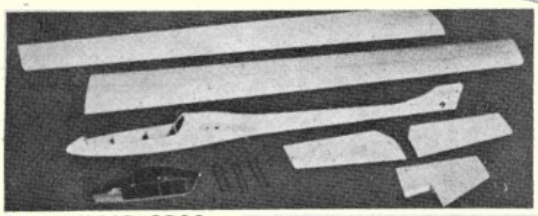
AIRFIX

Graupner for top quality!

CIRRUS 118" span SCALE SAILPLANE

A truly fabulous model and a fabulous kit! For hi-start, slope soaring and powered-glider flying. Takes 2- to 6-channel R/C gear for rudder, elevator and aileron controls – or operate as a free-flight model! The performance of the CIRRUS is the nearest thing to full-size flying yet!

Injection - moulded fuselage parts in hi-impact NOVODUR plastic – and now with ready-formed plastic cabin frame.



CIRRUS and **CUMULUS** (even more ready-formed) set dazzling **NEW STANDARDS** for model kit production . . . unrivalled anywhere!

CUMULUS 2800

(detail pic. above)

Ready - formed components include complete fuselage of NYLON, balsa - planked wing panels and tail surfaces, canopy, hardware, etc. Specially designed for QUICK assembly! CUMULUS is a multi-purpose model, ideal for R/C rudder and elevator control.

Phil Kraft's KWIKFLY Mk 3

59½" span. For engines up to .61.

Acclaimed as the FINEST R/C KIT YET for multi or proportional R/C installations.

43" span AMATEUR

Engines up to 1.5cc

A superb model for 'Sunday flying', or as an R/C trainer.

TAXI

59" span

The 'classic' R/C trainer or sports model for engines 1.5-3.5cc (.09-.49 glow)

Phil Kraft's MIDDLE STICK

55" span

For engines up to .40 R/C only.

Graupner GLIDERS

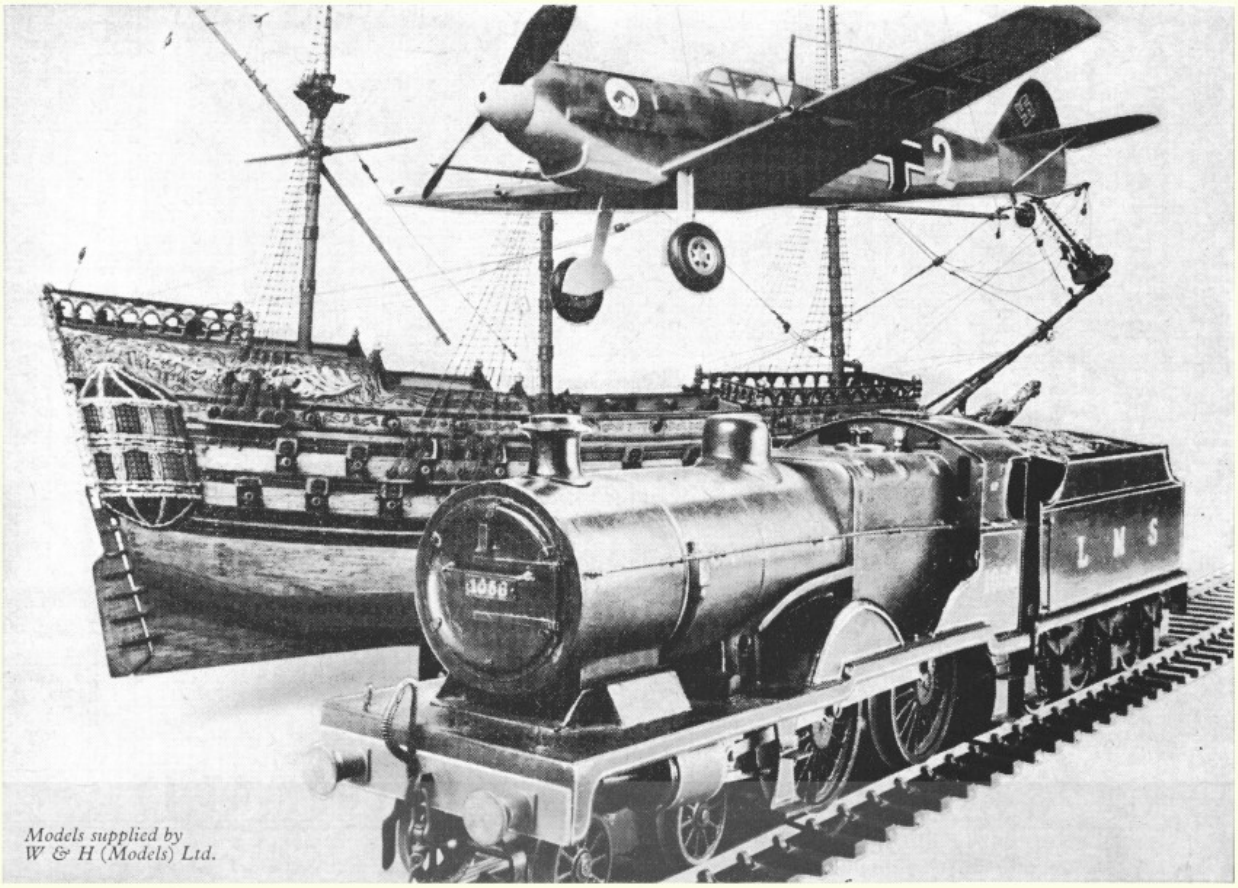
BEGINNER 39" span	£4.00
FILOU 50" span	£7.15
Pylon engine mount	£1.30
JOLLY 45" span	£5.30
Pylon engine mount	£1.30
AMIGO 2 78¾" span	£12.25
Pylon engine mount	£1.70
Ditto in ABS	£3.40
FOKA 102¼" span	£19.75
Canopy 90p Fuselage	£7.50
Wing grommets (10)	£1.40
UHU mark III 43¼"	£3.75
DANDY 63" span	£10.20
Pylon engine mount	£1.30
CIRRUS 118" span	£27.50
Pylon engine mount	£2.10
R/C pack	£4.40
NANCY 48¾" span	£6.00
KATY 67¼" span	£11.45
CUMULUS 2800 110"	£62.00
Pylon engine mount	£2.10
R/C pack	£3.60
AS-K14 90½" span	£54.90
Canopy 65p Fuselage	£24.10
R/C pack	£6.00
HI-FLY 90½" span	£19.80
R/C pack	£3.00
Pylon engine mount	£3.40
Electric motor flight pack	£11.80
Installation pack	£4.00

Graupner

TOPSY 32" span	£5.05
AMATEUR 43½" span	£11.30
TAXI 59" span	£17.95
MINI PIPER 28¼" span	£8.70
KWIK FLY MK3 59¾"	£28.85
MIDDLE STICK 55"	£21.80
CESSNA 177 CARDINAL 61" span	£43.35
Wheel Spats	£4.15
R/C Installation pack	£7.10
TERRY 41½" span	£13.10
BELL 212 HELICOPTER	
Fuselage Kit	£56.00
Engine & Mech. Kit	£153.50
Engine only (HB61 Stamo)	£56.75
Engine Silencer only	£7.60
Rotorhead only	£46.35
Main Rotor Blades	£3.20
Tail Rotor Blades	£1.15
Steering Rotor Blades (pr)	£3.30
Main Rotor Shaft only	£2.90
CONTROL LINE	
MUSTANG 29¾"	£7.80
DORNIER Do 27 31½"	£9.70
F-W 190 38½"	£11.70
KLEMM KL-107B 28½"	£8.00

distributed by RipMax **see them all AT YOUR MODEL SHOP!**

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



Models supplied by W & H (Models) Ltd.

Whatever your modelling interest...

You have only to glance at our illustration to see that with X-acto fine tools in your hands there's a new modelling dimension waiting to be explored. X-acto tools will help you create the model of your choice with precise perfection.

No. 86 X-acto and Tool Set (£7.50) Just one of many hobby kits available

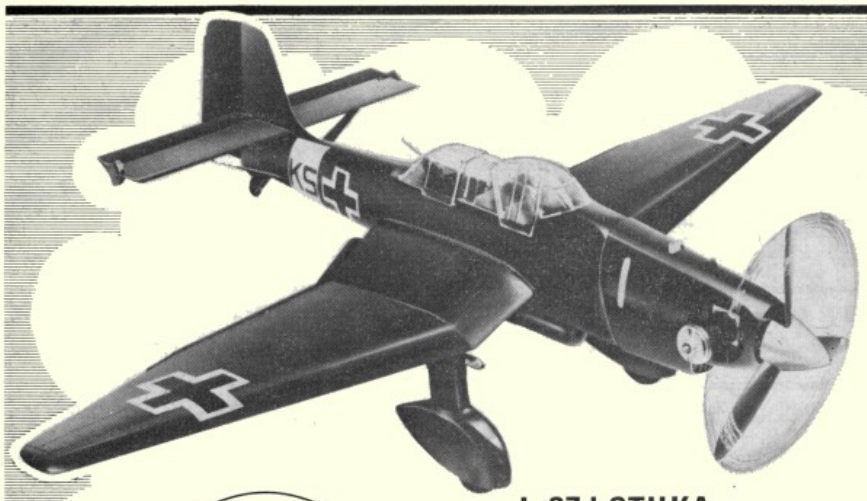
x-acto precision tools for modelmakers

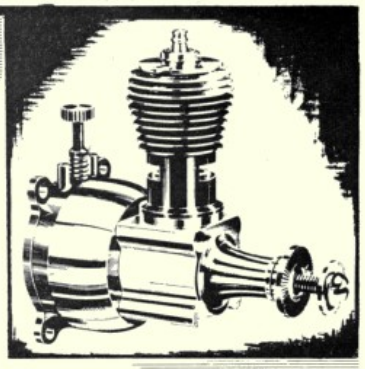
Everything from a single knife to a complete Hobby Chest (From 17p -£19.25)

x-acto®

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

AVAILABLE FROM ALL GOOD MODEL SHOPS





Full instructions for flying and maintaining these ready moulded models are supplied.
Also a complete list of replacement parts. Treat it well and it will reward you with many hours' enjoyment.

COX

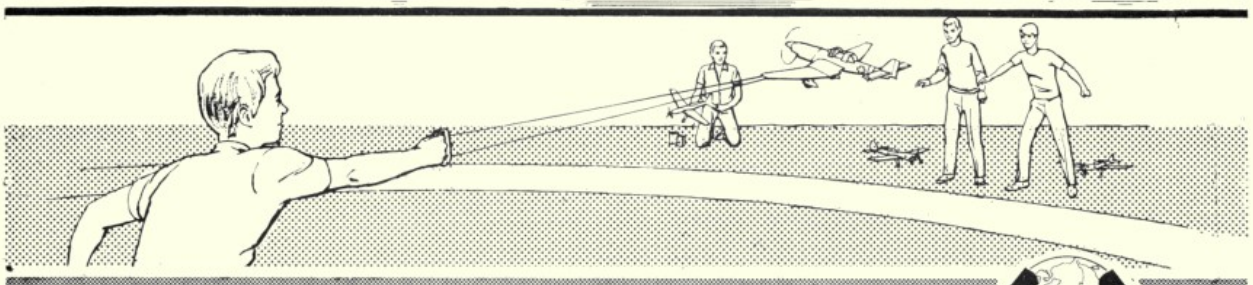
Ju87d STUKA

Accurate in every detail, this model carries all the features of this famous plane from the massive inverted gull wing down to the tiny propeller-driven generators., Cox's Stuka features sliding front and rear canopy, rear mounted machine gun, a simulated four inch bomb that can be dropped in flight plus detailed pilot and gunner figures. Comes equipped with easy-to-start Cox .049 engine with spring starter. Wingspan 23½".

Price complete
£10-94

SPITFIRE Mk. VB

This Cox quality model is a high-performance flying replica of the famed Mark V version of the Spitfire. The Mark V was the most popular style of this exciting plane produced. The spirited power provided by the Cox .049 Babe Bee engine gives this model superb performance characteristics closely approximating its versatile predecessor. Fine detailing and authentic camouflaging complete the models realism. Wingspan 23½". Price complete
£10-42



A. A. HALES LTD

P.O. Box 33 Hinckley Leicestershire

HALES
LEADER IN THE WORLD OF MODELS

R.G.L.

NATIONWIDE MAIL-ORDER

NEW MOTORS

COX PEE WEE	£3.66
BABE BEE	£3.43
TD .049	£6.65
D.C. RAPIER STD. + SIL.	£9.08
S. TIGRE G15 GOODYEAR	£12.58
G20/15D	£9.35
K & B 15R STD.	£18.05
KOSMIC 23 STD.	£8.95
ROSSI 15 FAI	£34.00

PYLON CRAFT TRANSFERS

FULL RANGE IN STOCK

TRADE-NAME MOTIFS (STP Etc.)	50p
TRIMSHEET	60p

VECO STREAMLINE WHEELS

1¼ HARD	Pair	28p
1⅛ HARD	Pair	32p

1 oz. LIGHTWEIGHT GLASSFIBRE CLOTH

3 YARD PACK	£1.45

DREMEL JIGSAW	£33.50
ACCESSORY PACK	£16.45

FOX ALUMINIUM SPINNERS

	A	B
1½"	£1.91	£2.09
1¾"	£2.09	£2.28
2"	£2.29	£2.46
2¼"	£2.46	£2.66
2½"	£2.66	£2.85

Type A–Conventional
Type B–Slim Jim Type

TOOLS

DAVID PLANE	£1.35
2V ACC.	£2.35
2V CHARGER	£3.30
RING SPANNER SET 0, 2, 4, 6 BA	£1.65
NEEDLE FILE SET	£1.75
X-ACTO RAZOR SAWS ¾"	18½p
1"	18½p
1½"	41½p

PLUG SPANNERS

KBK 4 WAY	59p
FOX 4 WAY	30p
OS 2 WAY	65p
MERCURY BOX	18p

EPOXY RESINS

DEVCON	Small	49p
DEVCON	Med.	£1.04
AEROBOND	8 oz.	£1.32
ALUMINIUM FILLED		80p
FAST CURE		£1.10
GEN. PURPOSE		90p
CLAM SILICONE SEALER		75p
TUFKOTE PROOFER		39p

GLOW PLUGS

FIREBALL – Hot	40p
Med.	40p
Cold	40p
TAYLOR	40p
VULCAN VRI, 2, 3, 4	40p
ROSSI RI, 2, 3, 4, 5	60p
EG200 (door knob)	59p
EG99	50p

K & B SUPER POXY — THE ULTIMATE FINISH

PAINT ¼ pt.	60p
½ pt.	90p
PAINT CATALYST ¼ pt.	60p
½ pt.	90p
PRIMER ½ pt.	80p
PRIMER CATALYST	80p
THINNERS	£1.25, £1.90

Colours available:- Yellow, Blue, Red, Black, White, Orange

COLOUR CHART	20p

ENGINE AIDS

RGL PROP. BALANCER		99p
KAVAN TACHOMETER		£30.00
OPTAC	(A)	£16.50
OPTAC	(B)	£16.50
TIMERS	From	£1.75

ACCESSORIES

BLACK RUBBER TUBING		14p
SILICONE TUBING	Small	69p
	Med.	69p
GLOW PLUG CADDY		10p
COX 049 TANK EXTENDER		75p
DURAL SHEET — ALL 12" x 6" SHEETS 1/32		30p
1/16		44p
3/32		66p
1/8		86p
3/16		£1.25
1/4		£1.70

ENGINE TEMPLATES

OS 10
OS 15
OS 19
OS 35/40/40P
ENYA 09
15
19
60
K&B 40R

ALL AT 14p EACH

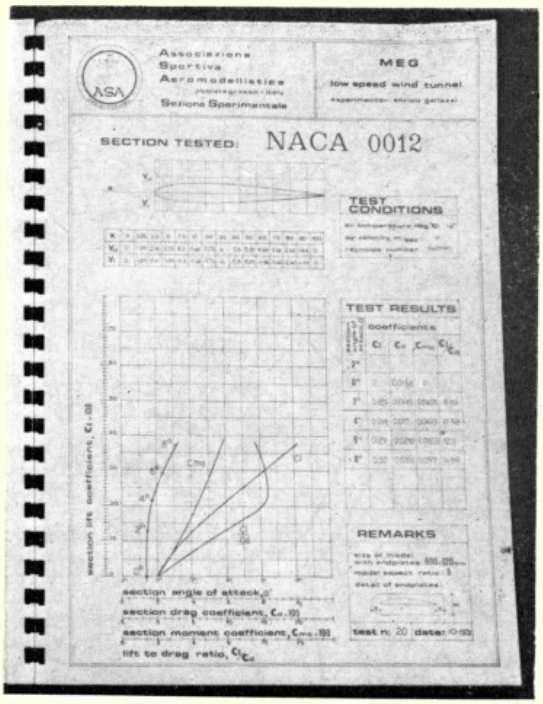
17 HANOVER BUILDINGS
SOUTHAMPTON
TEL. 0703-25565

ENGINE SPARES

FOR:- FUJI, S. TIGRE, FOX, VECO, OS, MERCO, DC, K & B, WEBRA, ENYA, ED & VAST RANGE OF COX SPARES

Heard at the HANGAR DOORS

MONTH OF AUGUST saw two really remarkable record claims lodged with the F.A.I. for official ratification. Firstly, on the 12th Volkerer Bitterer attacked the distance record for R/C Helicopters (Class F3C) flown in a closed circuit when he achieved 50 km. 800 metres at Mainz, Finthen in Germany. Edward Ciapala of Poland's achievement a week later, was no less remarkable, even though in striking contrast, when his FIA Indoor Model achieved a duration of 33 minutes 34 seconds when flown under a ceiling of 8-15 metres in height! This flight was made during an International competition at Debrecen, Hungary. As we said, two remarkable records, though yet to be officially recognised.



Typical page from the excellent book of Airfoil Sections and performance data published by the AeroModelling Sporting Association of Milan. Essential reading for all interested in aerodynamics.

CONGRATULATIONS to Ray Monks on being awarded the Bronze Medal of the United Service and Royal Aero Club. The citation is: 'An Aeromodeller for over 30 years and an outstanding competitor, Raymond Monks has represented Great Britain in World Championships on nine occasions, these being:
1951 – Yugoslavia (Glider); 1952 – Switzerland (Power); 1958 – Belgium (Glider).
1961 – W. Germany (Power); 1966 – Cardington (Indoor); 1967 – Czechoslovakia (Power).
1969 – Austria (Power); 1971 – Sweden (Power) and 1973 – Austria (Power).

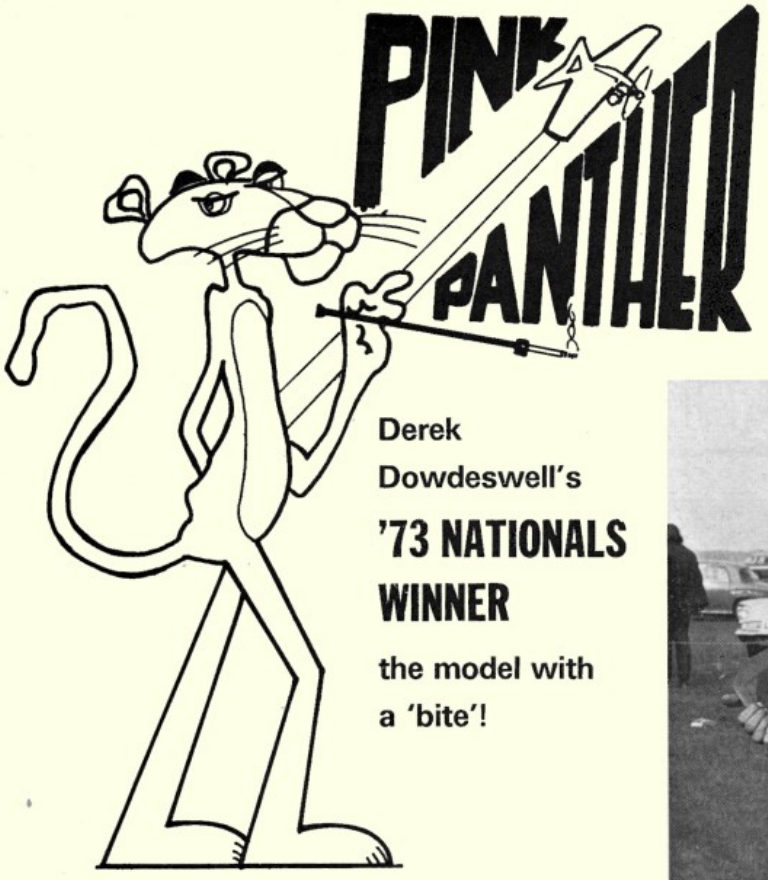
'In addition, Raymond Monks has attended many other European Championships and has upheld a high degree of sportsmanship at all times: he is universally recognised as one of the most popular model flyers both at home and abroad. His cheerful enthusiasm has always been of the greatest value to other team members at the very important and increasingly higher standard World Championships.'

CONGRATULATIONS, too, for the Society of Model Aeronautical Engineers, who have been awarded an FAI Honorary Group Diploma. The citation reads: 'The Society celebrated its 50th Anniversary in 1972, and is the oldest aeromodelling organisation affiliated to the Federation Aeronautique Internationale, and the oldest in the world. It is recognised as having made a contribution to the development of model aircraft design, building and flying, without equal amongst similar organisations. The Society laid the foundation of what is now the F.A.I. Programme of World Championship Events, when it inaugurated the Wakefield Trophy in 1926 for International Competition for rubber-driven models. This is still regarded as the Premier F.A.I. World Championship Award. In 1949 the Society initiated the post-war programme of F.A.I. World Championships, a programme which it has supported throughout the post-war years, having sponsored and organised no less than 11 of the 59 Championships run between 1949 and 1972.

'The Society has been responsible for setting the highest standards in every aspect of World Championship organisation, including the processing of models, the running of the various events, and the provision of first-class accommodation, in conjunction with suitable selected airfields. It has also been responsible for initiating at least two new World Championship Classes for models – namely: Indoor and Scale R/C and C/L. On a national basis, the Society runs an annual programme of approximately 100 Regional Competitions, culminating in the National Championships, which attract as many as 1,500 entries and 10,000 spectators each year. The Society has provided officers to represent the United Kingdom for the International Aero-Modelling Committee of the F.A.I., including two Presidents and one Technical Secretary for the Committee.'

A NEW SERIES of Airfoil Section tests has been published by the Aeromodelling Sporting Association of Milan, Italy, and sells at U.S. $6.95. In the first edition a bilingual introduction explains how Enrico Gallazzi has made a low-speed wind tunnel to his own design and has produced this very useful data to allow modellers to make practical comparisons with airfoil sections which have been tested under conditions similar to those in actual model flying.

The first book covers 16 airfoil sections, ranging from the popular Clark Y and NACA 6409, symmetrical types, the Eppler series and Göttingen. Polar diagrams give performance data at Reynolds numbers in the region of 60,000. The book will be available through Beaumont Aviation Literature, 11 Bath Street, London EC14 9EN.



fashionable, swept wing design with really hot performance

Derek Dowdeswell's

'73 NATIONALS WINNER

the model with a 'bite'!

THE 'NORMAL' procedure on occasions like this seems to be to write all about the model and the development thereof, whilst airing views on the general state of combat flying. Well, you'll all be glad to hear that I have absolutely no intention of trying to be different, so read on!

My first combat bout took place some two years ago, when I flew a very 'wide' *Twister*, which at the time was being pulled by a very tired arm and an even more tired Oliver Tiger. Also taking part in this extravanganza was a certain Richard Evans flying a very fast, very light model which shall remain nameless (*Ironmonger*, if you must know!) Needless to say, my opponent won, but after that bout it became apparent that I needed to change my model design. So all through the 1971 season I designed and built several models and eventually came across one that flew reasonably well. I stayed with this design for the greater part of the 1972 season, changing one or two features and trying new ideas. It was with one of these models that I came second in the Dutch International that year.

Then something else happened towards the end of that season that made me think very seriously about my design. While flying against a clubmate, Mick Tiernan, I flew a loop. Nothing wrong with that you may say, except that within that loop Mick managed to do an 'eight' and get two cuts into the bargain! After that bout I had a long look at Mick's models and came to the conclusion that once again mine were ready for the scrap heap.

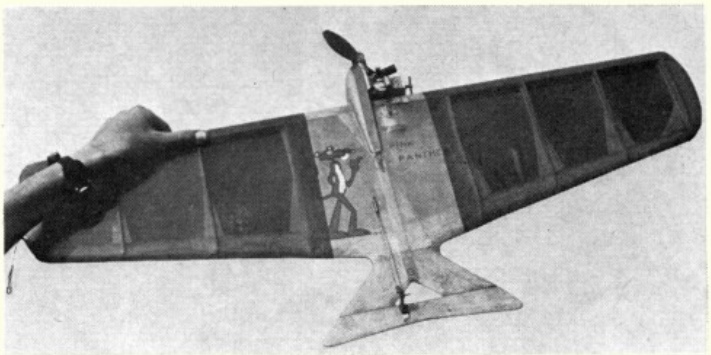
After building four models vaguely like Mick's, I finally came up with the model drawn here and it was with this that I won the '73 Nationals and placed fourth at this year's Dutch International.

Before any model airplane is built something has to be found with which to build it. During the history of Aeromodelling many different materials have been tried, but none have enjoyed the same success as wood, and in particular balsa wood, but when choosing your balsa wood there are several points to bear in mind. Firstly, it *must* be straight; it is no good having a really well-built model if it's the shape of a donkey's hind leg. Secondly, the wood must also be light, this especially applies to the leading and trailing edges, although all the wood in the outboard wing can be a little heavier than the remainder.

If this model is built in the correct sequence it is possible to build one in a week. Everyone has their own favourite building pattern, but for anyone who hasn't built many combat models before, then this is the suggested sequence. If a great number of models are going to be built then it is worthwhile to 'mass produce' certain items before starting on an individual model.

The first operation is to cut out and epoxy together the trailing edge, ensuring that it is flat. While this is drying, the tailplane is cut out and also epoxied. When both the T.E. and the tailplane are ready to work with they are epoxied together, taking great care to get them level. All the spruce spars are glued to the L.E. and the T.E. using P.V.A. The ribs are cut out and glued to the T.E. then the L.E. is glued to the ribs and the whole assembly clamped together,

Build it light (under 16 oz.) and straight, then bolt in a good 2.5 c.c. engine and you have a quick really competitive model. Note Derek's use of nylon-covered centre section, Solarfilmed tips. Probably best compromise of strength and minimum weight.

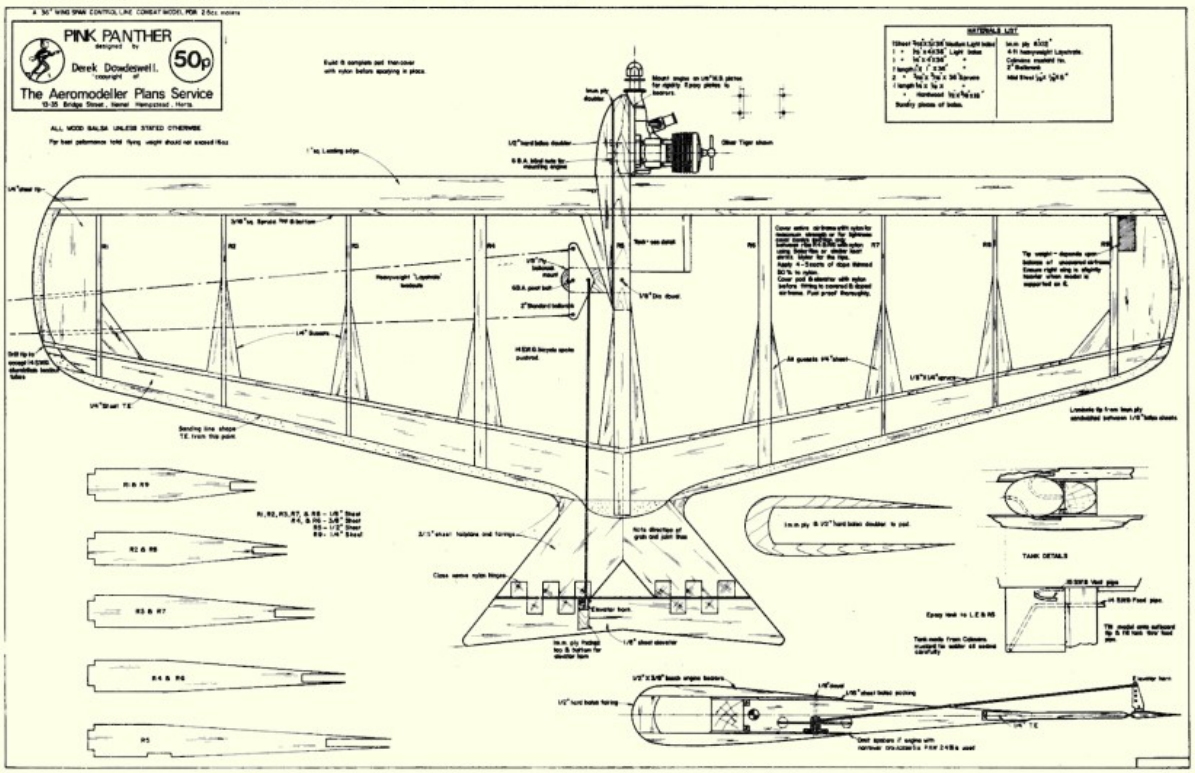


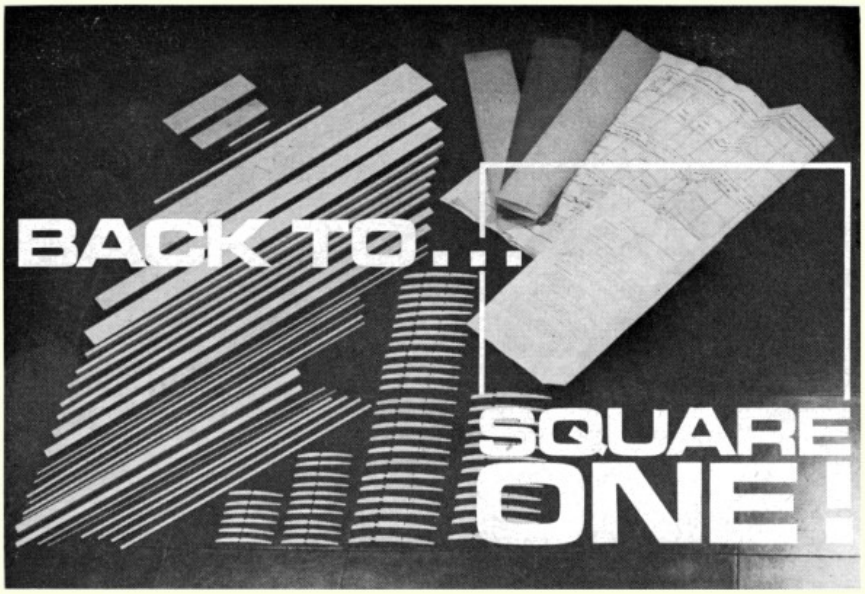
FULL-SIZE COPIES OF THE 1/6th SCALE REPRODUCTION SHOWN BELOW ARE AVAILABLE AS PLAN NO. CL 1206, PRICE 50p (INCLUSIVE OF POSTAGE AND VAT) FROM AEROMODELLER PLANS SERVICES, P.O. BOX 35, BRIDGE STREET, HEMEL HEMPSTEAD, HERTS HP1 1EE.

using elastic bands around the L.E. and T.E. While this basic frame is drying, the outboard tip plate is laminated up, using 3/32 in. balsa and 1/32 in. ply. This, together with the inboard tip plate, is then glued in place. The bellcrank assembly is made up and epoxied in position making sure that it is a good fit in the centre rib. Make up the leadout loops and construct the tank which is then epoxied in place. All the gussets may now be fitted together with the T.E./tailplane fairings. While all the glued joints are drying (I normally leave the frame overnight) the pod is made up – ensuring that the thrust line of the engine is parallel to the centre line of pod – which is then shaped and put to one side, as is the elevator.

The complete frame is then sanded to shape, making sure that an even wing section is obtained. If the whole model is to be covered in nylon then all the frame is given two coats of dope, but if the outboard part of the wings are to be covered in Solarfilm to save weight, then it is only necessary to dope the centre part of the frame together with the pod and elevator. The pushrod is installed and the model covered in nylon. The amount of dope applied is a matter of personal choice, but I normally put on about 4-5 coats of 50-50 dope/thinners. After the elevator is covered in nylon, it is fitted on to the model, using nylon hinges.

The pod is also covered in nylon prior to being epoxied in place. The elevator horn is fitted, using the 1mm. ply plates. If Solarfilm is to be used it is applied just prior to fuel proofing the nylon, which is done using a polyurethane varnish. The model is now ready to fly. As far as the centre of gravity position is concerned, the correct position varies from model to model, but once found for the first one built, try to build it to that position every time – alter using small pieces of lead. There isn't really any secret to combat flying, but a lot of practice and good organisation of a team are two things to remember at all times.





Spread of components for the Asteroid kit reveals die-cut ribs, much strip wood, clearly printed plans (with good instructions) plus coloured tissue.

Continuing our beginners' series with a slightly more advanced subject.

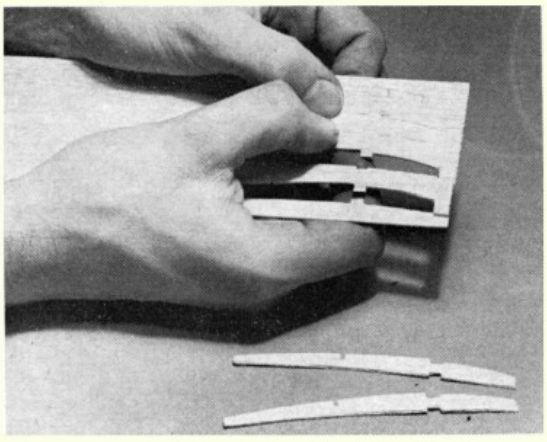
FOLLOWING a two-month 'breather', we continue now with the next step up the ladder from the previously detailed **Mercury** *Swan*. The model chosen is the *Asteroid* A/1 glider, kitted by **St. Leonards Model Supplies** (as advertised in this issue). Why another A/1 glider, and why another Jim Baguley design?

The reason behind the latter question is easy – just pure chance! However, the design itself was chosen rather more carefully. The wing and tailplane construction is relatively straightforward, especially as die-cut ribs are supplied, yet the techniques employed are up-to-date and in common with many larger gliders now being flown, i.e. the spars are fully webbed, a sheeted leading edge is employed and both spruce and balsa spars are employed. In addition, the fuselage shows a type of construction more likely to be found on recently published plans, and is designed to carry a clockwork dethermaliser used in conjunction with an auto-rudder. Both are commonly employed techniques on all sizes of gliders, and we shall detail their operation in the near future. All in all, a very 'modern' design, and once one has successfully accomplished such a model, then one could safely tackle the construction on most gliders.

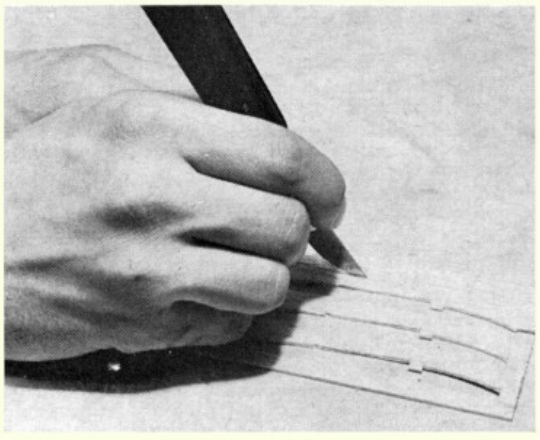
Again, perhaps we should make it clear that while we will detail the construction of this particular model, it is not essential that the novice should build the same design – many of the points covered during the construction of both the *Swan* and the *Asteroid* will be common to other designs. Also, points that have already been covered in construction of the first model will not be repeated in such detail, unless a new approach is to be explained.

As for equipment, only the tools and building board, etc., which we used for the *Swan* are needed – there are no essential 'extras' to buy! Our comments on adhesives still apply, of course – that is

The die-cut ribs may be gently pressed from their 'backing' sheet – but do take care to prevent damage. If you should break a rib, not to worry, there are a couple of spares provided anyway!



If a rib does not release easily from its surround, then lightly run around the outline with a balsa knife. Do not press too hard – it is unnecessary and may cause the blade to 'run-in', damaging the rib.



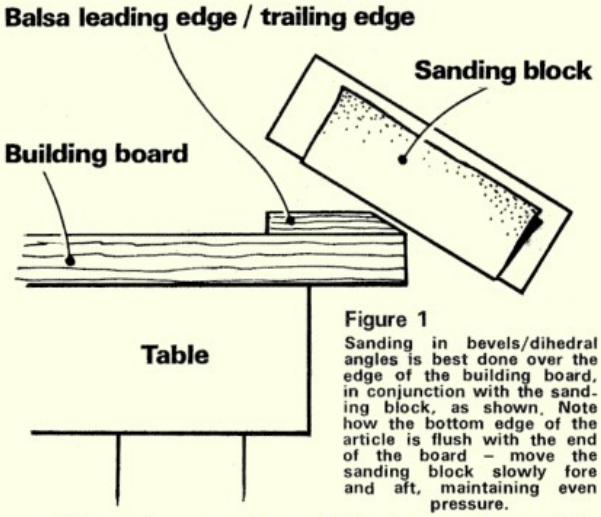
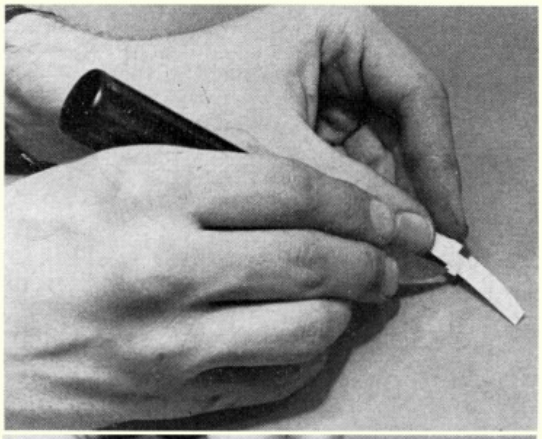


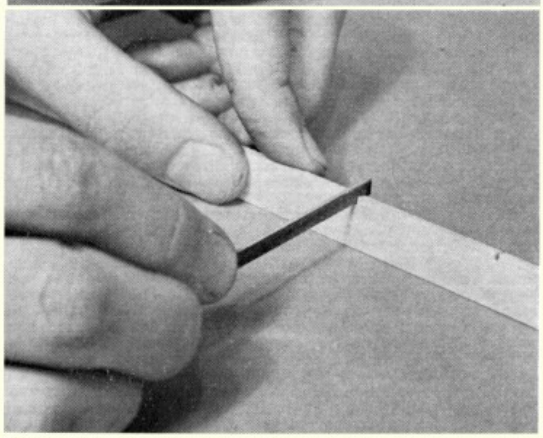
Figure 1
Sanding in bevels/dihedral angles is best done over the edge of the building board, in conjunction with the sanding block, as shown. Note how the bottom edge of the article is flush with the end of the board – move the sanding block slowly fore and aft, maintaining even pressure.

either balsa cement or a PVA glue may be used in most instances, depending on your own preference. Our own choice proved to be a PVA, this time a variety marketed by **Practical Scale,** known as *Aerobond No. 3 Airframe Adhesive.* We had not tried this glue before, but found that it combines all the normal virtues of PVA glue, plus is somewhat quicker drying than normal, and as the glue sets rather harder than most, is easily sanded down. This is quite a useful feature – many people dislike PVA glues as they set a little on the rubbery side so that when a joint line is sanded down the glue 'peels' and looks untidy. Not so with this product, a sanding block cuts through the glue neatly and cleanly.

Now for the model itself. Start as ever, by carefully studying the plans and the instruction leaflet so that you get a clear idea of the order of building, and that you know what each part is called. Tape the plan to the building board, and cover with polythene. Tape the polythene in place so that there are no wrinkles left.

The ribs have been die-cut, which is a major time and effort saver! You can probably just press out the wing ribs, but take care not to damage them. If they do not press out easily, then lightly run around the outline with a modelling knife. You may find that the spar notches need a little help from the knife blade.



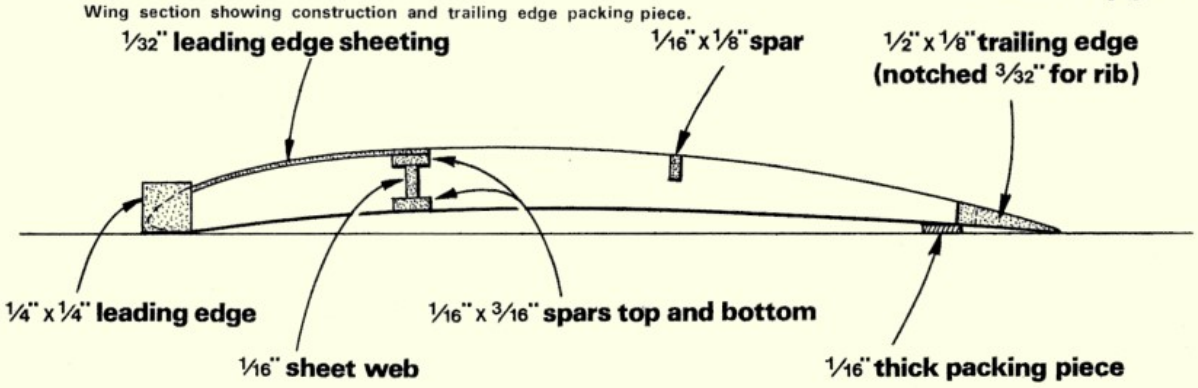


Top shows the spar notches being cleared with the point of the knife – there is no need to trim around the slot, just press on the scrap wood. If the rib edges are rough, sand them down very lightly with fine glasspaper. Above, using a small file to cut the slots for the ribs in the trailing edge material. Most model shops will stock the RipMax files, one of which proved ideal producing a slot exactly 1/16 in. wide to suit the ribs.

Note that the wing consists of four panels: two centre panels and two tip panels, although only the right-hand centre panel and tip is shown. Start with the right-hand centre panel by cutting the leading and trailing edges to length. The ends of these pieces will need to be bevelled slightly to suit the dihedral

continued on page 577

Figure 2
Wing section showing construction and trailing edge packing piece.



John O'Donnell's

FREE FLIGHT COMMENT

Our columnist with his new, large area magnet soarer. New? Well, not really, the wings and tail date back to 1950, coming from his 'Pothunter' open glider, while the rear fuselage started life as a 'Cargo Clipper'. However, the front fuselage and magnet unit have not seen the light of day before! (Jeff Palmer photo.)

THE LENGTH of last month's 'Comments' gave some indication of the crowded contest scene earlier this year. After the Nationals there was plenty of activity until mid-July – and then practically nothing until the end of August. There have been mid-season 'lulls' before – but nothing like that experienced this year.

The reasons for this phenomenon presumably include the 'crop situation' (and the attendant retrieving problems) and the effects on participation and organisation of summer holidays. Nevertheless, the situation makes an interesting comparison with the customary notion of aeromodelling being a 'summer pastime'.

As usual I will take events in order; and hence start with the **Area Centralised** contests held on 10th June, just a fortnight after the Nationals. R.A.F. Elvington should have been a very busy venue as it was used not only by the home Northern Area but also by the North Western and North Eastern areas as well. Furthermore, the Northern Area also ran the *Pannett*, vintage and associated events that normally form a separate meeting – and which would have been held as such had not Topcliffe been double-booked on the original date in mid-April. In retrospect, the organisers now agree that combining meetings with S.M.A.E. events is not such a good idea – as interest is split over too many classes and all tend to suffer. This was certainly true at this particular occasion, although poor publicity might also have been contributory, and it is understood that the 'experiment' is unlikely to be repeated. Of the Northern Area events only the *Pannett Memorial Trophy* (for open power) could readily be doubled-up with a S.M.A.E. contest. Naturally, most entrants did exactly this. Although the day was never really windy, and most of the time had brilliant sunshine, there was only one treble in power. This came from Tom Smith – now willing and able to attend contest after being out of circulation for a number of years – flying a very impressive version of his familiar *Nig Nog* design. This is still the same size as the A.P.S. version, but now has a K. & B. 40R for power. In attempts to obtain the stiffness that Tom considers essential for consistency, this model uses a much thicker wing (nearly one inch deep) with silk covering, and a large-diameter glassfibre fishing rod section for the fuselage. All-up weight is 34 oz. (including an ounce nose-weight in anticipation of re-equipping with the promised schneurle-ported K&B). Although unnecessary for the *Pannett*, Tom flew-off in the S.M.A.E. contest only to be slightly off-pattern, 'change-over' badly, and then find good air for a respectable 4:29.

Tom Smith celebrated his return to the contest scene with a win in the Open Power event at the Pannett and Leeds rally. Model design is still the same size as his AeroModeller plan version, but is now powered by a K&B40 rather than the original Eta 29! Plans to fit the new K&B Schneurle-port 40 soon as available.

Runner-up in the *Pannett* was Russell Peers with one bad downdraught in his 8½ minute total. Mike Hargreaves was third with just under eight minutes, losing his model in the process. I suffered similarly to end up with a two-max score and my only model down in crops – a long, long way off the 'drome.

Rubber models monopolised the Vintage event. George Jennings made three steady flights late in the day with a *Korda Wakefield* to take first place with 7:23. I had flown early, with a *Scram* that climbed well but glided badly, to aggregate 7:10 for second place. Third was Ted Smales with 6½ minutes from his *Isis*. A/1 glider had rather low scores but was notable for being won by Mrs. Ann Godden – flying a model with *Syncopator* surfaces on a *Ronitube* fuselage. Only three seconds behind was Pete Redhead, using much strengthened *Aiglet* wings, again on a glass fibre fuselage. Third was Tony Cordes with, need I say, a *Little Hinney*. It would seem from inspection of the individual flight scores that the recent weight increase has made the A/1 very dependent upon lift for even respectable durations.

Coupe d'Hiver was a two-horse race between Henry Tubbs and myself. Being short of time through searching for my power model, I used the old *Hatband* for three flights, and then the 'delayed start' model for a fourth just before the contest closed. Although a flight short, this gave me sufficient score to beat Henry (who had very bad air on a couple of flights).

* * *

In the 'bigger picture' afforded by the S.M.A.E. Area-centralised events, it seemed that Elvington was hardly the place to have flown. Certainly the scores recorded in the National events were far from noteworthy (apart from

Tom Smith's 'Nig Nog' wings live in a 'Noah's Ark' jig when not strapped to the fuselage! This latter item now consists of a glass-fibre tube, while the wing has a thicker section and is silk covered – all in the interests of rigidity

Tom Smith) and placings were in keeping. From the reports received from East Anglia and the Southern Area, and from the final results, it is apparent that the weather was better in the South. Such variations across the country are, of course, almost inevitable – and however undesirable are part and parcel of the area-centralised concept.

The entry in the *Weston Cup* (for Wakefields) was good – perhaps due to it counting towards the *Plugge Cup*. It alsc looked as if a good percentage of the entrants completed their full quota of seven flights as scores, although not particularly high, tailed off quite slowly. The top positions showed that some regular contestants got 'their chance' at last – overall winner being Bill Houghton of Richmond with 20:13. In the past Bill's models have been characterised by their use of unconventional layouts and 'Melinex' film covering, but this description may not still hold. In second place, by just a single second, was Chris Chapman of Torbay, presumably flying at Woodbury Common and bringing a 'new' Area into the prize list. Tony Grantham and Geoff Lefever filled the next two positions and were the only others to clear 19 minutes. Incidentally, Geoff has joined those who use the Murray Stringer propeller assembly.

Both the Open events were topped by Brighton club members. Tony Child won the *White Cup*, for open power, with a fly-off that just cleared six minutes. Clubmate and friend John West was runner-up. Both were conspicuous at the Nationals with large and new versions of the *Ramrod*. Obviously intended for open fly-offs, it looks as if they may now have come into their own. Third in the *White* was Bob Bailey, still flying for St. Albans, but now re-domiciled near his club after a couple of season's exile in Bonny Scotland. All told these were exactly a dozen trebles out of 50 fliers.

Ken Winstanley won the Open glider contest (but not a trophy), again with a six-minute fly-off. Second was Steve Bowles who had to make a protracted tow at Watton before finding sufficient lift for around 5½ minutes. Jim Baguley and Ken Taylor were the only others to get 'assistance' on their fly-offs. Surprisingly only 10 fliers max'd out in this event – especially as there were all but 100 scores recorded! *Plugge* positions at this stage were Norwich, Crookham, and Southampton.

* * *

Slope soaring is a form of flying that has all but been taken over by the Radio fraternity – for pretty obvious reasons. The **Chester-Slope-Soaring** rally at Clwyd must be unique in still including a free-flight category, although even this has become increasingly dominated by magnet-steered models. Uncontrolled slope-soaring is largely a matter of chance, both in producing a model that will weathercock and in its subsequent flight. Any form of control provides a dramatic improvement, with magnet really being a half-way to radio.

Pre-publicity for this year's rally was all but non-existent, and the turnout for free flight was due largely to Paul Finn phoning all the 'local' magnet enthusiasts. Without this action by a *competitor* the free-flight contest would have been a non-event. As it was, it attracted a total of seven entrants, all with magnet models.

The Chester club had decided upon a three-flight event with a max to be decided on the day. As there was quite a stiff breeze blowing in a 'difficult' direction, some of the competitors suggested a low max and an increased number of flights – and this was adopted. Having experience of retrieving on (and in particular up) Clwyd's fern-covered slopes I would prefer less flights! After all, very modest flights can take a model well down the hillside.

In the event Trevor Faulkner demonstrated that he can practise as well as preach – and recorded a faultless string of five two-minute maxes. On the last flight he wound the D/T timer to the limit to try for the *Gosling Trophy* (best single flight, without max), drifted backwards above the main hillside, and finally D/T'd into a forestry plantation for 5½ minutes. Although this cost him the model, it was not enough to beat his clubmate, Jeff Palmer, who had earlier done 6:14, D/T'd and recovered. Jeff was less consistent, however, with one very poor flight, but still placed second on totals.

The top models naturally displayed certain similarities, and used approaches recommended in detail in Trevor's *AeroModeller* articles. His own model had a tubular balsa fuselage, and all-sheeted wings of Eppler section. Jeff's model was a little over A/2 size, weighed 20 oz., and had a tubular fuselage and Jedelsky wing structure.

At long last I managed to produce a magnet model for this event. Note that I did not use the word 'build', as it utilised the flying surfaces from my 1950 *Pothunter* open glider (renowned for its unique covering of *brown paper*, very much more practical than it sounds), and a rear fuselage cut down from a *Cargo Clipper*. The result was much larger than any other entry, and rather too 'new' to be predictable. Nevertheless, it was third overall and made the only flight recorded after the wind increased in the last hour of flying. Other competitors preferred discretion to completing their flights.

Having taken my magnet model out subsequently, and having it fly away O.O.S. upwind on a timer failure, I can vouch that magnets do work. (Yes, I did get my model back afterwards!) Contests under good conditions and on a better site than Clwyd should be both interesting and viable. But Clwyd itself has become an R/C meeting – logically enough since that side is well supported – and it seems that free-flight there has become something of an embarrassment to the Chester club. Although it lacked adequate direction this year, they do not want to drop the event, but it is poorly supported and the site has drawbacks. 'Solutions' have been solicited unsuccessfully in the past, but need to be found if free-flight slope soaring is not to disappear altogether.

* * *

The **Leeds** club held their F/F and C/L gala at Topcliffe on 24th June. There was an ambitious programme, on the free-flight side at least, with 'generous cash prizes guaranteed for all events'. Handouts listing the attractions had been

A/1 glider winner at the Northern Area Meet was Mrs. Ann Godden with a model using 'Syncopator' surfaces on glass-fibre rod fuselage. KSB dethermaliser timer used.

Left, Ray Sutton completed the long, long climb up from the top of the slope with his magnet-steered glider, featuring conventional wing structure. That's the only snag with slope soaring; retrieval is bound to incur a hard climb! Above, magnet enthusiast par excellence, Trevor Faulkner launches his model with which he won the Clwyd contest.

distributed at previous contests. Clearly the club intended their rally to be a worthwhile meeting.

After getting sunny weather last time the organisers must have been particularly dismayed at the rain experienced as people arrived and the contests were due to start. In fact, the rain soon cleared to give an overcast but calm day, that provided close to ideal flying conditions. For much of the day contest control was located almost in mid airfield, and it was only when models started to drift towards the hangars that the flying was re-located.

Thermal lift was intermittent and weak, a situation reflected in the A/2 scores. This event was flown to the full seven flight, but without rounds. There was no restriction on launching position until after the already mentioned movement of control. Then a downwind limit was introduced so as to keep models out of the airfield buildings. This decision caused complaints that as 'tactics' were now difficult, those who had started early were being favoured. It was also apparent that a couple of inconspicuous posts are inadequate to indicate such a limit. If restrictions are necessary then they should apply equitably and at all times.

Overall A/2 winner proved to be John Boon, with just one flight a little short of a max. His success came from much patient waiting, and a willingness to devote all day to the one event. He flew a fairly conventional glass-fibre rod design, exhibiting some *Wichita* influence, and fitted with a double D/T timer system. Second and third were Norman Duncan and Dave Greaves respectively, just one second either side of 20 minutes. Pete Stewart of Crookham was just a few seconds behind.

Other events to be decided without fly-off were chuck glider and vintage precision. The former was won yet again by Ewan Jones, just three seconds ahead of Barry Kershaw. Both were well ahead of Mike Gleeson, who was third. Vintage precision was a game of short flights. The idea is to total five times one's first flight, and the use of D/Ts was effectively discouraged by ruling that such flights counted as three minutes – whilst the initial flight had to be within 20 seconds and two minutes! Results are computed on a percentage basis and the winner, R. Ashby, must have been very precise to come within four per cent of his target. He flew a *Black Magic*, and was making flights in the 20-odd seconds region. Successive places went to T. Rushby flying a KeilKraft *Contestor*, and Ewan Jones with an ED Mk. 2 powered *Southerner*.

First fly-off was for vintage duration, and was between Frank Elton and myself, both flying *Scram* lightweight rubber models. I had solved my glide problems by adding surface turbulators to the wing, achieving an almost magical transformation! Unfortunately, when winding for the fly-off, the 'U' hook through the front bobbin detached itself from the winder! The results, although repairable, were past what could be attempted inside the fly-off period. This catastrophe gave the event to Frank despite his use of extra rubber and resultant bunch and stall-down.

The 'Mini' fly-off was another anti-climax, but at least it went my way. Tony Cordes had lost his one and only *Little Hinney* in crops several fields outside the drome following his second timer failure of the day. Both flights came down, but he could not locate the model the second time. Then on the actual fly-off Julian Hopper over-ran with his ½A model, to record a 'zero' and share second place with Tony. My flyover was a liftless 1:49 from my delayed release C d'H. With suitable correction, using the K factor of 1.3, this would have just failed to beat Julian's actual time on his over-run! On a bit less run, the outcome would have been very close indeed.

Fly-offs for open power and rubber were rather more satisfactory. It was calm enough for models to be timed down quite easily, so scores were both close and meaningful. The power event proved to be a clean-up for those with large glow motors. Winner was Tom Smith with the model described earlier, just ten seconds ahead of John Hook's O.S. 40-powered, standard-size *Woodpecker*. The designer flew his enlarged version with K. & B. 40 into third position. The longest fly-off of them all didn't count as Phil Ireland managed a 13-second run with one of his F.A.I. models, and reached a most impressive altitude!

Open rubber saw the 'home club' take the top two places, with Gerry Tideswell managing his first major success since he returned to the contest scene. Second was Henry Tubbs with a one-second margin over Mike Sanderson. The only others to clear the five-minute mark were John Carter, Mike McAskie and Joe Barnes. All told there were 16 trebles in this class – out of 22 recorded scores. Three-threes really is a formality in this sort of weather!

Results

THIRD S.M.A.E. AREA CENTRALISED EVENTS – 10th June 1973
Wakefield (Western Cup), 72 entries, 71 scores. 1. W. Houghton (Richmond) 20:13; 2. C. Chapman (Torbay) 20:12; 3. A. Grantham (E. Grinstead) 19:22; 4. G. Lefever (Norwich) 19:10. **Open Glider,** 105 entries, 98 scores. 1. K. Winstanley (Brighton) M+6:09; 2. S. Bowles (Norwich) M+5:35; 3. J. Baguley (Hayes) M+4:35; 4. K. Taylor (E. Grinstead) M+4:45. **Open Power** (White Cup), 52 entries, 30 scores. 1. A. Child (Brighton) M+6:01; 2. J. West (Brighton) M+5:37; 3. R. Bailey (St. Albans) M+5:22; 4. T. Payne (Northampton) 5:09. **Plugge Cup** (after 3 events). 1. Norwich 710 points; 2. Crookham 597 points; 3. Southampton 561 points.

NORTHERN AREA PANNETT-VINTAGE MEETING – Elvington, 10th June 1973
Open Power (Pannett Memorial Trophy), 7 flew. 1. T. W. Smith (B.A.C.) M+4:29; 2. B. R. Peers (Falcons) 8:27; 3. M. Hargreaves (Leeds) 7:55. **Vintage Duration,** 7 flew. 1. G. Jennings

(Leeds) 7:23; 2. J. O'Donnell (Whitefield) 7:10; 3. E. Smales (Blackburn) 6:31. **A/1 Glider,** 6 flew. 1. Mrs. A. Godden (Morley) 6:53; 2. P. Redhead (C/M) 6:50; 3. A. Cordes (Leeds) 6:06. **Coupe d'Hiver,** 2 flew. 1. J. O'Donnell (Whitefield) 7:34; 2. H. Tubbs (Leeds) 6:04.

CHESTER SLOPE SOARING RALLY, CLWYD – 17th June 1973

Free-flight-cum-Magnet, 7 entries (5 flights, 2 min. max). 1. T. Faulkner (Sheffield) 10:00; 2. J. Palmer (Sheffield) 8:10; 3. J. O'Donnell (Whitefield) 6:23. **Gosling Trophy** (best single flight without max) J. Palmer (Sheffield) 6:14.

LEEDS GALA, Topcliffe – 24th June 1973

A/2 Glider, 36 entries, 34 scores. 1. J. Boon (Falcons) 20:44; 2. N. Duncan (West Lancs) 20:01; 3. D. Greaves (Birmingham) 19.59. **Open Rubber,** 24 entries, 22 scores. 1. G. Tideswell (Leeds) M+5:46; 2. H. Tubbs (Leeds) M+5:36; 3. M. Sanderson (Grimsby) M+5:35. **Open Power,** 24 entries, 22 scores. 1. T. W. Smith (B.A.C.) M+5:45; 2. J. Hook (Southampton) M+5:35; 3. R. Peers (Falcons) M+5:25. **Chuck Glider,** 9 entries, 8 scores. 1. E. B. Jones (Sunderland) 4:26; 2. B. Kershaw (Wigan) 4:23; 3. M. Gleeson (Syke) 3:39. **Mini,** 13 entries, 12 scores. 1. J. O'Donnell (Whitefield) M+1:49; 2. A. Cordes (Leeds) and J. Hopper (Stanstead) M+00. **Vintage Duration,** 17 entries, 15 flew. 1. F. Elton (Leeds) M+1:21; 2. J. O'Donnell (Whitefield) M+03; 3. E. B. Jones (Sunderland) 7:52. **Vintage Precision,** 10 entries, all flew. 1. R. Ashby (Morley) 3:79% error; 2. T. Rushby (Grimsby) 4:61% error; 3. E. B. Jones (Sunderland) 6:84% error.

1973 BRITISH FREE FLIGHT TEAM CHANGES

A clarification

from John O'Donnell . . .

Much of this issue of *AeroModeller* will be devoted to a report on the World Free-Flight Championships. Hence it is particularly appropriate to discuss the changes that occurred in the British team, especially as I was personally involved.

First casualty was Bryan Spooner, whose job took him to Australia this summer. Not being able to be in two places at once he dropped out of the Wakefield team – his place being taken by Ron Pollard. This type of situation is always a possibility when trials are held a long time before the finals.

The replacement of John Mabey (Wakefield) and myself (A/2) is a rather sad story. What happened is controversial in its extreme, but can hardly be 'glossed over' without some sort of explanation – particularly as John and I did not surrender our places voluntarily.

Some six months after the trials, the SMAE told the top three in each event that they were officially approved as being in the team and that they might well have to pay their own entry fees on top of the travelling costs they expected to bear; the signing of a 'Team Members' Declaration Form' was also requested.

Although the financial aspects were a shock – the entry fee being approximately £28 (almost double that four years ago) – the real trouble came from the form. It contained the sentence *'I will accept the authority of the appointed team manager in all matters arising'*. Five out of the nine people involved amended this in one way or another – all being concerned about being told how and when to fly. Technique and timing is all important in present-day free-flight with its emphasis on thermal detection.

The SMAE Council Meeting of 19th May decided that improved finances would permit payment of the entry fees – but that 'defaced' forms were not acceptable. The linking of these two aspects is significant and disturbing. Even though the points raised by the team were accepted and it was agreed that the actual flying must be left to the flier, the Council *still insisted* that original wording on the forms would stand and that the team members must sign them *unaltered*. No explanation for this inconsistency has been advanced.

Being unwilling to 'sign away our rights' John Mabey and I again amended the (new) forms supplied. (The other three signed under varying degrees of protest – a token that does not affect their commitment.) The impasse continued until the end of June when SMAE chairman, Jack Hartley, wrote to say we would *'not now be included as a team member for the UK'* and that he was astounded that we should *'quibble at such a minor item'*. In short, we were sacked. Obviously I do not consider this to be a minor item otherwise I would not have been willing to sacrifice my chances of trying for the World Championship. There have been forms before, demanding varying degrees of preparedness, but the crucial sentence was not introduced until 1970 or thereabouts. This year's team received their forms in April. The SMAE rejection of amendment came in mid-May, a bit late to re-write the forms through the long-winded constitutional system of proposal from Areas, etc. Personally, I consider that if I am making my own travel arrangements and paying my own fares, etc., I should not be handicapped by being *bound* by an arbitrary requirement of blind obedience to *any* request by the team manager. Such a constraint would overshadow my attitude to the contest. The SMAE have said that such is not the intent, but they simultaneously demanded absolute compliance in the signing of the form. There is precious little logic and a great deal of petty officialdom in all this. Having witnessed past 'differences' between team members and managers I consider that some latitude in the SMAE requirements is essential. The whole SMAE attitude appears to be that of expecting the Manager to run the team. I believe that the reverse should apply, i.e. the manager should be a servant of the team, making mundane arrangements, sorting out problems and letting the fliers concentrate on winning the contest. Sharing out a round time to everyone's advantage is crucial, and demands the co-operation of the three people involved, not a mathematical division by decree.

I have made no secret about being interested primarily in the individual championship and only secondarily in the team award. This attitude is shared by about all British fliers of my acquaintance. Most claim that if individuals do well, then good team results must follow. The SMAE itself maintains that the team championship is the more important but does not act appropriately. Having helped to win the team award in 1965 I know how this success was received. Typical was the taking of 22 months to send me my souvenir award, hardly an indication of high regard.

The vacancies were filled by asking those next in line at the trials. Tony Cordes accepted the A/2 place readily enough – but Wakefield was not so easy. Dave Hipperson declined the chance through being too short of models. Sixth man at the trials, Jim Punter, accepted the team place at the price of some frantic building.

No doubt there will be those who will maintain that I got what I was asking for. Perhaps so – but I am far from repentant. There are some things in life that matter to me – an attitude not shared by several modellers who suggested that I sign the form and then *ignore* it'.

John O'Donnell
Marple, Cheshire

. . . and the S.M.A.E.

John O'Donnell's basis for supporting the refusal to accept the terms of the declaration form appears to be that he feels he has bought his right to compete in the World Championships as an individual. He has stated that he is only interested in his own performance and that the team championship is of little regard. He feels he should, therefore, have every right to fly when he wants and does not wish to be told when to launch.

He was advised in writing and verbally that the latter point would not arise: but he still found this inconsistent with the declaration and refused to acknowledge the authority of the team manager in all matters.

Just as the Royal Aero Club delegates its authority to the SMAE in such matters as World Championships, so the SMAE invests its responsibility in its appointed team manager.

The team manager has to care for the concern of not one but up to 12 individuals according to model class. In the case of free-flight there are nine, of whom three share the time allocated by the organisers of his particular event. It is the duty of the team manager to be able to recognise any circumstances which are likely to prejudice the team performance adversely and be ready to take whatever action is necessary. He must be thoroughly familiar with the regulations and co-ordinate the tactics of the team. That is a small part of his directive. Thus the first duty of the team manager in this particular case is to ensure that all the team members have a fair and equal opportunity to use the limited period of one hour per round.

This was pointed out to John O'Donnell but did not draw response.

It should also be mentioned that the chairman's letter did not 'sack' him from the team, but informed him that he was no longer on the team. By not complying with the SMAE requirements, he did not accept the position on the team. Completion of the form is a condition of acceptance.

The other side of the question is the principle of the form itself. Simplified in 1969 when the International Specification forms were revised. It was established to obtain a commitment to the Society responsible for entry of a national team. There are adequate means whereby such forms can be amended through constitutional procedure but the opportunity was not taken up. Nor did John O'Donnell do as people do with other forms to which they object: to sign, under protest.

No organisation can accept an amendment of a regulation or a long-established procedure without the sanction of its governing body. The 18-vote support of the chairman's action in this instance bears out the SMAE view that total authority must be invested in the Team Manager for each category of model flying.

R. G. Moulton
FAI Delegate, SMAE

FREE PLAN!

Need a more advanced model than a free-flight sportster, yet not ready for a really hot performer? Then try

CUDDY

Lots of wing area, straightforward construction, no 'frills', yet good performance from a 0.8 c.c. engine, diesel or glow

designed by TONY CORDES

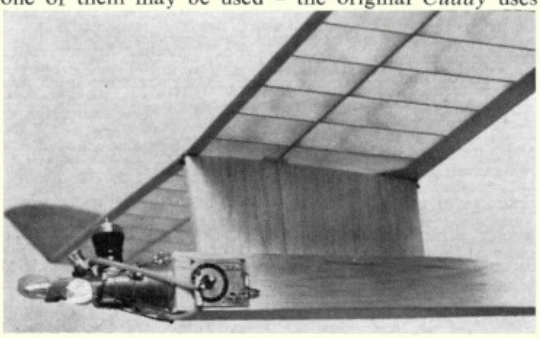
DOUBTLESS, THE best process for acquiring experience of building and flying contest power models is to start with an elementary kit such as the Veron *Cardinal* and then progress, via more advanced kit designs such as the KeilKraft *Halo* or *Gaucho*, to published designs and then perhaps on to one's own designs where all the accumulated knowledge may be culminated in one model. Unfortunately, few kitted designs are suitable for contest work, particularly as they soon become 'dated' when new techniques and equipment become generally accepted. Thus the budding competition flyer has to select his models from published designs – such as provided by the *Aeromodeller* Plans Service. In recent years published contest designs have become technically more complex; they require advanced building techniques, expensive, powerful motors and use V.I.T. (Variable Incidence Tailplane) and A/R (auto rudder). Although these complexities are necessary to be *really* competitive, they also form an effective 'barrier', especially to the younger modeller. This results in a fairly large drop-out rate among modellers who reach the stage where they want to progress from kits, but dare not. Designs, not beginners' designs but an intermediatory level are, in the opinion of the author, very necessary to fulfil the needs of that group of modellers just described, and thus perhaps foster an increasing interest in power flying.

Such a design must have sufficient performance to be competitive when flown sensibly (see trimming notes at end of article), but be relatively speedy and simple to construct and trim while being void of any gadgetry whatsoever. *Cuddy* represents such a design and should provide, if built correctly, adequate contest performance for the not fully experienced flyer. The original, when powered by a good 049 cu. in. glow engine, is capable of the three minutes required from the ten seconds engine run allowed.

Why choose a ½A design, and why choose *Cuddy* in particular? Firstly, because of their light weight and consequent lack of inertia, ½A models are quite robust and can withstand those unintentional power-on landings. Secondly, they are much less expensive to produce both materially and engine-wise. Finally, they are of reasonable size to transport and handle.

The *Cuddy*, at 280 square inches wing area, represents what is considered an upper limit in size for ½A design which, provided the total weight is kept around 7½ oz., results in a slow, floating glide and easily controlled power pattern. A flat bottom wing section is used which aids the power climb and provides easier trimming. The multi-spar flying surfaces provide adequate anti-warping strength and are preferable to the more time-consuming geodetic structures for this class of model, although the latter are very necessary, if not essential, for the more advanced contest power model. A simple box fuselage is used which gives maximum torsional rigidity for minimum building effort.

The obvious choice for the power unit is the Tee Dee 049/051, but a much more docile performance will be obtained with any other 049. A radial mount with the motor arranged vertically is used. Several radial mounts are available commercially and any one of them may be used – the original *Cuddy* uses



Close-up of the front end reveals motor sitting on a radial mount – in this instance the Tatone unit incorporates a tank. Engine shut-off timer is a useful insurance against over-runs, even for sports fliers.

a Tatone tank/mount.

For contest work it is best to use a clockwork timer, but as an inexpensive alternative, a glass eye dropper may be used. These may be purchased from Boots or any chemist's stores for a few pence. The dropper is simply strapped to the fuselage with a rubber band and the amount of fuel needed to give about ten seconds run may be gauged and marked. It must be stressed, however, that this is not a very accurate means of timing engine runs!

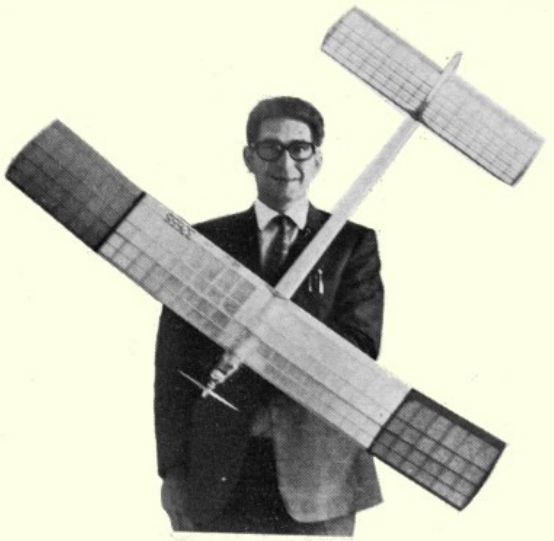
Construction

Start by building the wing so as to allow the maximum time for it to 'settle' while the remainder of the model is built. Assemble the L.E. from $\frac{1}{8}$ in x $\frac{3}{8}$ in. and $\frac{3}{16}$ in. x $\frac{1}{4}$ in. med. stock. Notch the L.E. and T.E. and pin down. Add all the ribs, taking care to angle those at the dihedral joints to give the correct dihedral (the ply dihedral braces may be of help here). The tip ribs are angled at 45°. Add all the top spars. Remove from the board, add the bottom spar, re-pin down, and glue in the $\frac{1}{32}$ in. sheet webs. Again remove from the board and carefully shape the L.E. and T.E., and using a file or sanding block flush the dihedral joints. Butt join the tips to the centre panels and butt join the centre panels together using quick-dry epoxy, checking that the dihedral dimensions are correct. Finally add the $\frac{1}{32}$ in. ply dihedral braces and all the $\frac{1}{8}$ in. sheet gussets. Cover with lightweight Modelspan tissue and give two coats of 50/50 dope and one of fuel proofer, *always* pinning down between each coat and carefully packing to give the correct warps.

Notch the tailplane T.E. and pin this and the L.E. down. Add all the ribs (the end ribs are angled at 45°) and use a set square when gluing in the centre ribs as they must be straight and square since they support the fin. Add the top spars, $\frac{1}{8}$ in. sheet gussets and $\frac{1}{4}$ in. sheet tailplane hook support. Remove from the board, add the bottom spars and complete by shaping the L.E. and T.E. Cover with lightweight Modelspan and finish as per the wing, again always pinning down.

Cut out the fuselage sides, top and bottom, from soft $\frac{1}{8}$ in. sheet. Pin down one side and add first the top and then the bottom, using a set square to ensure all is square. When dry, remove the pins and glue on the other side. Using a sanding block, square the front and back of the fuselage (and, if needed, epoxy the fuel tank in place), then epoxy the $\frac{1}{8}$ in. ply bulkhead in place. Block-in the rear and add all the 18 swg aluminium tubing. Glue in the snuffer tube and D/T hook.

Cut out the pylon ribs from $\frac{1}{8}$ in. sheet, making the bottom one $\frac{1}{4}$ in. shorter than the other. Cut to size the $\frac{3}{16}$ in. x $\frac{1}{2}$ in. T.E., $\frac{1}{4}$ in. x $\frac{1}{4}$ in. L.E. and the $\frac{7}{8}$ in. x $\frac{1}{8}$ in. former. Pin down the bottom rib and assemble upwards, always using a set square for alignment. When dry, roughly shape the L.E. and T.E. and add the $\frac{1}{16}$ in. sheet sides. Sand to a streamlined shape. Finally epoxy the $\frac{1}{16}$ in. ply wing mount in place, add the $\frac{1}{16}$ in. sheet fill-in, and glue the wing hooks in place. Cover the fuselage and pylon with lightweight Modelspan and give two coats 50/50 dope. *Do not* fuel proof at this stage. Epoxy the $\frac{1}{32}$ in. ply tailmount in place, angling it so that the tailplane is fitted parallel to the wing inner panel to give a *right turn*. Epoxy the pylon in place. Cut out and shape the fin, cover it with lightweight Modelspan, give two coats of 50/50 dope and glue it into the tailplane. Finally, give two coats of fuel proofer to the complete fuselage and fin. Add the nylon D/T line with a length to give a 45° D/T angle. Do not use knots in the nylon but instead use a short length of aluminium tubing which is slid over the nylon and crimped with pliers.



Simple, functional model is easy to handle, thanks to generous wing area which results in an excellent glide at the expense of some altitude. You can't win everything! Just the model for sports enthusiasts who need a better flier or for the newcomer to competition work.

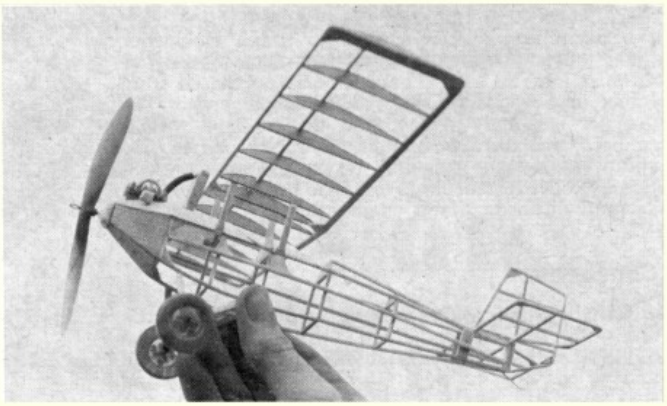
Before attempting to fly, assemble the model indoors and ensure everything is aligned, i.e. wing incidence and warps correct, fin lying in line with the fuselage C/L and correct tailplane tilt. If satisfied, add $\frac{1}{16}$ in. ply keys to the wing and tail undersurfaces to ensure that the flying surfaces are always attached in the same alignment every time. Add ballast if necessary to bring the C.G. to 1 in. from the rear of the wing.

Trimming

Pick a very calm day for trimming. Test glide and pack the tailplane until a flat glide with slight right turn results. It may also be necessary to alter the amount of tail tilt to achieve this, but *do not* use any rudder settings at this stage. From now on always use a D/T. With half power and a three-second engine run, the climb should be straight or slightly to the right. If so, all is O.K., a full power three-second engine run may be attempted. If not, then for too tight a climb to the right, increase the tailplane incidence, i.e. pack up the tailplane L.E., and use ballast to re-adjust the glide, or for a left tendency on the climb pack the tailplane T.E. and, as before, re-adjust the glide. When satisfied on half power, attempt a full power, three-second run. The resulting climb should be a fast spiral to the right with a climbing altitude of 50°-60°. If it is too tight try a touch of left rudder. This may be done by sticking a small piece of $\frac{1}{32}$ in. x $\frac{1}{8}$ in. packing, $\frac{1}{2}$ in. long, down the fin T.E. on the left-hand side. If the climb is too straight, reduce slightly the tailplane incidence. Avoid, if possible, the use of right rudder. When satisfied, gradually increase the motor run, making necessary adjustments as given above, until a full motor run is achieved.

FLYING SCALE COLUMN

by Eric Coates



Uncovered airframe of Peck Polymers 'Pietepol Air Camper' built by 14-year-old Mark Hudson – nice example of a 'Peanut' subject.

IN CONTRAST to Radio Controlled scale models which, despite the constant miniaturisation of their control gear, remain obstinately large, there has been a marked swing to much smaller F/F scale models in the last year or so. This has been most noticeable in the U.S.A. where for a long time now *Peanut* and other sizes of indoor scale flying has been flourishing. Generally, of course, the weather on the other side of the Atlantic is kinder to the small, light, outdoors scale machine, although the calm summer we have enjoyed here this year seems to have fostered much more interest in the small model. Although I cannot recommend these small jobs for serious outdoor competition work, they can be tremendous fun to build and fly. Being so small they can be completed relatively quickly, transported in an attache case (on public transport if necessary) and flown in public parks or quite small field.

The American model trade caters well for the miniature enthusiast: plans, accessories and kits are all available in profusion. Most of these are basically for rubber-powered machines, but the advent of the perfect power unit, i.e. the Brown Junior CO_2 engine which, alas, is not readily available yet, could change all this in a year or two. Fortunately quite a number of these items are becoming available to the British modeller, and I have received many samples over the last few months from the various importers. A number of these I have had built up, and in the course of the next few months hope to review them all.

* * *

To begin with I propose to start this month with a range of delightful 'Peanut' kits – **Peck Polymers.** The kits supplied for review being: *Pietepol Air Camper, Miles M18* and *Druine Turbulent,* all 12 or 13 in. span. Each comes in a sturdy box; a good feature for postal delivery. The two-sheet drawings are really excellent – the very simple construction is clearly detailed. The second sheet gives photographic stage-by-stage instructions and also contains a scale outline drawing for submission to scale judges – a very useful feature! All registration letters, numbers, etc., are depicted 'full size'.

The wing ribs, formers, etc., are very clearly printed on good quality, light grade $\frac{1}{16}$ in. sheet, while the spar and stringer material supplied is clean cut and again of the correct medium grade for this class of model. Three different colours of lightweight tissue are supplied in each kit.

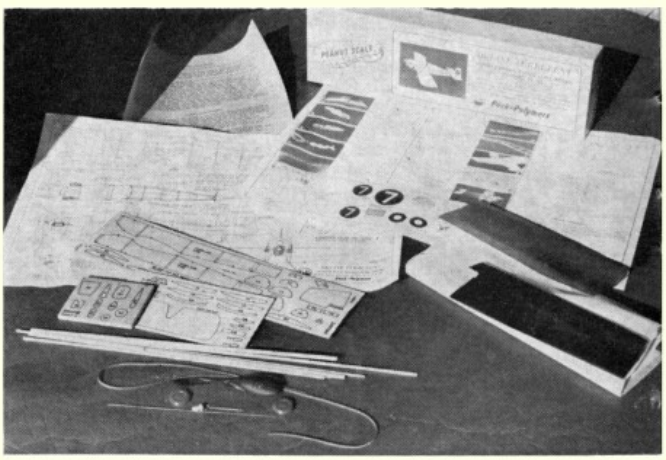
A beautifully moulded 4 in. diameter plastic prop, nylon nose bearing, washers and preformed prop shaft are featured, which should enable even the most inexperienced builder to produce a practical, working, nose-end. Lightweight plastic wheels, wire and rubber complete a really well presented kit.

Terry Manley built up the M18 and reported the construction relatively simple after the 0-400, his only point of criticism being the use of paper for the upper decking of the fuselage. He substituted $\frac{1}{32}$ in. balsa for a better job. I have no reports on flying yet, but I hope to witness a practical demonstration at Cardington shortly.

I entrusted the building of the *Air Camper* – a parasol home-build of 1931 – to 14-year-old Mark Hudson of the *Lee Bees* club, and again he reports very straightforward construction. Flight trials have yet to take place.

The kits are marketed in the U.S.A. by Bill Hannan and are available in G.B. via John Stennard (see advert on 'classifieds' page at back of magazine). The price is £1.50 each. This may seem a lot by British standards, but nothing comparable is offered in kit form in this country.

John also sent further samples of the Hannan range of plans. These include three more 'Peanuts' – *Demoiselle,* a *Fokker DVI* (this one by Walt Mooney



Spread of components for the Peck Polymers 'Druine Turbulent' reveals clearly printed parts on the good quality balsa. Instruction sheet is very informative and presents details of registration marks, etc., full size.

looks very attractive and makes a change from the DVII and DVIII), and a *Waterman Mercury Gosling*, a very simple parasol 1921 racer, again a design by Bill Hannan. On a larger scale is offered the *Fairchild 24*, 21 in. span, by Walt Mooney – this should be a really good flyer for calm evenings outdoors. Finally, we have the 1910 *Henri Farman* by Bill Hannan. This is certainly no beginners' model – the fuselage being completely open framed – but it should be a fine challenge to the pre- (14-18) war enthusiast.

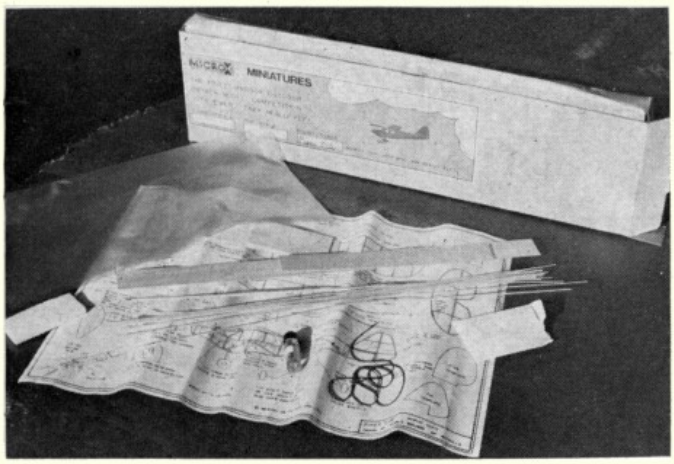
To go with these plans John also offers a range of plastic propellers – 4 in. and 5 in. *Kaysun* at 7½p each and the 5½ in. *Williams* at 15p. The 4 in. *Kaysun* is the prop included in the Peck-Polymer kits. Both are reasonably wide-sectioned blades, but by no means paddles as beloved by the British indoor flyer. The 5½ in. *Williams* is a modification of the prop supplied with the Brown Junior CO_2 engine and is very slim bladed. All should prove very efficient for powering light models, but none are capable of absorbing a great amount of power.

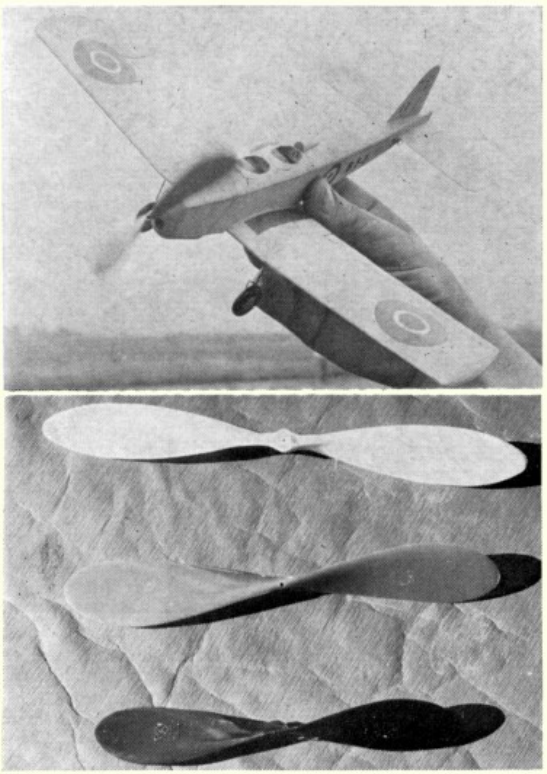
* * *

Definitely not for the beginner, but more for the experienced indoor duration flyer I would suggest, is the Peanut scale kit for the *Piper Cub* offered by **Micro-X** and available from Laurie Barr – whose advertisement will also be found on the classifieds page. Not really a kit, more on the lines of a mini 'Complete-a-Pac'. No printed sheet is provided, you have to trace your own formers and ribs from the plan on to beautiful quality lightweight Micro X balsa sheet. All longerons and spars are from 1/32 in. sq. (yes, not a misprint, 1/32 in. square!). A jar of Micro X Ultra Cement is provided for gluing, while the model is covered in condenser paper dyed, it is suggested, yellow. The all-up weight quoted on the plan is 2½ grams!

* * *

In complete contrast to the above, I have received two drawings for 28 in. span models from **Authentic Scale.** These are for a P.47 *Thunderbolt* and a *Hawker Typhoon*. Both designs are by that doyen of scale modellers, Harold Towner – in fact, they look to me suspiciously like revamped drawings of his old *Astral Ace* series of models kitted by that now defunct Leeds firm in the war years, but with the structure modified for balsa construction. Older readers will, no doubt, recall the painstaking structure used in the *Ace* kits when balsa was not available – this consisted almost entirely of 1/16 in. square obechi, with





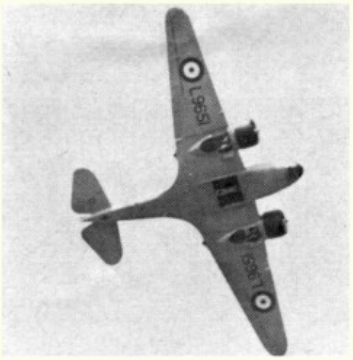
Top, yet another of the Peck Polymers 'Peanut' scale models, this time the Miles M18 built by Terry Manley. No reports of flight performances yet, but looks right! Above are a few propellers available to the rubber enthusiast: the larger is the Williams 5½ in. diameter item, below 5 in. and 4 in. version of the Kaysun.

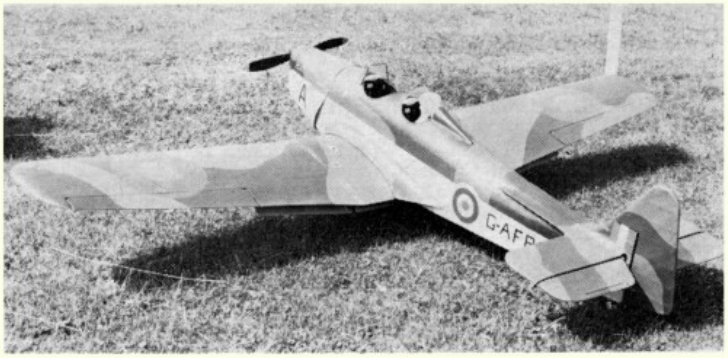
every former and rib built up! Building one of these, the *Typhoon* in fact, was where I first learned the thumbnail-nicking technique for sharp corners that I now advocate for wing tips and tail surfaces. Using balsa, these designs should build up into resonably light aircraft, but neither design is, of course, ideal for tissue covered, stringer construction. The P.47 is offered purely as a rubber-power design, and with the enlarged tail surfaces shown should have a moderate performance, but the huge draggy fuselage of the 'Jug' precludes any hope of prolonged duration. The *Typhoon* is shown basically as a control line model for around 1.5 c.c. engines. It is suggested on the plan that it could be flown F/F or single channel R/C, although I could not recommend either – it does not have the stability for anything other than C/L or multi R/C.

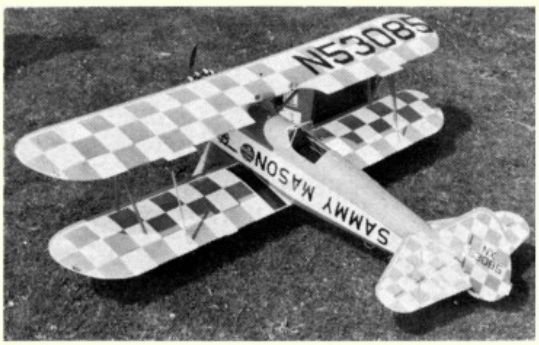
* * *

The 12th of August this year lived up to its true 'Grousemoor' image and really was a glorious day. Fortuitously the first of the **S.M.A.E. Scale Meetings** was held at Little Rissington on that date (the second meeting will be held at the same venue on September 30th. The sun shone throughout and the wind never exceeded 10 m.p.h. all day, indeed it was only of a minor hindrance to the F/F competitors.

Certainly out of the 'beginner' category is the Micro X 'Peanut scale' version of the Piper Cub. Kit consists of plan plus superb indoor quality balsa, but the latter is neither die-cut nor printed. One for those with delicate fingers!







Above left, Derek Goddard's superb C/L version of the Air-speed Oxford certainly does fly – most impressive too. Above, Mick Staple's superb Miles Magister, flown at the 1972 World Champs, took top place at the Rissington meet. At left, dazzling appearance matched by equally dazzling flight performance – Dave Day's Stearman PT17 which took the Class II scale award at the same contest.

The R/C was the first meeting held to the new Class II rules – the full-scale schedule now has to be flown and a slightly more searching static examination of the model is made. I think the new rules reflected a somewhat higher standard of model than has been seen in late Class II competition. The event, which attracted 11 entries, was won by Dave Day flying a *Stearman PT17*. Finished in orange and white checkerboard it looked very fine performing aerobatics against the blue sky background. Second place went to G. Dodwell, whose well-known *Sea Fury* (published in the September issue of *R.C.M.&E.*) fitted with retract gear always flies impressively. How much better a fighter looks with its wheels tucked up than the all too common sight of a permanently fixed U/C machine performing aerobatics at a *scale* speed which would have torn both legs off! Third place was taken by C. Moss with an attractive *Stampe* biplane.

Control Line attracted a good entry of ten, all of which flew. The event was narrowly won by Mick Staples, whose high static score just managed to keep him in the lead despite a modest flying mark. Conversely B. Perry's spirited flying of his aerobatic *Fairey Junior* lifted him into the second slot.

Derek Goddard overcame the engine troubles which have plagued him this year to allow him to fly his massive *Oxford* into third place. Airborne, I think the 'Oxbox' is one of the most impressive control line jobs I have seen. With cockpit and engine detail, and a retracting U/C fitted, I feel this model could be a potential world champion.

The Free Flight event was very poorly supported. Several well-known regulars were known to be on holiday, and many more seemed content to just sports fly in the attractive surroundings, so only four entries were forthcoming.

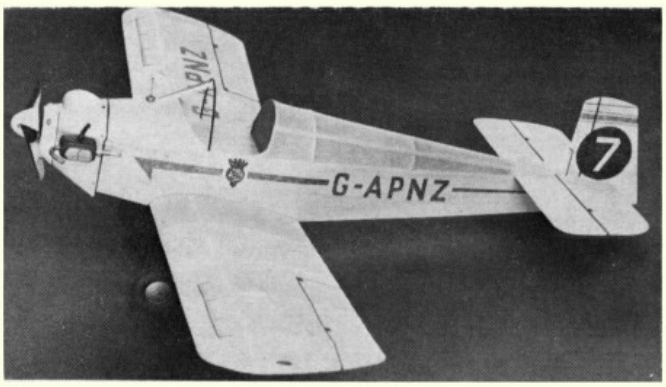
The honours went to your scribe flying the '9a'. Second place went to Dick Hibbert, whose *Blackburn Baby* made a marvellous take-off from its dolly.

Very nice . . . the Peck Polymer 'Druine Turbulent' ready for the 'off' shows the degree of realism that can be achieved with these lightweight rubber-powered miniatures.

Bringing up third place was J. Gray, whose *Fieseler Storch* refused to R.O.G. due to a 'cooking' D.C. Merlin. From a hand launch, however, it went straight up, weathercocking into the breeze, making no forward headway at all. Unfortunately, when the motor cut, it spiralled straight down into the runway, from which it had refused to rise, shortening the fuselage somewhat!

Results:

Radio Control	**Scale Pts.**	**Best Flight**	**Total**
1. D. Day *Stearman PT17*	920	766	1686
2. G. Dodwell *Sea Fury*	730	797	1527
3. C. Moss *Stampe*	715	761	1476
Control Line			
1. M. Staples *Miles Magister*	726	325	1051
2. B. Perry *Fairey Junior*	326	716	1042
3. D. Goddard *Oxford*	452	568	1020
Free Flight			
1. E. Coates *D.H. 9a*	784	960	1744
2. R. Hibbert *Blackburn Baby*	402	640	1042
3. J. Gray *Fieseler Storch*	398	400	798



GOLDEN WINGS AEROMODELLER MODEL CLUB

Are you between 10 and 16 years of age? Then don't delay, join today

JUNIOR POSTAL KIT CONTEST RESULTS

THE RESPONSE to this contest, held on 4th/5th August 1973, was not really very good as only 16 entries were received, and two of these were not valid. Once again the response is inconclusive because the weather in general was poor and, indeed, the Sunday had rain all day in many areas. So is the low entry due to lack of interest, or bad weather, or something else altogether?

The clear winner was Alex Cameron (age 14 years 2 months), with a total of 736 seconds using the naked eye (and 1002 using binoculars). As the rules did not specify whether or not binoculars could be used we would have been in a bit of a quandary had not Alex's lower total been better than anyone elses! It just goes to show that all rules have loopholes however much the organisers try to cover every point. You may recall that Alex Cameron also won the *Junior Kit Contest* with his **Mercury** *Swan* at this year's Nationals – so he had a profitable year. His 736 seconds was made up of 2 minutes 59 seconds, 5 minutes 2 seconds and 4 minutes 15 seconds, which bears out his comment that there was 'excellent visibility and plenty of lift' at Ashdown Forest on Saturday, 4th August. Having seen Alex record over a minute consistently at the Nationals with no lift about, we have no doubts about these very good times. Well done! (By the way, Alex lost his model on the last flight, and with the binoculars the time out-of-sight was 6 minutes 58 seconds! He later sent us a post card saying that the model had been found, undamaged, eight miles away at Tunbridge Wells.) So the first prize of a **KeilKraft** *Aquarius A/2* glider plus a year's free subscription to *Aeromodeller* goes to him.

Second prize of a year's subscription to *Aeromodeller* is awarded to 10-year-old Mark Gibson of Jarrow with 299 seconds. This was made up of three remarkably consistent flights – which is the way to the top.

Third prize of a £1.50 voucher for M.A.P. books/plans goes to David Worsop of Ipswich, who is 16 years old. He flew with a friend (who came fourth) at Martlesham Heath on 4th August, and both sent in a combined card efficiently signed by a third person.

The remaining results are listed at the end of this article, but before we get to them some other points are perhaps relevant.

Firstly, two entries had to be rejected because they were flown on the wrong days. One from Scotland was postmarked 24th July (!) and the other very honestly said that he had flown on the 6th August because the weather was bad on 4th and 5th. Well, we are very happy that you flew, David Merriman of Swansea, and congratulate you and Gavin McCutcheon of East Kilbride for achieving very good times, but I cannot allow your entries as the rules were very clear on this point. The weather is part of the game and it would be unfair to bend the rules this far – hope you understand and have better luck next time!

Those who chose Saturday the 4th seemed to have done better than those who chose Sunday the 5th (which we can well understand, having watched non-stop rain in the London area on that day!) In fact, the most amusing card was from Graham Moore's father who sent in a blank card for his son with *'It rained all day, mate!'* on it! Thanks for acknowledging your support for the contest, Graham – sorry about the weather!

All these times are very good when judged against the weather conditions. If you can *consistently* top 60 seconds from a 164 ft. line whatever the weather then you are doing very well indeed. Let's see you at the South Midland Gala on 23rd September – control line fliers too!

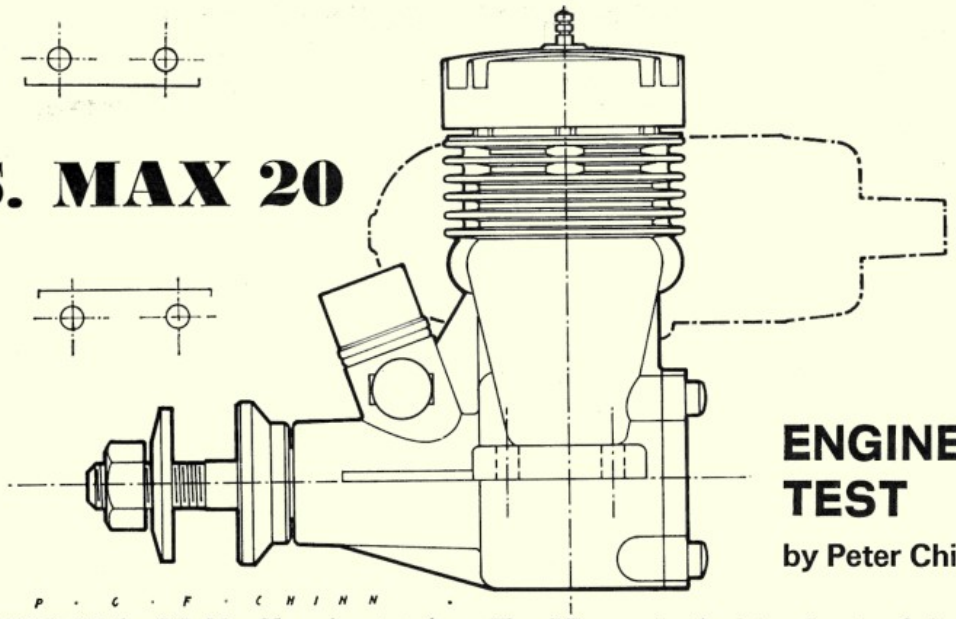
Finally, a special thank you to Flt. Lt. Zotov who organised the five entries from Watton airfield and who made out some excellent postcards beforehand, nicely typed, with blanks for names and times. It doesn't improve performance, but it does help the contest director!

Shall we repeat the contest (with a different model perhaps) next year? Have you any changes to suggest? Write in to let us know.

	Name	District	Age	Date Flew	Flight Times 1st	2nd	3rd	Ttal (Scs)
1	A. Cameron	Crawley	14 yrs 2 mths	4th Aug.	179	302	255	736
2	M. R. Gibson	Jarrow	10 yrs.	Not stated	106	97	96	299
3	D. Worsop	Ipswich	16 yrs. 2 mths.	4th Aug.	79	104	105	288
4	K. Stubbs	Cheadle Hulme	14 yrs. 5 mths.	Not stated	120	70	60	250
5	D. Goddard	Ipswich	14 yrs. 9 mths.	4th Aug.	96	84	50	230
6	J. Maddison	South Shields	14 yrs. 5 mths.	Not stated	64	73	61	198
7	R. Cedar	London	14 yrs. 8 mths.	Not stated	78	47	55	180
8	A. D. Fleming	Helensburgh, Scotland	12 yrs. 1 mth.	Not stated	53	45	59	157
9	J. C. Rogers	Malvern	12 yrs. 8 mths.	Not stated	58	48	31	137
10	N. Hopper	Watton	11 yrs. 9 mths.	5th Aug.	40	44	30	114
11	P. Ashenden	Watton	11 yrs. 8 mths.	5th Aug.	23	39	33	95
12	S. Morris	Watton	11 yrs. 8 mths.	5th Aug.	41	36	–	77
13	A. Longman	Watton	12 yrs. 9 mths.	5th Aug.	32	–	–	32
14	D. Harrison	Watton	15 yrs. 3 mths.	5th Aug.	22	–	–	22

Ninety-one, ninety-two, ninety-three. . . Piers Coleman puts on the turns for Robert Rearden, both of Cheltenham MAC, ready for a test flight prior to the Nationals Junior Kit Contest.

O.S. MAX 20



P · C · F · CHINN

ENGINE TEST

by Peter Chinn

PRODUCTION OF the O.S. Max-25 engine started at the beginning of last year, following the successful launching of its smaller brother, the Max-20. Outwardly, these two motors look almost identical. In fact, apart from the '25' stamped on the crankcase casting, the only external difference is the slightly taller cylinder head of the larger displacement model.

SPECIFICATION
Type: Single-cylinder, air-cooled, glowplug ignition two-stroke with crankshaft rotary-valve and bushed main bearing.
Bore: 18.0 mm. (0.7086 in.)
Stroke: 16.0 mm. (0.6299 in.)
Swept Volume: 4.071 c.c. (0.2485 cu. in.)
Stroke/Bore Ratio: 0.889:1
Checked Weights:
155 grammes ± 5.47 oz. (less silencer)
192 grammes ± 6.77 oz. (with OS-702 silencer)
GENERAL STRUCTURAL DATA
Pressure diecast aluminium alloy *crankcase/cylinder-casing/front housing* unit, with phosphor-bronze bushed main bearing and detachable *rear cover* secured with four Phillips screws. Case-hardened steel counter-balanced *crankshaft* with 10.5 mm. dia. main journal, 7.6 mm. bore gas passage and 5 mm. o.d. hollow crankpin. Machined aluminium alloy *prop driver* keyed to flat on shaft. Lapped Meehanite c.i. *piston* with straight baffle and two 5 mm. i.d. skirt transfer ports. Fully-floating case-hardened 4 mm. dia. tubular *gudgeon-pin* with brass pads. Machined duralumin *connecting-rod* with oil hole at lower end. Steel *cylinder liner* closely fitted to main casting, located by flange at top and secured by cylinder head. Pressure diecast and machined aluminium alloy *cylinder head* with cast-in brass thread insert for glowplug, recessed soft aluminium gasket and fitted to cylinder casting with six Phillips screws. Machined aluminium alloy interchangeable carburettor *venturi inserts* retained by plated brass spraybar assembly with flexible needle-valve extension. Beam mounting lugs.
EXTRAS INCLUDED
(i) Large choke venturi
(ii) O.S. OS-703 Expansion chamber silencer with 6 mm. i.d. (28 sq. mm.) outlet, weight 36.8 gr. (1.30 oz.).
OPTIONAL EQUIPMENT
(i) Extra large (7.6 mm. i.d.) venturi.
(ii) Crankcase outlet nipple for pressurised fuel supply for use with above.
(iii) O.S. Type 21 throttle carburettor.
TEST CONDITIONS
Running time prior to test: 1 hour
Fuel used: (i) 25 per cent Duckhams Racing Castor-oil, 75 per cent methanol (running in).
(ii) 5 per cent pure nitromethane, 20 per cent Duckhams Racing Castor-oil, 75 per cent methanol (tests).
Glowplug used: O.S. No. 7 platinum filament.
Air temperature: 18 deg. C (65 deg. F).
Barometric pressure: 30.25 in.Hg.
Silencer: OS-703 as supplied.

The differences in the internal parts of the two engines are mainly attributable to the increased bore and stroke of the 25. Cylinder bore is 18.0 mm. instead of 16.8 mm. and piston stroke is 16.0 mm. compared with 14.6 mm. for the 20. The result is a 25.8 per cent increase in swept volume, from 3.236 c.c. to 4.071 c.c., accompanied by a slightly higher stroke/bore ratio. The weight of the 25 is no greater: indeed it is fractionally lighter, due mainly to its slightly thinner cylinder liner wall.

Like the 20, the 25 is boxed complete with OS-703 silencer and an optional, larger venturi insert. The standard (or 'S' type) venturi insert fitted to the engine is intended primarily for C/L stunt use and offers an effective choke area of 10 sq. mm. to ensure plenty of fuel suction. The alternative 'L' type venturi has a larger throat (6.9 mm. bore) which, after allowing for the spraybar, gives an effective choke area of approximately 17 sq. mm. This larger choke size is for use in competition free flight and other installations where more power is desirable and where some reduction in fuel suction can be tolerated. As an optional extra, the factory also offers a still larger venturi (7.6 mm. throat and 23 sq. mm. effective choke area) plus a backplate nipple for fuel tank pressurisation. This setup is favoured in Japan when the motor is employed in the C/L combat and R/C combat classes flown there. At the moment, these fittings do not appear to be available from KeilKraft, the U.K. O.S. distributors, and our tests on the Max 25 were therefore carried out with the small and large venturi inserts only.

The silencer supplied with the 25 is the OS-702 type expansion chamber. Since it was introduced for the 15, 19 and 20 engines, the OS-702 has had its tailpipe size increased from 5 mm. i.d. to 6 mm. i.d.

Like all the other O.S. Max engines, the 25 is a well designed and finely engineered motor of excellent finish. It is a versatile engine that can be used equally well for control-line (including stunt work) or free-flight, or it can be converted to radio-control use by fitting the appropriate O.S. Type 21 carburettor.

Performance

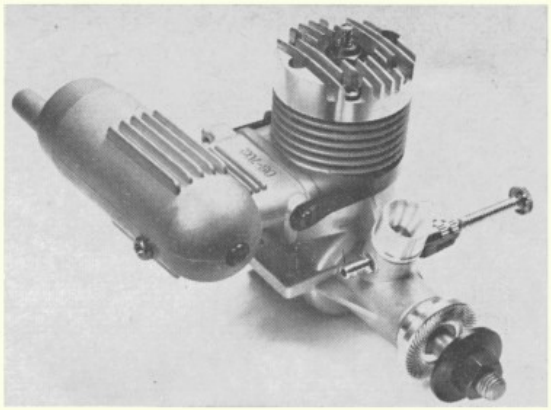
Two examples of the Max 25 were received for test. They were given a preliminary running-in period of twenty minutes and then checked on a 9x4 prop. Performance at this stage was very evenly matched; one engine proving to be just about 1 per cent faster.

This motor was given a further 40 minutes running time and set aside for testing.

Like many imported engines, the Max 25 is sold in the U.K. without a glowplug. The recommended O.S. glowplugs for the Max 25 are the No. 3 and No. 9 plugs, or, in the case of the throttle equipped version of the engine, the No. 7 or No. 9. The No. 3 plug is not at present obtainable in the U.K., the distributor offering only the No. 7 or No. 9. We tried the No. 9 which has been found to offer excellent performance and long life in the larger O.S. motors and in a number of other engines, but we found this plug to be a little too cool under the prevailing conditions for the Max 25, especially on straight methanol/castor fuel. It resulted in a slightly sensitive needle and a tendency for the engine to reach its full performance only after half a minute or so of warming up. Any attempt to lean the mixture out for higher speed immediately after starting would cause the 25 to cut. We therefore changed to the No. 7 plug. The 25 was clearly much happier on this: the needle-valve sensitivity was completely eliminated: the engine started from cold on its running setting and was about 200 r.p.m. faster.

The 25 was first tested with its standard (stunt) venturi and the OS-703 silencer (see curves marked (1) on the graph). Next, the larger venturi was installed and a further series of tests (2) were run. Finally, the silencer was removed and readings (3) were taken to determine the engine's gross output. As will be noted from the performance curves the respective power output figures for these three conditions were just on 0.34 b.h.p. at 12,000 r.p.m., 0.38 b.h.p. at 14,000 r.p.m. and 0.44 b.h.p. at 15,000 r.p.m.

These are very good figures and exceptionally so for an engine which, at 5¼ oz. bare weight, is lighter than most 19's. There is, of course, still more power to be had, should the user need it. We would expect the gross output to be pushed well over the 0.50 b.h.p. mark with fuels containing 25-30 per cent nitromethane and even higher with the optional extra large choke venturi and pressure feed. However, for the majority of users, the engine in stock condition on mild fuel has more than adequate power. The Max-25's appeal, in fact, is that for the weight and overall dimensions of a typical glow 19 (or even a 2.5 c.c. diesel) it offers a substantial bonus in power without having to resort to expensive or hard-to-get high-nitro fuels. Thus, the Max-25 *with an effective silencer*, gives a power output that is equal to, or better than, most good .19 class engines *without* silencers.



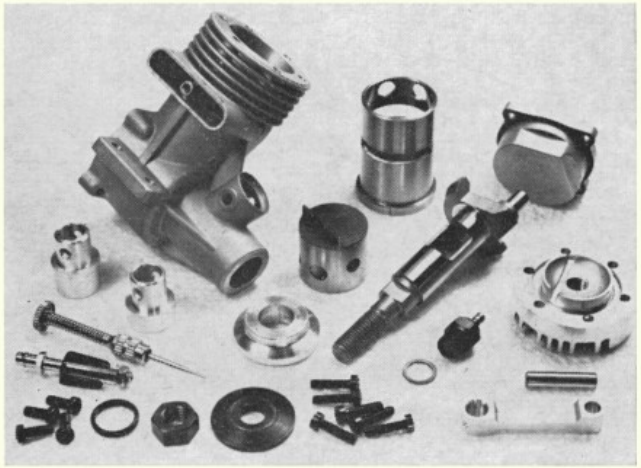
In its mildest form – i.e. with the small (10 sq. mm.) stunt venturi fitted, plus silencer and running on 5 per cent nitro fuel, the Max 25 turned up 9,400 r.p.m. on a 10x5 Super glass-nylon, 9,900 r.p.m. on a 9x6 Taipan glass-nylon, 11,300 on a 10x3½ Top-Flite wood, 11,700 on a 9x4 KeilKraft nylon, 12,000 on a 9x4 Top Flite nylon and 12,800 on an 8x6 Power-Prop standard wood. By using the larger (17 sq. mm.) venturi and removing the silencer, these figures were raised by 500 to 1300 r.p.m.

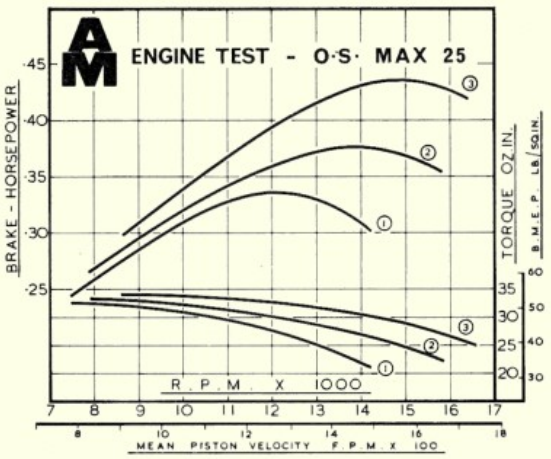
As regards prop sizes, we would suggest a 9x5 or 9x4 as being reasonably well matched to the 25's peak output when using the silencer and stunt venturi. With the larger venturi, the engine will, of course, turn these props faster, but, to take full advantage of the extra power then available at still higher speeds, it may be better to try slightly smaller dimensions, e.g. 9x4, 8½x5 or 8x6. The 25 will, nevertheless, turn a wide variety of prop sizes at useful speeds and can quite happily cope with a 10x5 or even 11x5, if such should be required for a large lightweight model.

The general handling and running qualities of the Max 25 left little cause for complaint. Cold starting was very easy and warm restarts were only slightly less immediate. In spite of having over 25 per cent greater cylinder swept volume for the same bulk and weight as the Max 20, vibration levels did not appear to be markedly increased.

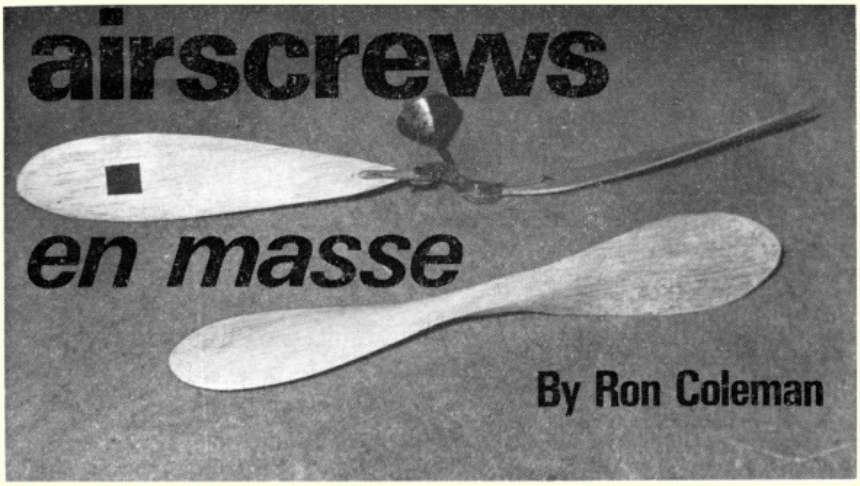
Power/Weight Ratio (5 per cent nitromethane fuel).
0.80 b.h.p./lb. with silencer and small venturi.
1.28 b.h.p./lb. less silencer, with large venturi.

Specific Output (5 per cent nitromethane fuel):
83 b.h.p./litre with silencer and small venturi.
107 b.h.p./litre less silencer, with large venturi.





airscrews en masse



By Ron Coleman

Part 5: (conclusion)

Carving from block continued

Completed, carved and glasspapered, the propeller blank is shown before balancing and fitting of hub bearings, plates, etc., and is compared with a larger, laminated folding item which employs a hub detailed in Part 3.

THE SELECTED balsa block should be square on all faces and have the plan view of the blade shape using either templates or carbon paper to achieve this as previously described. Ensure that one side at least is at 90° with the face front. Preferably use a pillar drilling machine for the shaft hole at the hub – drilled from the back so that the front face goes on to the drill table. If you do not have access to such equipment, then be very sure that your hand-drill is exactly vertical – ask a friend to 'guide' you accurately. Now the blank has to be cut out of the block, keeping all faces square. There is no better instrument for this than a bandsaw machine having a narrow blade. Perhaps the lone aeromodeller will not appreciate this so much because a bandsaw is not generally available, but it is remarkable how many friendly foreman there are in the wood working industry who might be able to help! A jigsaw machine is the next best thing, if it is sturdy enough to cut a thick blank, otherwise, the job has to be done by hand, using tenon saw, sharp knife, coarse glasspaper and plenty of 'elbow-grease'.

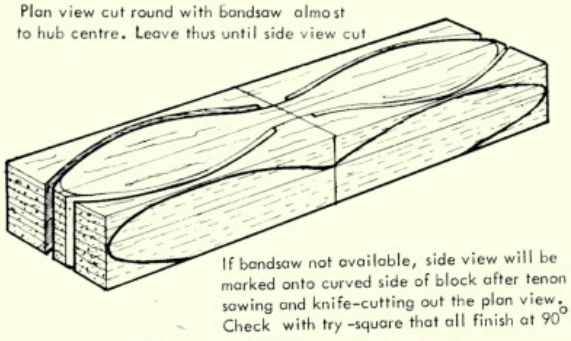


Figure 1 – Cutting out the blank

Cut out the blank as shown in Fig 1, i.e., cut round with bandsaw or any other means almost to the hub, then come back and cut completely around the side view. In this way no inaccuracies occur such as if the plan view were cut completely around, and the side view would have to be marked on the curving side, with consequent shortening of the template if applied direct to the wood.

Fig 2 shows the blank cut out and ready for carving – the diagonal saw cuts make the removal of the mass of wood so much easier. Cut the wood away in long sweeping strokes and try to appreciate in advance any changes of grain direction; i.e. do not always cut from the one place. Towards the later stages of the knife work, shavings are taken off in various directions, conforming to the blade twist. Remove the wood right down to the lines – keep the blades flat but follow the twist, then gradually shave down the tips and take off the angle at the maximum camber line. Now begin to slim down the hub; and carefully shave away for the beginnings of the undercamber.

It goes without saying that the knife must be SHARP. Balsa is a 'spongy' type of wood and nothing but the keenest edge will give satisfactory control in the carving process, so have an oilstone and a leather strop handy. It is best to use a thin-bladed knife, flexible to a certain extent. An old non-stainless steel table knife, ground to a taper, is ideal.

If you have no bandsaw available, then use a stiff-backed saw to cross cut through waste down to line marked – this makes waste removal easier.

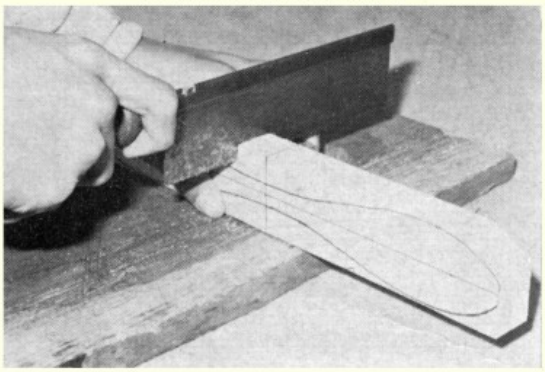
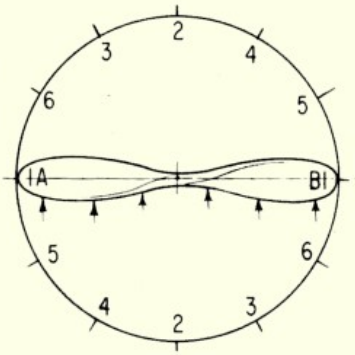
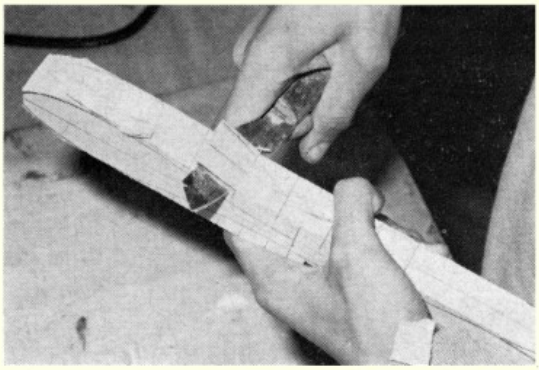
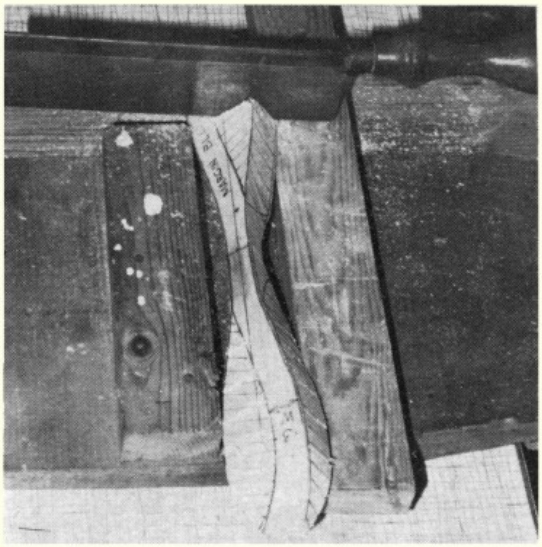


Figure 2 –

Balance at 1–1 Reversing 'A' for 'B', then at 2–2, etc. Often one side is heavier, causing airscrew always to return to the same position. Remedy is to ensure 'A' will reverse with 'B' in all positions. The arrows indicate the heavy side when 'A' will not reverse at position 1–1.

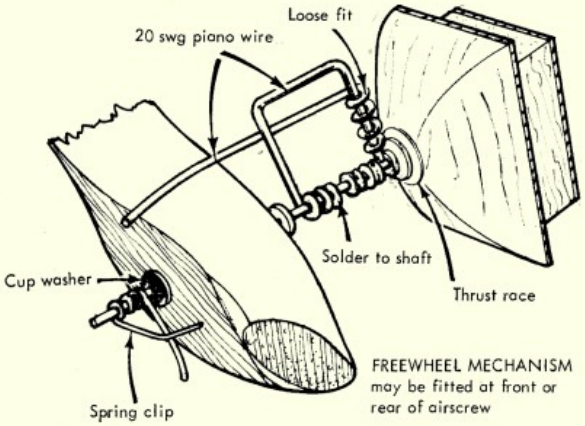






Above, chipping out the waste to make the square-edged propeller blank. Take care to find the grain direction early on, so as not to over-cut and spoil the shape. At right, roughing out the final shape. Mark off the 1/16 in. margins on the blade rear, and 1/3rd of blade width at front, plus maximum camber line. Saw down to margin lines every ¾ in. along blade length.

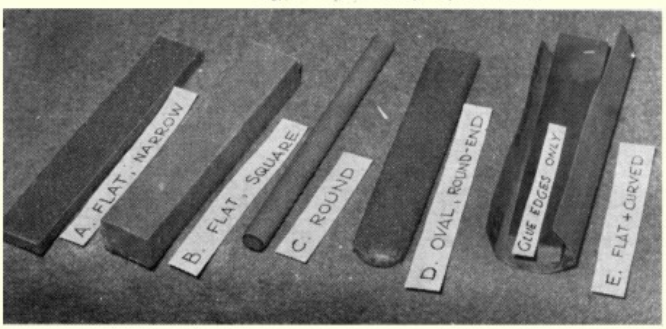
Figure 3 – Freewheel mechanism



Glasspaper work

The remainder of the shaping is carried out with glasspaper. Make a number of glasspaper sticks as illustrated and, starting with the coarse ones, work the blades down until the section templates begin to show signs of fitting over their respective stations which should be kept marked at the leading and trailing edge all along the blades. If not using section templates, then we have to go by 'touch' to tell when the blades are thin enough, and whether they are accurately matched. Use a fairly broad half-round glasspaper stick to scoop out the

A selection of sanding sticks should be made up to aid shaping the blades. With stick A, use coarse and medium grades of glasspaper, medium and fine with stick B. Stick C is useful for trimming up undercamber and tip work when used with medium or fine grades. For the same purpose, stick D has been found most helpful. Stick E has one rounded surface, one flat – note how glasspaper is glued at edges only for easy replacement.



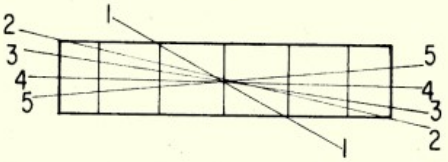
undercamber. It is more important to match the blades than it is to stick to the actual section.

If we have been careful with the drawing work, and have not rushed the shaping, we shall be rewarded by the ease and smart appointment of the section cards as they begin to 'click' into place along the blades. We shall know, at the end, that one blade really is the same size and shape as the other, within the limits of ordinary methods.

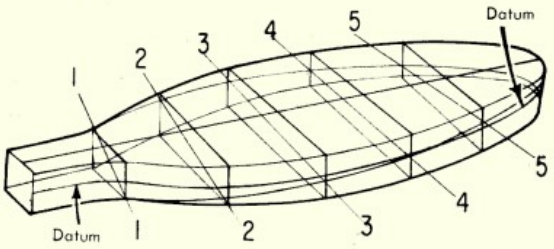
What is also pleasing is that the final balancing (after fitting free-wheel bush; shaft bush; plywood faces etc) is carried out in record time. By templates the blades are made very nearly the same weight; generally it is the freewheel pawl or bush which makes the difference and has to be allowed for. Fig 3 shows a good freewheel mechanism which does not weaken the airscrew hub, and allows for easy interchange of props – useful for vintage duration models.

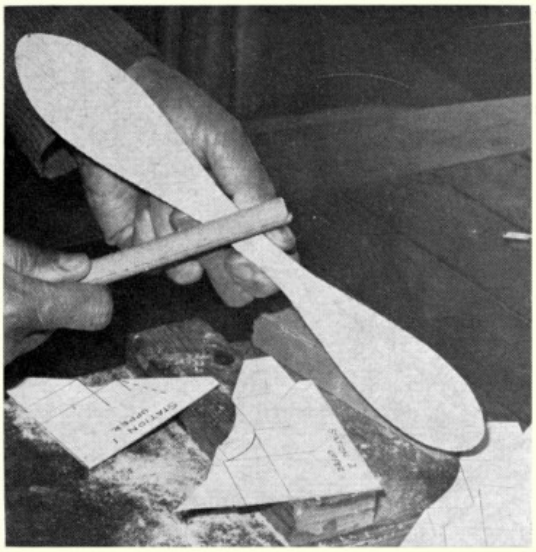
Balancing, smoothing off, final section checks and the fitting of hub bearings etc. are operations which must be worked one with the other. The airscrew cannot be balanced until a smooth bearing complete with ply reinforcements is fitted. The hub cannot be glasspapered off completely until after the ply faces are set while absolute balance is delayed until the finish is applied, when a coat of dope or banana oil on the lighter blade will often cure the fault. Study Fig 2 carefully. Final balancing of laminated airscrews dealt with in the previous articles is carried out in the same way – it is necessary to retain folding blades in the 'out' position with elastic bands of equal size,

Figure 4 – Setting out pitch angles



The precise pitch angles should be measured by protractor from Figure 1 (Part 4), Plotted as above on end view





Left, with cross-cut sawing completed, waste material is cut away right down to the margin lines. Sharp blade is essential to prevent 'digging in'. At right, using the round glasspaper stick to shape the rear of the hub.

or cotton thread, bound over the spigot and hub ends. Balancing can be the most tedious part of making model airscrews, especially if timber of uneven density has been used. In some cases it is necessary to sink small lead weights into the light blade, but careful selection of wood will avoid this more extreme remedy.

Carving from thick sheet

Some aeromodellers prefer to carve separate blades from balsa sheet about ½ in. or more thick. This is a more economical use of balsa wood which is not a cheap commodity, and if the blades are to be folded it does seem to be the best way.

It is necessary to set out the change of pitch angles at each station as in Fig. 4 and from this drawing, plot the vertical distances about a central datum line drawn around the edge of the blade blank. Draw a smooth curve through all the points and let this line be the line of the undersurface of the blade. Mark a second line 1/16 in. above and parallel to this to which the top surface can be carved – it is disastrous to accidentally carve the edges of the blade to a knife edge. Note the maximum camber line is at approximately 30% of the chord, from the leading edge (see Fig. 5).

It will be necessary to have the pivot holes drilled at the correct angle by means of a jig similar to that described in Part 3 for laminated blades. Hardwood hub insets, or beech dowel hub insets should be used, or thin plywood facing reinforcements, together with brass or aluminium pivot bushes are useful alternative treatments for the blade roots.

Finish

Some form of protection for the tips of the blades is advisable, see Fig. 6 for two methods. There is room for experiment with surface finish. A coat of dope to lay the grain followed by a light rub down with glasspaper, then dope on Modelspan tissue to make a good serviceable finish. Use banana oil for waterproofing. For a really light job, one coat of banana oil and a light glasspapering is sufficient. Indoor models might have blades formed on a tin can or wood mould (see Parts 1 and 2) from a single sheet of 1/32 in. sheet, perhaps impregnated with PVA to help keep the shape – or just wetted and dried out in the oven, and no dope or banana oil finish to keep weight right down. However, over the years balsa airscrews have been french polished, wax polished, cellulosed, silk covered, and dope and talcum powdered. Perhaps the simplest process turns out the best in the long run!

Well, now the reader has all the information to mould airscrews in the oven, or carve 'em from the solid, as in days of old, when the production of one beautiful airscrew might take a month . . . Remember the 1972 windy Nationals? Now . . . we need more than ever to make airscrews . . . en masse?

Figure 5 – Marking out the blank.

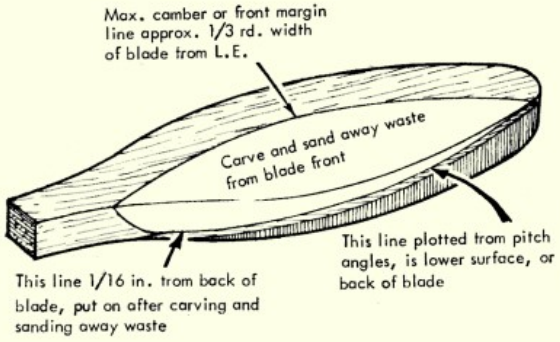
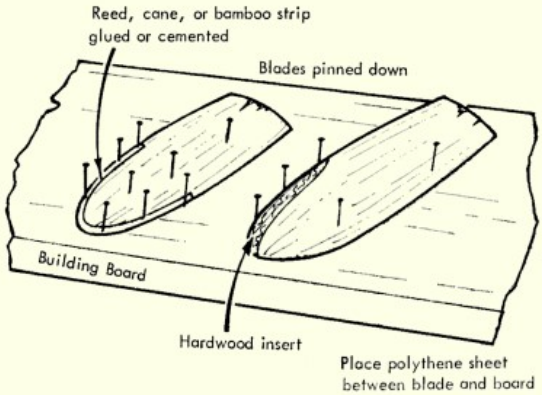


Figure 6 – Tip protection.



They came, they saw, they conquered . . . so now let's learn just how the Dutch do it!

GET THE BEST FROM YOUR FAI RACER

explains British Nationals winner ROB METKEMEYER

IT IS A WELL-KNOWN fact that newcomers to team racing need several years of practice to obtain reasonable results in competitions, and sometimes, even after three or four years of contest flying, success is never really achieved. Last year I took a hard look at this phenomenon to see if there were any clear reasons as to *why* success is sometimes eluded. One important fact which I did discover was that most of the less successful teams (in Holland, Germany, Belgium, etc.) had reasonably good models and motors, often better than my own! However, my brother and I never had to worry too much about most of these competitors as they were always performing far below their true ability, due to varying kinds of 'bad luck'. Often we won against potentially much faster teams just by flying our racer without making stupid mistakes.

Our approach to team racing is basically to achieve consistent, reliable, contest results – the technical development of team racing is not improved by this approach. If everyone started team racing in our way, then in a short time England would have 30 teams flying a consistent 4:45. That would be very dull! Do not expect to find spectacular developments in the technical field from me – I leave that to Paul Bugl and others. I have neither the ability nor tools to be a successful engine modifier, and I believe only a few persons in the world can *really* improve standard diesels (for instance Emil Rumpel's Super Tigres). I mention this because for us it was quite possible when flying only with carefully run-in Super Tigres (G20D and G15 diesel conversions) to succeed pretty well in the International contest field. They were just as fast as most so-called 'tuned' engines! As for models, I think that any proper design, if it is lightweight (500 grammes – 17½ oz. – or under) and well finished, it is capable of achieving good times. Our design, the *Turtle*, will be published and described in the November issue of *Aero Modeller*. . . .

But, like I said before, the object is to gain optimum results in competitions with more or less standard equipment. I have nothing against those people who try to get super performance from technical developments, but think it is more useful spending time on training.

Heat times in contests

Although many people think that a heat time of 5:00 has no importance nowadays, it appears when looking at results of Dutch, German, English and other competitions, that such a time is good enough to get into most semi-finals. Also, in the semis, a time of 5:00 is usually fast enough to qualify for the final. Even at the well attended International (Continental) '72 meetings in Bochum and Utrecht, 4:54 was fast enough to qualify for the semis. Only at World Championships do you really have to go faster than this: in Namur '70 – 4:47, in Pecs '71 – 4:47 and 4:40 in Helsinki '72. But as most of you will not be flying in the World Champs, then a time of between 4:50 and 5:00, flown consistently, will lead to a large number of wins.

How a heat time is achieved

In team racing there are, in general, two time-consuming factors: flying and pit stopping. The *total* flying time is the time the model takes to fly 10 laps, multiplied by 10. For a pit stop, we take an effective loss of 10 seconds (pit stop time = 10 laps timed with a pit stop, minus 10 laps timed without a pit stop).

Ten seconds is pretty fast, but even without an engine cut-off (but with a C.G. wheel) certainly possible after some practice. A light model (500 grammes or less) is required for this as you need the fast acceleration and deceleration. For the initial race start and acceleration we take five seconds, which is realistic for a 2-4 flick start. Table I shows some typical theoretical times.

These calculations are rather surprising, as it appears that a really good time of 4:35 can be flown with a 90 mph racer achieving 34 laps per tank. And a time of 4:50-5:00, that in most cases is fast enough, can be achieved with a racer that has a speed of 86 mph for 25 laps, or 83 mph for 34 laps, provided that the pit stops aren't too slow. Team race flyers will agree that every racing 2.5 c.c. diesel (Super Tigre, ETA, Oliver, Webra Mach II, etc.) in standard form is able to achieve this performance easily, and mostly much better. The reason for not breaking the 5:00 barrier lies not in the lack of technical refinements, but apparently in the inability of the pilot and pitman to let everything function like it should! Only when they do their work well will the theoretical time, as calculated, become a reality.

The team

Firstly, the pitman. He is responsible for making sure that the engine runs as fast as possible and achieves enough laps. Most teams have several engines at their disposal, one of which will be noticeably faster. This one they

Table I – Theoretical times possible

Start	Time/10 laps	Laps per tank	Time	Total
5 secs	24 secs (94 mph)	34	5+240+20	=4:25
5 secs	24 secs (94 mph)	25	5+240+30	=4:35
5 secs	25 secs (90 mph)	34	5+250+20	=4:35
5 secs	25 secs (90 mph)	25	5+250+30	=4:45
5 secs	26 secs (86 mph)	34	5+260+20	=4:45
5 secs	26 secs (86 mph)	25	5+260+30	=4:55
5 secs	27 secs (83 mph)	34	5+270+20	=4:55
5 secs	27 secs (83 mph)	25	5+270+30	=5:05
5 secs	28 secs (80 mph)	34	5+280+20	=5:05

Looks easy, doesn't it? When you can catch a model from a fast landing cleanly, without fumbling or wasting time on each and every occasion, then we will allow you to agree! Until then, watch the experts and practice hard. Here, our author catches his Turtle racer for a pit stop. In the lower picture, note how the refuelling valve is still nearly connected as he checks with his brother/pilot Bert before releasing. If necessary he can give a quick 'squirt' of fuel to prevent the motor from cutting on take-off.

Left: the rule book states that the controlling hand must be kept on the chest except when overtaking, taking off or landing. Here, Bert Metkemeyer takes full advantage of the situation as he pulls hard during take-off. Not only does this maintain live tension on take-off, it also aids acceleration up to 'normal' speed, saving valuable seconds. Above, another Dutch competitor, Buys, checks the amount of time (left) for the warm-up period – an important point.

will use at contests, but is this a sensible choice? That depends. Generally, fast and/or economical engines are critical to set, while slow engines are conversely mostly tractable, less critical.

The principal problem with fast and/or economical motors is this: their operating temperature is higher, and with the greater power they deliver on a lean needle setting, they overheat easily. Another problem is that on the contest-field there is often very little opportunity to find the correct setting by practice-flying, mostly you have to establish this in one or two flights. Frequently, teams make this (wrong) choice and take a chance that they will get a good setting with their fast, critical motor and when it goes wrong they simply call it 'bad luck', but they forget that – in these circumstances – they made the wrong choice! It would be better to choose a reliable non-critical and (probably) slower engine. Five minutes is usually enough in the qualifying rounds, you know!

So, if you have to make a choice between a reliable motor, which turns in 26 sec/10 laps for 25 laps, or a very critical one that can make 24 sec/10 laps with 35 laps, but only achieves this result after practising for half an hour, then *take the first one*.

The purpose of test flying is, in my opinion, to get to know your equipment thoroughly. It is no use flying all day with a certain model to find its maximum through a prolonged setting-period, but you do have to find out what time you can make without any, or after just one, practice-flight. When you've finished a flight put it aside, then try it again in 15 minutes, timing yourself for 100 laps with a normal 90 seconds warming-up period. It is probable that your 'fastest' engine won't give the best results now – it will be beaten by your spare, slower but more reliable one. This will also give you the best contest results, but at the same time it will be more difficult to better 5:00 under these circumstances. If you succeed on one out of three attempts, particularly when there has been a greater time lapse between each attempt, then you are well on the right path! Only by practising with your contest racers in this way, will the day come when you can make a 'cold start' and produce a top time for nine out of 10 attempts with your fastest, critical engine. *Then* you can take it with you to a contest and it will give its full advantages.

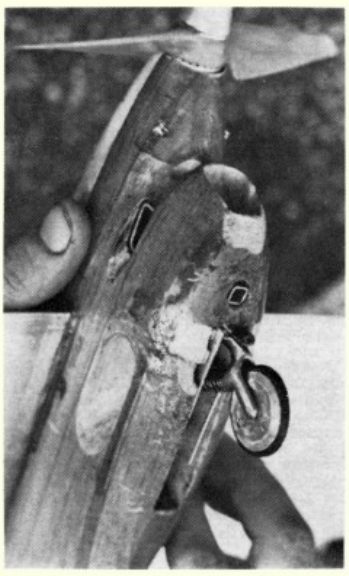
Warming-up engines needs special attention. If a pitman is able to predict the air-run during the warming-up period then he won't need practice flights any more! There are three main points to be borne in mind:

(a) From the time the engine takes to reach its operating temperature from cold, one can conclude whether or not the compression setting is right. In training we measure this time when the compression setting is right. If the compression is right for the contest, then the warming-up time will be equal to that in training.

(b) Nearly every team race motor with a good 'air' setting overheats when it is running on the ground for some time. We have to know exactly the time the engine takes from running on full rpm until it overheats (in the last part of the warming-up period). In the contest's warming-up period you will have to check this time: when it is too long, then the compression will be too low, while if shorter, then either the compression is too high or the needle setting is too lean.

(c) The way in which the engine stops when you close the fuel line gives a good indication as to whether the needle setting is correct. Again, the pitman has to recognise any deviation from the normal pattern. Does the engine cut immediately, or does it gain rpm before stopping or whatever? It does not matter *how* it stops, only you have to know when it is wrong, and when it is right (normal).

Points (a), (b) and (c) all show that the whole warming-up pattern should be regarded carefully, so that any deviation will be recognised immediately. Newcomers to pitting will, in particular, have to practice this warming-up of engines, and that is why it is necessary to take so many 15-minute breaks in training. This way you will have plenty of opportunity to watch the warming-up pattern with good engine settings. It is also very important to keep compression and needle settings in mind. When using the same fuel and propeller, these settings will vary very little, mainly due to changing weather conditions. If the settings change



Team-race flyers frequently develop new ideas to perfect their equipment, some complex, some simple. Here, Werner Siggard of Denmark has come up with a very neat sprung mono wheel undercarriage for his Bugl - powered racer. Strong and light the unit is machined from titanium.

completely from one day to another, do not blame the weather, but investigate everything to find the cause. Often one overlooks these seemingly inexplicable variations, which are, in fact, symptoms of faults either in the engine, tank or model. Table II gives a list of typical symptoms and their possible origins.

Now for the pilot's duties! Up until now I have given details of the pitman's work as far as it concerns care of the engine, and many teams think only he is responsible for the engine. However, the pilot too has a great degree of responsibility for the results of the engine/model combination, and his way if practicing has to be adapted to this. It is very important that he obtains the necessary contest experience and learns an economical style of flying – I mean he must not be slowed down by his opponents. Only flying in many contests will help him to learn this. When practising, the pilot must concentrate very hard – he has to listen to the engine just as well as his pitman, and take action if something is going wrong: for example, 'holding back' the model if the engine is too cold, and whipping if (preferably before) the engine is overheating. If the model has a fuel cut-off the pilot can prevent seizing if his reactions are quick. Preventing a seizure is in my opinion very important especially in my experiences with Super Tigre G.15 diesel conversions, which showed that piston/liners that had seized many times during the running in period, were worthless for team racing. Only the fitting of a new piston and lapping-in would correct this situation.

A pilot who acts in time during practicing will also adapt his flying style to the engine-run in a contest, and can save the flight in this way. Of course the pitman has to recognise this adapted flying style – if the pilot has prevented a seizure at the cost of a warning for whipping, then the pitman will have to change the settings at the next pitstop, or else a disqualification will result.

The pilot also has to examine the contest usefulness of an engine in practising and then he has to learn how to simulate contest circumstances. Practising is pointless when the pilot gives the pitman the impression that everything works fine when he just flys the model standing still, hands on his chest and whipping it a little. Contest circumstances are much more difficult in most cases – often the pilot will walk (sometimes big) circles, especially when the opponents are difficult to fly with. If one of the oponents has an airspeed that is less than 5 km/h. slower than your own, then overtaking without whipping or crossing lines is impossible and your speed decreases to that of your opponent. This can give overheating troubles, unless you tried it out in training. One of the best ways to simulate contest conditions is to fly with your arms stretched out while walking in three foot diameter circles. In this way you can hold back or whip the model as you like (simulating respectively three-man heats and solo flying). Advantages of this style of practice flying, which I first saw done by Herb Stockton, are:

1. The flight circle is increased artificially, so in the race you will achieve the same number, or even more, laps
2. You can easily study the behaviour of the engine than in practicing.

under different loads. An engine that overheats after hold-

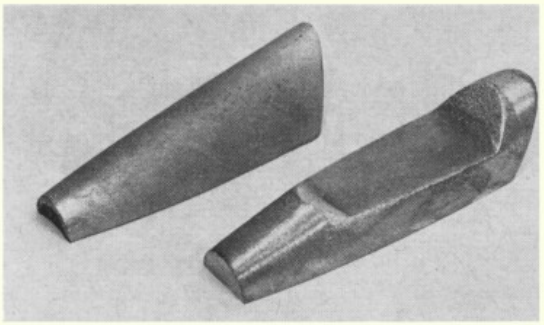
Table II – Differing needle valve settings

Symptom	Possible causes
Needle has to be opened more turns than normal.	1. Dirt in spraybar or fuel tubing. 2. Leaking tank or tube. 3. Leaking crankcase seal. 4. Pinched-off fuel tubing. 5. Engine cut-off is half closed when it should be open. 6. Air vent of tank is blocked. 7. Too large a size of venturi mounted accidently.
Needle needs to be closed more than normal.	1. Dirt in engine air intake. 2. Too small venturi mounted accidentally. 3. The point of the needle has broken, or something else is wrong with the spray bar assembly.
More compression than normal.	1. Too little amyl nitrate in fuel. 2. Bent conrod. 3. Broken gudgeon pin.
Compression less than normal.	1. Too much amyl nitrate in fuel. 2. Carbon on piston and/or contra piston. (turns up gradually).

John Daly runs up his diesel-converted K&B 15 Schneurle port engine prior to a heat. Protective head-gear is both compulsory and sensible – John's stylish 'titfer' being originally designed for ice-hockey players!

Above, Malcolm Ross 'at work'. With his pilot Derek Heaton; they must form just about the fastest pair at pit stops. To see Derek land the model at incredible speeds without bouncing, and in exactly the same place each time, and then to see Malcolm catch it in one easy movement, is to watch perfection in team work.

Tony Harknett is another very fast performer of pit stops. Pilot Steve Smith really 'bangs' the model on to the deck hard, but keeps it there to run along the ground at high speed, straight into Tony's waiting hand.



A rigidly mounted motor is essential for top performance – this is normally achieved by bolting the unit to a metal crutch or pan. At top is a Rossi and below a Rumpel pan, both cast in magnesium. Very rigid, and weighing under 2 oz. in this 'rough' state – available from Irvine Engines.

ing back the model for five laps either has a wrong setting or is useless for team racing. When a motor has become very hot after being held back for ten or more laps it'll have to come in tune within two laps of normal flying (arm stretched out right forwards). If the engine keeps overheating, then it will also do this in the race after being 'bothered' for ten laps. Such an engine is not a good team racing engine. In general a good usable engine (with the right propeller fitted, see Table III, will keep on running well whatever the pilot's style of flying. A well-trained pilot after a few flights should be able to determine whether an engine will keep going or will give problems in a race. This requires a very critical attitude and a great deal of attention by the pilot during practice and contests.

Choosing the correct propeller

When referring to judging an engine, I really mean the combination of engine, model and propeller. Table III gives a few hints on how to determine if the prop is well suited to the model and motor. Let us suppose that the engine has been set optimally when flying normally (no whipping or holding back, arms straight ahead) then we'll see what happens when we whip, or hold back the model with their effects on the speed and the rpm of the engine, and conclude what's wrong with the prop.

Generally you need more 'pull' in a contest so you need more diameter and less pitch. One further point in choosing the prop depends on the opposition. When they're both faster, then you can use a little more pitch (Bartels props vary a bit you know). You do not need very much 'pull' in this case, as you do not have to overtake. If one of the opponents is flying a little slower (a difference of less than two seconds for 10 laps) then you need a 'low gear' prop, with less pitch to have more 'pull' to ease overtaking and prevent overheating. It is therefore useful to watch your opponents in training, to know what you can expect.

Using your equipment efficiently

To achieve good results over the whole season one good model and motor plus an average spare one for emergencies is not good enough. To be sure that you always have enough models and motors to choose from, keep the following points in mind.

(a) Although it is great fun flying with your super-fast equipment, do not do this too often – fast engines are also worn out fast! Do not practice with this more often than you need without losing the feel for it.

(b) Keep on repairing old models. Though not good enough for contests, you can still use them for testing and running-in engines. Do not wear out new models doing this.

(c) Constantly fly and develop new things, or try old things again, from these models and engines, that are still 'spare'; your future contest equipment will have to come.

It is a good idea to use less important contest flights for testing new or spare equipment so by doing this you will soon have two or three equivalent contest combinations at your disposal. If you have a choice, they all have their pros and cons. For instance: quick, but only 25 laps, or slower but 34 laps, etc. When the opponent's ability is not too high it is better not to fly very fast yourself, but to be very reliable, winning this way. If the jury is very 'hard' on overtaking then take a slower two-stopping model so there is less overtaking. With very fast opponents take your fastest, 25 laps range machine and try to keep pace with them or, possibly, block them a little. With a slower model in this case you'll be too easy a target for them while overtaking you.

Table III – Propeller choice

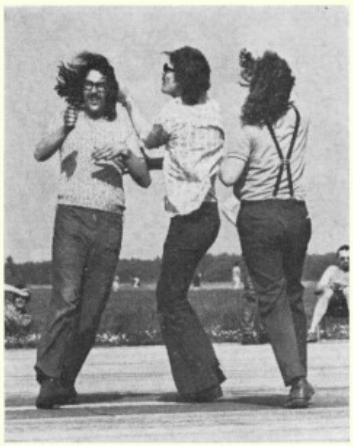
Holding back	Whipping	Comments
Speed decreases badly without much loss in rpm.	Speed increases greatly, little gain in rpm.	Prop is too small in diameter.
Speed decreases badly with great loss in rpm. Engine sounds overheated.	Speed and rpm increase greatly. Engine gets too cold.	Prop has too much pitch.
Little change in speed or rpm.	Little change in speed or rpm.	This seems good, but probably too much diameter and/or too little pitch. By changing this you may gain airspeed.

Conclusion

Summarising, it will by now be quite clear that in our style of team racing the most important thing is handling and being familiar with motors and models. Our stopwatch plays the second fiddle. The 'maximum' speed is not so important and depends a lot on the pilot's flying style. The speed in *contest traffic* is the one that counts.

If you start practising in this way, you will find that your contest results will be equal to, or even better than, training times, though the latter will be slower than before or rather more realistic. Then, if someone asks you what results you are getting, you will never again have to say that they're not so good in contests still, but that practice times are nearly all under four minutes!

At left, Steve Smith (bottom left) crouches during a refuelling stop while Derek Heaton returns to the fray after a similar stop, joining Gunther Schwarz (right) in the Goodyear final at the Nationals.

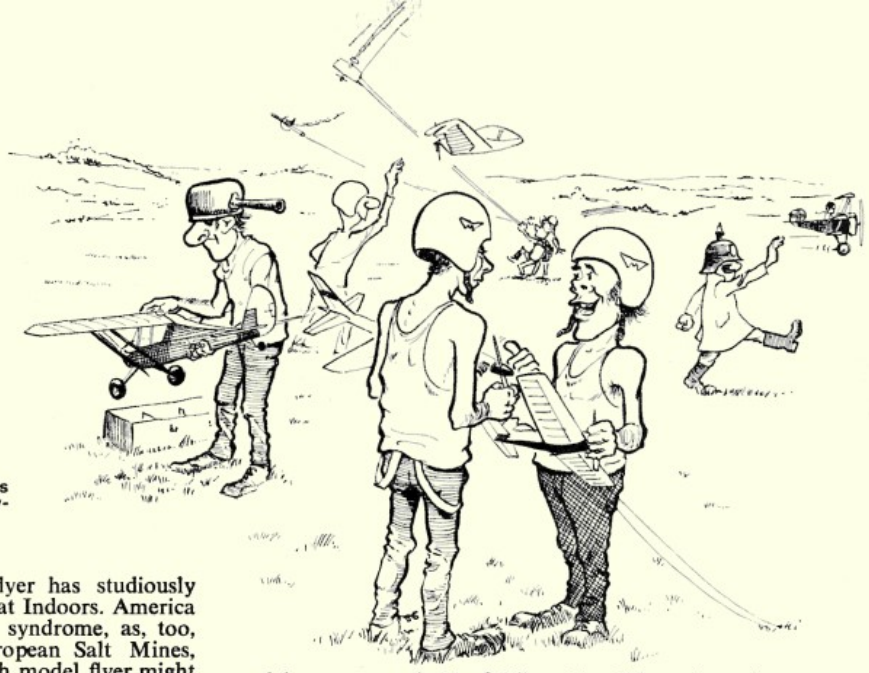


Varying standards of flying here – mostly illegal! At left, Geoff Haycock whips slightly as John Dixon, hand way-off chest, prepares to overtake – rather too soon. . . . Meanwhile, Stevie Smith (right) is flying high, pulling hard and seems about to pass both the others. All highly improper – a strict jury would massacre them!

topical twists

by 'Pylonius'

illustrated by 'Sherry'



'New type of helmet be blowed, it's what his wife thinks of model flying. . . .'

In Fighting

One thing the British model flyer has studiously ignored over the years is the Great Indoors. America may suffer from the sticky bath syndrome, as, too, the microfilm enthusiasts of European Salt Mines, but although the bath of the British model flyer might silt up with ache removing additives, the wonder stain remover is not likely to have to prove itself against the dope streak.

Anyway, a debate on the great indoor apathy has been raging in our letters column between two of our leading free flight exponents. It seems that one of the two gentlemen has been putting prodigious effort into organising the indoor movement in this country, and was mildly criticised by the other gentleman for overlooking the not unimportant fact that nobody was interested (bar one). Whereupon the aforesaid gentleman replied quite heatedly that it was all the fault of the half dozen or so still operative free flighters who seemed to prefer draughty old airfields to draughty old hangars, though it is most likely they have been advised to keep away from draughty old hangars by their Geriatric Physicians.

Coming a Cropper

That saying about the female of the species being more deadly than the male is certainly true of the farming breed in the Lindsholme area. That lady farmer, who went through the free flight ranks like a combine harvester, was not, of course, merely protecting her crops, she was venting the disgust of her sex for the male preoccupation with silly, grass widowing toys and games. For once our male resistance was in shreds, but as a future precaution against over-reacting farmers we should recruit a few Ministry of the Environment officials into our movement so that we could retaliate by threatening them with a motorway or airport.

But coming back to the sex war, nothing enrages the home loving female more than a spouse who isn't there to do his share of the home loving. Which means, of course, he should be beautifying the home so that it can be loved the more. She just cannot understand why the man of her choice would rather go out playing with a toy plane than paper the lounge ceiling. After all, she reasons, if he is going to get a stiff neck he might as well acquire it doing something useful.

Another odd thing, too. Aerodynamically speaking, the separation point of hubby and wife appears to be relative to the money hubby spends on the hobby. I notice that the novice, whether bouncing his rubber model or energetically folding his glider wings, is often accompanied on these missions by his family, whilst contributing little to the Rolls Royces of the Trade. But it seems that when he reaches the heavy hardware stage he tends to leave the little woman at home, although it's possible she has no wish to come along to see the frightful things that are happening to her housekeeping money.

Bore v Soar

If 'Thermal Soaring' were descriptive of a product, I am afraid Mr. Nicholas Neve would still be in dead lumber under the Trade Descriptions Act, in spite of his spirited defence of his particular hobby horse. What Mr. Neve himself admits, and all the experts seem to agree with him, is that the big thermal, upon which soaring is possible, is very elusive of the Radio Glider, and can be disastrous if hooked.

I did not suggest that Thermal Soaring was like Women's Lib, one big bore and no uplift. I merely agreed with what Mr. Neve makes so clear in his letter: that Radio Gliders do a nice lot of floating around on warm air currents (not boringly though, I never said that) but could not be classified as soarers whilst held in a restricted volume of air.

Workshop Blues

I must say I am a bit alarmed at the balsa advertisers according a secondary role to their product in the more 'progressive' areas of model flying. They seem to accept a situation where balsa wood might be all right for bits of rotor blade or for coring glassfibre mouldings, but only the backwoodsman would use it for anything else.

No, what balsa wood did for aeromodelling was to take it out of the workshop and into the domestic environs. Overnight you could become a top modeller with no apparatus more elaborate than a plank on the kitchen table, a few pins and a razor blade. Sadly that happy era seems now to be over; it's back to the workshop again, or worse still, to the model shop with the proceeds of the second mortgage.

Personally, I'm all for the simple life; expensive gear and complication are worrying factors. A model flyer is one who should have his heart in the right place – not in his mouth. Give me a stick of balsa, a razor blade and a squint at the telly between slices and I'm happy.

WORLD CHAMPS

for Free-Flight models at Wiener-Neustadt, Austria

14th-19th August. Reported by Dickie Dickson

Thermister on a pole, light streamer trailing. A Wakefield soaring vertically and a group of Americans clustered at their practice point in vast space of Wiener Neustadt – that is the typical scene of the '73 World Champs.

They're off – and it's not the A/2 fly-off either! Doves of peace released at the official opening scatter for home in a scene often repeated by models as the three contest days passed.

THE SKIES ARE blue at Wiener Neustadt, with only the occasional cloud over the great stretch of the Hungarian plain, extending down from Vienna almost to the border, where battles have traditionally been fought through the centuries . . . the airfield feels rather like that too in its immensity, with its dusty, stony expanse where field-glasses are essential to see what things are happening at any one time.

This is the third time that Austria has staged a free-flight championship here and the third time that Edwin Krill has been the organising genius. 'Unflappable' would be doing him less than justice. As we arrived, he was coping with a full house everywhere and 15 unannounced people who had applied as five only at the last moment. He coped! We should mention that the town was running its own 'mini-Ideal Homes exhibition' at the same time, so that space was in great demand.

The opening ceremony took place at the airfield as usual, with a local band providing music, plus local dignitaries in full force, including the local M.P., at 8 a.m. (Could you picture one of our blokes there at that hour?) The meeting opened to a fanfare and the release of hundreds of pigeons – sorry, doves! – symbolic of the peaceful nature of the meeting, who all flew expertly to o.o.s. maxs to give the meeting the right sort of start.

We had earlier heard some criticism of the omission of a full separate day for practice flying as set out in the original programme, which had been amended to embrace both 'clocking in' and practicing on the Tuesday of arrival. In the event, test flights started at first light . . . one unfortunate wrecked his model before dawn had officially broken! However, August 15th is a Bank Holiday in Austria and it would have been a crime to deny the locals a chance to see the world's best aeromodellers in competition. They turned up in crowds to witness the Power event, and were blessed – those who had patience to wait for the rather extended fly-offs – with a genuine Austrian victory by local club flyer Vaclav Horcicka, who lives in Vienna, but flies with the Wiener Neustadt club.

F.A.I. Power – first to start

The event started a little late on a very tight schedule following the opening ceremony, and this was felt through to the fly-off, with the final result coming only after sunset and with flash almost essential for pictures of the winner. This, too, was the first occasion that the new method was used of fixed take-off locations, which are now restricted to points on an allocated line. Teams retained their timekeepers, who under the latest FAI rules are instructed 'to familiarise themselves with the models' but are moved along the defined take-off line after each round. This means that every hour, goods and chattels must be lifted up and transported to the next post. Some teams followed the obvious method of building up a 'home depot' outside the flight area, bringing in only necessary bits and pieces for each flight. Notable in this respect was Bulgaria with a splendid and roomy tent built from a discarded parachute. Others found the moves disturbing, and may well account for the foolish things that lots of quite experienced people were doing in spite of everything! The other aspect of the new rule whereby the crowd was kept back 25 metres from the flyers could hardly have been read by anyone, though marshals did their best to get some sort of free way.

Once again the greatest technical advances seem to have been in weather-reading skills. Korea, for example, have only the most limited experience of contest power flying, and, so the story goes, even have to make their own

COUPE TATIN (Power)

1.	V. Horcicka	Austria	M+180+180+137
2.	A. Landeau	France	M+180+180+126
3.	S. Agner	Denmark	M+180+180+124
4.	K. Engelhardt	E. Germany	M+180+177
5.	J. Weijters	Netherlands	M+180+170
6.	T. Koster	Denmark	M+180+157
7.	A. Meczner	Hungary	M+180+154
8.	P. Stoilov	Bulgaria	M+180+136
9.	Sin Sang Gel	N. Korea	M+178
10.	V. Dusan	Yugoslavia	M+171
11.	S. Sharin	USSR	M+123
11.	J. Ochman	Poland	M+123

Franco Barthel with typical Italian diagonal - ribbed surfaces, unlucky in last round which spoiled his excellent run of maxes.

13.	T. McLaughlin	USA	180	180	180	180	180	180	179	1259
14.	C. Talour	France	180	180	180	175	180	180	180	1255
15.	E. Reus	Netherlands	180	180	180	180	180	180	173	1253
16.	E. Verbitsky	USSR	167	180	180	180	180	180	180	1247
17.	J. Brodarac	West Germany	180	180	164	180	180	180	180	1244
18.	A. Denkin	Bulgaria	180	180	162	180	180	180	180	1242
19.	G. Barbabella	Italy	180	180	157	180	180	180	180	1237
20.	B. Krycer	Czechoslovakia	180	180	180	176	180	180	160	1236
20.	C. Patek	Czechoslovakia	156	180	180	180	180	180	180	1236
22.	F. Barthel	Italy	180	180	180	180	180	180	152	1232
23.	R. Saukkonen	Finland	180	180	180	180	180	150	180	1230
24.	O. Velunsek	Yugoslavia	180	180	180	148	180	180	180	1228
25.	D. Ducklaus	East Germany	165	180	162	180	180	180	180	1227
26.	M. Bjelajac	Yugoslavia	180	142	180	180	180	180	180	1222
27.	I. Goranov	Bulgaria	141	180	180	180	180	180	180	1221
28.	C. Zimmer	France	180	180	180	180	180	138	180	1218
29.	B. Eggleston	Canada	148	180	180	169	180	180	180	1217
30.	J. Akesson	Sweden	180	180	131	180	180	180	180	1211
31.	**R. Melville**	**Great Britain**	**180**	**180**	**130**	**180**	**180**	**180**	**180**	**1210**
32.	T. Schwend	West Germany	180	180	121	180	180	180	180	1201
33.	H. Spence	USA	180	180	118	180	180	180	180	1198
34.	U. Nygren	Sweden	180	117	180	180	180	180	180	1197
35.	B. Huijben	Netherlands	180	180	180	116	180	180	180	1196
36.	J. Kaiser	Czechoslovakia	180	180	129	161	180	180	180	1190
37.	F. Wolff	USA	114	180	180	180	180	180	173	1187
38.	S. Razman	Romania	180	180	180	103	180	180	180	1183
39.	R. Hagel	Sweden	180	180	180	101	180	180	180	1181
39.	Kim Jung Min	North Korea	180	180	102	180	180	180	179	1181
39.	F. Schlachta	Canada	180	180	101	180	180	180	180	1181
42.	T. Piatek	Poland	180	180	180	110	180	180	169	1179
43.	J. Kumpulainen	Finland	147	180	180	180	118	180	180	1165
44.	W. Mosyrsky	USSR	180	132	180	180	180	180	131	1163
45.	J. Krzeminski	Poland	180	180	180	131	175	180	134	1160
46.	Kim Jong Chol	North Korea	180	180	180	139	180	180	119	1158
47.	S. Lustrati	Italy	115	180	180	142	180	180	180	1157
48.	**R. Monks**	**Great Britain**	**180**	**56**	**180**	**180**	**180**	**180**	**180**	**1136**
49.	H. Liebig	Austria	102	180	180	132	180	180	180	1134
50.	W. Kraus	Austria	180	180	180	47	180	180	180	1127
51.	D. Sugden	Canada	180	180	180	180	180	175	45	1120
52.	U. Schaller	Switzerland	135	127	135	12	180	180	180	1117
53.	A. Valdez	Cuba	72	180	180	178	139	180	167	1096
54.	G. Simon	Hungary	5	180	180	180	180	180	180	1085
55.	**P. Ireland**	**Great Britain**	**180**	**98**	**180**	**138**	**180**	**180**	**125**	**1081**
56.	F. Csizmarik	Hungary	180	170	180	87	180	180	102	1079
57.	H. Benthin	East Germany	140	180	66	180	180	180	139	1065
58.	H. Stetz	West Germany	137	180	180	159	42	180	180	1058
59.	E. Hollander	Sweden	158	87	180	160	180	148	106	1019
60.	S. Sallinen	Finland	180	180	180	16	66	79	122	931
61.	M. Blanco	Cuba	79	180	131	82	156	108	180	916
62.	A. Lever (proxy A. Brabel)	Australia	128	180	57	58	136	180	–	739
63.	P. Holm Nielsen	Denmark	27	180	180	–	129	161	–	677
64.	A. Schoder	Switzerland	155	23	180	–	180	–	–	538
65.	J. Ferron	Cuba	180	99	12	–	61	54	35	441

FRANJO KLUZ Team Trophy

1.	France	3733
2.	Bulgaria	3723
3.	Yugoslavia	3710
4.	Netherlands	3709
5.	USSR	3670
6.	Czechoslovakia	3662
7.	USA	3644
8.	Italy	3626
9.	Poland	3599
9.	North Korea	3599
11.	East Germany	3552
12.	Austria	3521
13.	Canada	3518
14.	West Germany	3503
15.	Sweden	3427
15.	**Great Britain**	**3427**
17.	Hungary	3424
18.	Finland	3326
19.	Denmark	3197
20.	Cuba	2453
21.	Switzerland	1655
22.	Romania	1183
23.	Australia	739

Top Briton in Power, Roger Melville, prepares to release his rear-fin model, dropped time only in 3rd round.

Frank Schlachta, two-tone tissue, Snow geese, and letter trim, left no doubt of nationality. Uses Rossi at an angle.

Ray Monks with the 'model of the NFFS year' smiles, despite second round disaster. Close-up detail of Ray's V.I.T. and Auto Rudder, and his complex timer system in 'Veterano' were given in last month's issue.

N. Korean finalist Sin Sang Gel uses long nose and tail moment arms, missed 9th round by only two seconds. Below, the defending champion Rolf Hagel bides his time but dropped his chance in 4th round.

Popular Champ, Vaclav Horcicka and 'Big Boy' take design trends back apace to those high thrustline, low fin days of 1953! A top class, consistent model, deserving of success.

covering tissue, but, nevertheless, their appreciation of the exact moment to launch brought them level pegging with far more experienced groups. Canada, for example, frankly admitted that conditions were quite foreign to them, and though they put in some good practice hours, were just not able to cope. The team included Brian Eggleston and Dave Sugden, both ex-British modellers (remember the Sugden Special diesel still in the APS plans range?). Every team had its weather man, with his thermal sniffer in many and varied forms, including some of the traditional soap bubble versions, plus metallised mylar tape on poles. Walkie-talkies were in use, with outliers reporting conditions downwind . . . some very nice versions were on view, working usually around 12-13 Mc/s.

First round figures gave promise of great things with 46 maxs out of an entry of 65, comprising 23 nations. A motorcycle recovery squad and a delightful Puch scout car kept worries about lost models to a minimum, with the walkie-talkies transferring observation as necessary.

Second round saw very little change in these high max figures, though, alas, here Phil Ireland produced a surprising 98 seconds, and even more remarkably, veteran Ray Monks, in the excitement of a re-run after exceeding the power run, forgot to set up his timer and D/T'd immediately after the motor stopped, producing a mere 56 seconds. Upsets like this show how important it is for the team to train as a unit, with every man briefed perfectly to his part, like limbs on a body. The Eastern World teams, who evidently have leisure for this kind of training, stood out at all times for this sequence of jobs expertly carried out by everyone. Those Western units who followed this practice benefited in their trouble-free flying system, notably Austria and Denmark. Hagel, defending 1971 champion, flying as of the newly-established right, was still there with a max, as were most of the big name flyers. Surprisingly, U.S.S.R's Verbitsky had failed to make it in the first round (167), as had Eggleston (148) and U.S's Wolff (114).

Weather continued very fine during the midday rounds, with a heat haze over the mountains to the north-west fringed by the mountains of the Hohe Wand nature reserve. What little wind there was took models across the field to the south-west (exactly the same flying position and wind direction as last Champs here, though then conditions were heavy rain). Much of the lift generated was in heat bubbles and could be hard on a model, dying out without reason, or suddenly turning up to rescue a shortish flight, as several, including Koster of Denmark, have good cause to thank. By the halfway stage of the fourth round the number still in with full maxs had shrunk dramatically to 18, so that visions of a mass fly-off had vanished. It was in Round 4 that Hagel slipped to 101 seconds (his only mistake). He eventually finished down the list at 39th – in fact all three defending champions ended lowly placed.

Fifth round lost none of the battling

Second man Alain Landeau, great all-rounder from France, boxy model with forward fin typical of his steady development in F.A.I. Power design.

Top right, Dave Sugden checks the lift while waiting his time to launch. Right, Tom Koster and 'Grootna' flapped-wing model; also used a 'Square Cream' with fixed airfoil. Below, Soviet Union finalist Sharin had cowled engine, strut braced wing panels and glass-fibre prop. Below right, Christian Talour contributed a 14th place, dropping only five seconds to aid French team in winning the Franjo Kluz and Czech Journalists' Trophy. Note long fuselage and high aspect wings with traditional French triple fins.

leaders, then in Round 6 Canada's Dave Sugden dropped five seconds at 175 to come off the full-house group, accompanied by Saukkonen of Finland (150) and Zimmer of France (138). Our remaining G.B. hope, Roger Melville, had clocked only 130 in the third round, but otherwise turned in six beautiful maxs. With mounting excitement, the last round began. Only 15 still in with a chance, it was almost a case of follow-my-leader and strategic ploys of making ready to start . . . even false thermals were announced on walkie-talkies to deceive the others! At this stage the U.S.A. still had McLaughlin there, but, alas, he failed by a single second! Only 179 was recorded, and so became resigned to 13th position at best. Then Holland's Reus dropped seven seconds, and finally Italy's Barthel, whose family has been involved in championships at least as long as Ray Monks, clocked a mere 152. A nice round dozen were left for the fly-off.

This was the very first occasion for a World Champs to use the fly-off method of reducing motor runs by two seconds for each flight. Thus Round 8 (first fly-off) eight seconds, Round 9 six seconds, Round 10 and thereafter four seconds. There was some degree of confusion and spectator invasion (this was after all a Bank Holiday), plus only moderate control by the organisers. Austrians do hate being pushed about and it is probably the most unpoliced friendly state in Europe today, but this did not contribute to getting the crowds rolled back until they went of their own accord! With the time getting on, it seemed likely to last until nightfall, but in the end the 12 had their stations alloted to make their first fly-offs. Lined up were two from Denmark, and one each from Poland, U.S.S.R., Yugoslavia, Korea, Bulgaria, Hungary, Holland, East Germany, France and the hosts, Austria.

The eighth round, eight-second fly-off, lost four: Sing Sang Gel, Dusan, Sharin and Ochman. Six seconds took toll of another five, so that the four-second motor run had Agner (Denmark), Landeau (France) and Horcicka (Austria) still going strong. And what a finish! Landeau and Agner clocked 124 and 126 respectively, and then local clubman Horcicka of Austria made it with 137. Wild local pandemonium with surging well-wishers, night fallen, flash in demand, car headlights on. The worthy Austrians in their enthusiasm forgot to chair the winner, 'control' snatched his model for checking, and great local joy. Austrian T.V. featured it that evening, and everybody was delighted. Edwin Krill, who has worked so hard on these championships at Wiener Neustadt, had the word for it; beaming all over his face he could only say *'Endlich!' 'At last!'*

Winner Vaclav Horcicka will not be unknown to readers as an enthusiastic power flyer, glider flyer and R/C operator. This year he has concentrated on bringing his *Big Boy Mark IV* to its simple perfection, having developed the original virtually from 1960 to the present

Left: Bert Huijben of Holland was another to drop in the 4th round, spoiling an otherwise perfect record. His all-sheet surfaces and tubular fuselage with the almost universal Rossi 15 for power is typical of Western Europe, while at right, Tom McLaughlin of the U.S.A. showed experiment. Tail is swept for extra moment without fuselage weight, and wing swings on pylon for climb/glide trim washout control. Tom lost just one second on last flight to miss the fly-off and placed an unlucky 13th!

day – a better tested formula would be hard to find (we think in this connection of such a model as the *Dixielander*). Powered by a Rossi 15 it is a straightforward tip-dihedral high wing with trapezoidal wing tips. Span is 64 in. with chord of 7¼ in. tapering to 5½ in. at tips. Wing section NACA 4409, with very similar section for tail, prop a 7 x 2½ in. German glassfibre. Timer: the almost universal Seelig. What of the man? Married, two daughters – and works for the well-known company of Hirtenberger on their HP engines. Very fairly says it was truly a combined effort, without the help and advice of clubmates and teammates a win would have been impossible. In the following days he proved a mainstay and help to the Austrian team in both Wakefield and Glider events.

Team aspects – which is really what it is all about – tend to be overshadowed by the individual victor so that we can give some thought about the grand performance of France who took top place here just ahead of Bulgaria. Their top man, Landeau, will be equally well-known, first as a Coupe d'Hiver flyer of renown and to Europeans as a great all-rounder. Alas G.B. came very far down the list at 15th out of 23. Significantly, as team manager David Tipper remarked, the standard was so high that to drop on a single flight to any extent put placement in the bottom 10 per cent.

It was really delightful to find 31 nations on the field, all with their own ideas on details, but producing what to any visitor basically appeared an almost identical model, which meant that individual skill in trimming, launching and judging the moment of launch were the vitals. It seems that the art is now at the stage when a simple broomstick fuselage moulded round a tapered rod, very often in glassfibre though still predominantly of balsa, cannot be improved upon. Add a suitable slight high-wing platform convenient for location of timer; attach a constant chord wing, a forward fin, and a simple tailplane . . . and all the rest is trim, test, fly and fly again. Oh, we had forgotten the universal two-blader folding prop – even Belgium's Mabille disappointed us this year with an almost conventional version of the formula!

Variations on the theme of how to insert a highly-stressed 40 gram length of rubber into the fuselage were legion. At least half the entry had moved from the hand-held model method to the almost standard French-originated retaining fork placed at a convenient level, suitably braced with guy-ropes, tent fashion. Interpretation of design was interesting here. The East Germans favoured a low placing, so that continuing line of rubber from winder to ground made an acute angle. Korea had a higher post with thrust line of rubber wind parallel to ground. U.S.S.R. and U.S.A. still had old-fashioned ideas on man-power, with holder gloved or with some other protection, and in the Russian's case the original large, round, slotted disc to save the fuselage. Motors still break, however, and the inner metal tube removed at a tactical moment was in use. This provides some minor problems, as ever, of getting the last bunches in and prop attached to motor – there were several cases of 'butter fingers' here!

Second round ended with a drastic reduction of clean sheets – Jim Punter made amends with a max and continued to do so during the rest of the event to finish highest placed British team member at 16th. Thirty-four went into Round 3 still full of hope, with only the East Germans still showing unblemished performances throughout the team – an augury of what was to come! Another third fell this time, so that a mere 23

Wakefield

Wakefield day dawned with promise of continuing fine weather – a promise duly fulfilled with some clouds, rather cooler, indeed ideal flying weather. Whether the gentler Wakefields were going to produce an even greater spate of fly-offs was an early question soon dispelled when it became clear that the weather was treacherous in its provision of lift and some nasty upsets came early. From the 86 entries making official flights, 51 achieved a first-flight max, with G.B's Jim Punter (155) already conceding.

Strong Swedish Wakefield team failed to make the fly-off, Hakansson having a bad run – maybe they've used up their vintage Pirelli in past successes?

1.	J. Loffler	E. Germany	M+225
2.	Kim Dong Sik	N. Korea	M+200
3.	M. Kobori	Japan	M+192
4.	K. Wetterberg	Denmark	M+181
5.	R. White	USA	M+154
6.	H. Benedini	Romania	M+149
7.	A. Szynaka	Poland	M+127
8.	J. Dobelmann	W. Germany	M+121
9.	B. Kroon	Netherlands	M+108
10.	A. Oschatz	E. Germany	M+106
11.	D. Voinescu	Romania	M+104
12.	A. McDonald (proxy A. Jack)	New Zealand	M+102

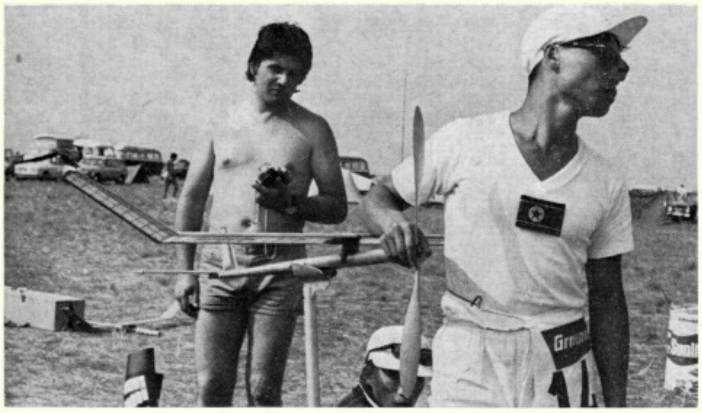
WAKEFIELD TROPHY RESULTS

Alphonse Penaud team trophy

1.	East Germany	3708
2.	Poland	3666
3.	Austria	3619
4.	**Great Britain**	**3604**
5.	North Korea	3583
6.	France	3578
7.	Switzerland	3562
8.	West Germany	3531
9.	Finland	3522
10.	Sweden	3511
11.	USSR	3499
12.	Italy	3498
13.	USA	3483
14.	Bulgaria	3454
15.	Cuba	3444
16.	Argentina	3326
17.	Belgium	3308
18.	Yugoslavia	3293
19.	Denmark	3287
20.	Canada	3274
21.	Czechoslovakia	3199
22.	Netherlands	3190
23.	Turkey	3163
24.	Hungary	3003
25.	Israel	2923
26.	New Zealand	2416
27.	Romania	2176
28.	Spain	1500
29.	Japan	1260
30.	Norway	1189
31.	Australia	1104

13.	W. Siebyla	Poland	180	177	180	180	180	180	180	1257
14.	H. Zachhalmel	Austria	180	180	180	168	180	180	180	1248
15.	D. Siebenmann	Switzerland	180	180	161	180	180	180	180	1241
16.	**J. Punter**	**Great Britain**	**155**	**180**	**180**	**180**	**180**	**180**	**180**	**1235**
17.	M. Carles	France	180	180	180	180	180	180	151	1231
18.	J. Zetterdahl	Sweden	180	180	180	167	161	180	180	1228
19.	**R. Pollard**	**Great Britain**	**180**	**180**	**143**	**180**	**180**	**180**	**180**	**1223**
20.	J. Delcroix	France	180	180	169	180	180	180	151	1220
20.	J. McGillivray	Canada	180	140	180	180	180	180	180	1220
22.	B. Murari	Italy	133	180	180	180	180	180	180	1213
23.	O. Kilpeläinen	Finland	180	159	151	180	180	180	180	1210
24.	T. Stroianov	Bulgaria	124	180	180	180	180	180	180	1204
25.	A. Ruiz	Cuba	180	180	117	180	180	180	180	1197
26.	V. Zapachny	USSR	115	180	180	180	180	180	180	1195
27.	J. Davis	USA	148	180	144	180	180	180	180	1192
27.	E. Melentiev	USSR	134	174	180	164	180	180	180	1192
29.	M. Kiiskinen	Finland	174	180	180	117	180	180	180	1191
30.	E. Reitterer	Austria	172	180	180	180	180	180	118	1190
31.	F. Strzys	East Germany	180	180	180	180	180	108	180	1188
32.	H. Martin	Austria	180	161	120	180	180	180	180	1181
33.	G. Venturoli	Italy	180	180	180	180	108	180	169	1177
34.	J. Klima (World Champion 1971)	Czechoslovakia	180	180	180	180	154	180	118	1172
34.	U. Schaller	Switzerland	169	180	153	130	180	180	180	1172
36.	C. Gonzalez	Cuba	136	180	180	180	180	180	131	1167
37.	Paik Chang Sen	North Korea	180	91	175	180	180	180	180	1166
38.	M. Thomas	Canada	180	180	180	81	180	180	180	1161
39.	R. Johansson	Sweden	180	175	180	102	180	180	162	1159
40.	Kim in Sel	North Korea	77	180	180	180	180	180	180	1157
41.	P. Lagan (proxy R. Bailey)	New Zealand	117	180	180	139	180	180	180	1156
42.	L. Stoianov	Bulgaria	180	73	180	180	180	180	180	1153
43.	A. Graux	Belgium	163	180	180	180	180	87	180	1150
43.	J. Kenan	Yugoslavia	180	154	168	180	180	180	108	1150
45.	W. Eggimann	Switzerland	180	180	180	180	180	142	107	1149
45.	S. Zurad	Poland	116	180	180	133	180	180	180	1149
47.	**I. Kaynes**	**Great Britain**	**180**	**180**	**180**	**153**	**180**	**93**	**180**	**1146**
48.	W. Nimptsch	West Germany	87	180	151	180	180	180	180	1138
49.	V. Kmoch	Yugoslavia	180	180	57	180	180	180	180	1137
50.	J. Nemec	Czechoslovakia	180	180	91	180	180	180	143	1134
51.	G. Rupp	West Germany	180	180	90	143	180	180	180	1133
52.	S. Erbesler	Turkey	162	180	137	180	111	180	180	1130
53.	E. Gouverne	France	110	180	180	137	180	180	160	1127
54.	A. Hakansson	Sweden	180	159	100	180	145	180	180	1124
55.	P. Aalto	Finland	180	180	150	180	133	180	118	1121
56.	E. Karamiyan	USSR	180	180	109	137	180	180	146	1112
57.	J. Vantomme	Belgium	97	114	180	180	180	180	180	1111
58.	G. Marini	Italy	180	115	180	158	180	115	180	1108
59.	G. Minikess	Israel	180	180	84	180	180	123	180	1107
60.	A. Edwards	Australia	180	136	180	180	180	68	180	1104
61.	S. Mirkov	Bulgaria	119	180	111	180	180	180	147	1097
62.	M. Menedez	Cuba	86	180	94	180	180	180	180	1080
63.	N. Yalcinkaya	Turkey	180	180	134	180	180	180	44	1078
64.	A. Simerda	Czechoslovakia	90	180	103	163	180	180	180	1076
65.	R. Maquez	Romania	172	163	70	180	180	180	126	1071
66.	I. Knapp	Hungary	108	138	90	180	180	180	180	1056
67.	A. Mabille	Belgium	180	180	180	153	102	106	146	1047
68.	A. Szeri	Hungary	180	180	180	180	73	112	131	1036
69.	F. Parmenter	USA	180	84	180	123	180	104	180	1031
70.	R. Brand	Israel	180	138	180	180	180	83	89	1030
71.	P. Ruijter	Netherlands	130	99	153	180	102	180	180	1024
72.	K. Kongsberg	Denmark	139	150	73	180	114	180	180	1016
73.	E. Jacobsen	Denmark	134	166	180	118	180	180	53	1011
74.	O. Torgersen	Norway	99	162	180	180	50	180	158	1009
75.	A. Niksa	Yugoslavia	68	81	137	180	180	180	180	1006
76.	M. Blitzmann	Romania	83	159	180	95	180	118	180	995
77.	J. Zolcer	Czechoslovakia	180	68	83	180	180	180	118	989
78.	T. Akca	Turkey	151	117	180	63	180	180	84	955
79.	S. Vincze	Romania	112	119	113	99	180	180	113	916
80.	O. Maczko	Hungary	119	177	71	84	180	150	130	911
81.	B. Oskamp	Netherlands	108	75	180	169	103	91	180	906
82.	M. Segrave	Canada	43	160	138	110	180	124	138	893
83.	R. Aldeguer	Spain	180	96	58	110	180	100	124	848
84.	G. Hertzberg	Israel	180	128	180	114	4	180	–	786
85.	J. Navarro	Spain	110	97	48	141	82	77	97	652
86.	O. Olstad	Norway	180	–	–	–	–	–	–	180

Far left, perpetual performer Hans Martin of Austria, with latest development of his 'Pollux'. Immediate left, bright stripes on summer wear for Polish Andrzej Szynaka, placed 7th in fly-off. Above, Joachim Löffler the new champion, is chaired by team mates after repeating his victory of 10 years earlier on same site. Below left, North Korean Kim Dong Sik, uses a braced pylon-winding mount. Below, from Hungary, Oszkar Naczko with his 'Amphora' had a terrible day – only one max!



out of 86 participants were still in with a chance at the middle round – East Germany still had a full house for the team! Some slight haze and a little clouding in the sky made this a more endurable day, but it was still sunny with variable lift so that the squads of shirt, sheet, scarf, flag-waving enthusiasts who rushed after models flapping like mad to get a bit of a rise, gave the field a kind of crazy balletic quality . . . girl friends, visitors, and even sober local gentlemen in walking breeches and hose joined in the effort!

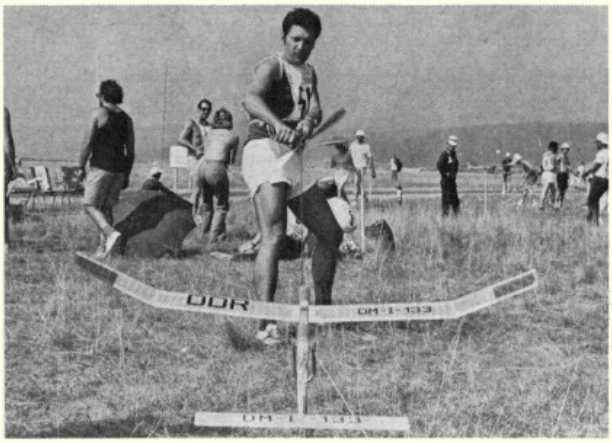
Fifth round left 16, the sixth weeded out another three, to produce a dozen stalwarts for the fly-off. Ron Pollard had spoilt his run with 143 in the third round; Ian Kaynes held on to the fourth when he got 153 and 93 only in the sixth. However, British proxy flier Jack had got his man McDonald's model through to the fly-off, a great achievement for New Zealand.

Once again a dozen faced the final effort. This time organisation was much smoother. There was still plenty of time for extensive fly-off rounds and more of an air of calm. West Germany lost their unbeaten record in round six, but still had two participants, then one each from Korea, Japan, Denmark, U.S.A., Argentine, Poland, Germany, Holland, Rumania and New Zealand. In the event, the single fly-off was enough, with no one reaching the four-minute mark. Loffler of East Germany was a clear winner with 225 seconds ahead of marvellous Kim Dong Sik from Korea, who alone of all those present seemed unimpressed by his effort. Kobori of Japan, their only entry, came third, then down in descending steps as listed above to New Zealand with 102. The spread of nations is remarkable, and a great credit to the Eastern Nations.

There was no mistake at all in the chairing of the handsome young winner by his team-mates, all beautifully turned out in red and white track suit type uniforms and flying nearly identical models in the same beautifully finished red and white colours. Joachim Loffler is a young engineer from Groditz and is the first 'three-timer' at Wiener Neustadt to take a major award at this meeting. Ten years before, he won the Wakefield at the first Wiener Neustadt World Champs. His team-mate Dr. Oschatz, who placed 10th, had won the 2nd W.N. Champs in '69. Naturally the team event also went to East Germany with 3708 seconds, having dropped 72 seconds only through their 21 flights! Writing before the glider event we ask ourselves, is this a record? If so, not for long! G.B. were a creditable fourth – excellent considering we did not have a man in the fly-off.

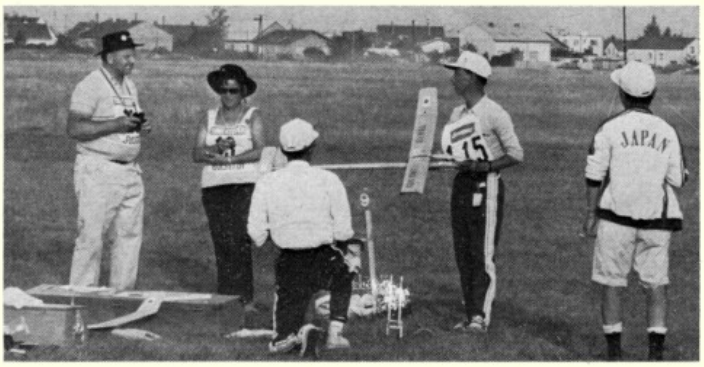
A/2 Glider – the last event

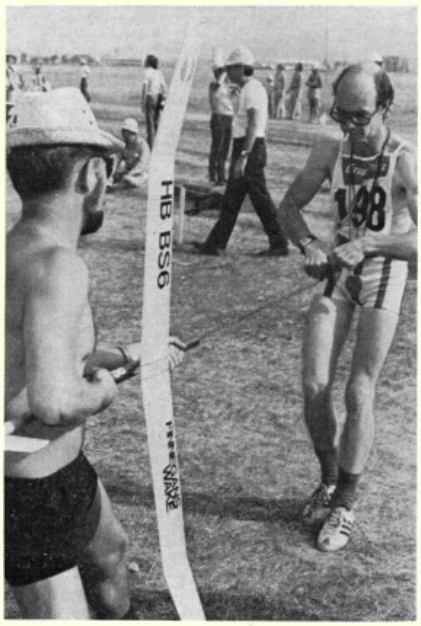
Glider day dawned with even brighter promise of fine, hot weather and, indeed, was the hottest day of all (around 100° F!) with really hot flying to go with it. Who could have visualised a champs with no less than 41 lined up for the fly-off. So great was the flow of maxs that by the end of the sixth round an emergency meeting of team managers was called to tell them that the organisers had duly provided 31 sets of timekeepers (62 persons in all), but the prospect of over 40 to fly made it necessary to ask for volunteers with the necessary skills from non-participating nations' teams to make up the number. This itself was not so easy, as nearly



Piling on the turns above is Dr. Ing. Albrecht Oschatz, always a strong competitor in the Wakefield Class, this time placing 10th in the fly-off and so suporting the Champion, Löffller, in helping his team earn the Penaud Cup. Below, the only competitor from Japan, Mitsuo Kobori, waged a lone battle. Coupled with other incomplete teams so that he did not have a time advantage in the rounds, he came through to a magnificent 3rd place in the final fly-off and even as an individual, he put up a fine 'team' performance.

Above right, flowery lettering decorated the model of U.S.A.'s youngest competitor Jon Davis flying 'Maxine IV'. Jon is staying on in Europe, should be seen at more International events. Right, Urs Schaller of Switzerland, flew his famous 'Finnegan's Wake' but dropped in three of the seven rounds this time. Switzerland placed 7th in the final results.





every team had someone in with a flight. Indeed, by the time the number was made up there had been a little scraping of the barrel, so that perhaps not all the 'extras' knew the ropes as well as the experienced resident experts.

Changes in flying organisation were again apparent for the first time at Wiener Neustadt, with helpers holding models at the fixed stations, again drawn by lot and recirculated each round. Actual flyers drew their checked reels and lines from the timekeepers' barrel and under their eyes affixed them to models and withdrew to their actual take-off spots in the outfield. This had brought the main flying area some 200 yards or more across the airfield, straddling the normal military take-off runway and bringing everyone nearer to their military operating area. For the first time then we saw military police close up. However, they seemed – as a good parachute training unit should – to be as interested in the models as everyone else, and certainly got just as hot or hotter than the rest.

Glider design would appear still to offer the widest scope within the formula for personal preference, with still pleasant aspects of *Lively Lady* influence following Elton Drew's win here in 1969, indeed a New Zealand proxy-flown *Lively Lady* figured in the eventual fly-off. A great deal of development is towards high aspect ratio, with very long wings and narrow effective chord. Tip dihedral was almost universal. Continuing interest in the occasional all-balsa covered wing, though this is no longer the speciality of the Germans or Scandinavians. The comparative 'new boys' appearing on this day in strength, including Turkey, Egypt, Cuba and Korea (though *they* fly like veterans), all inclined towards moderate wing spans with elliptical tips and the classic, good-looking manageable model, easy to transport, though not so easy as others to repair. Should it be added here that repairs throughout were remarkably few? As always, the very prickly thistles of a special Austrian design took heavy toll of soft feet and ankles, and even heavier toll of tissue-covered wings. Patching was the between rounds pastime, in between bouts of thermal spotting duty.

As soon as the first round figures began to be posted on the very effective progress boards, with the late-comers written in rather than printed like 'chalk jockeys' on a racecourse, it was evident that to miss a max was going to be the exception. Pink '180' cards predominated – six only flipped out at this stage of a total entry of 93! As the rounds mounted, brilliant weather continued, maxs proliferated, or so it seemed, and all the spare female population joined in the exercise of sweater-slinging to encourage the uplift gods! Later, indeed, it was announced, under pain of disqualification, that cars might not carry their flapping supporters around under models. It provoked clouds of dust (as if they needed it!) and to some extent defeated its purpose, since timers lost sight of models sooner in the dust clouds!

Third round saw G.B's Tony Cordes down with 139 and McNeill at 32, and he also dropped to 81 in Round 5; John Cooper alone remained to carry British colours to the bitter end. Australia fielded two flyers in person, Allan Edwards and David Anderson, Allan only dropping time on his last flight. Anderson had an unfortunate trip-up while towing for Round 2. It was their proxy flyer, Gottfried Zach, who put them back in the picture with a max and a right to fly-off. Meanwhile, a pale-pink

Above, from Turkey, Semsettin Kardas dropped in just two flights to be knocked down to 83rd – maybe he should change his National number?

Below, gay cavaliers for New Zealand, G. Madelin, Martin Dilly and Bill Hartill had a great time – beat G.B. with 19th place, got two (Madelin for Ian Treen, Martin Dilly for R. Douglas) into the fly-off and were suntanned too!

1973 World Glider Champion, Valerij Ekhtenkov of the Soviet Union. His performance was certainly no fluke. Running at the peak of a very successful competition career, Valerij had shone in the Soviet Nation Internationals at Plodviv, Bulgaria in June and has a skilful trimming technique which brought him a fully deserved championship crown.

Martin Dilly, stripped to his shorts, was continuing his successful management career for New Zealand and, in addition, proxy-flying Mrs. Rosalie Douglas's fine model to a triumphant max, accompanied by Gerry Madelin with Treen's model. It must surely be the first time ever that a girl had figured in a W/C fly-off . . . there should be some real junketing in home town New Zealand when this gets back to them!

With sixth round figures coming in, as mentioned, it became necessary to recruit additional timekeepers to cope with the mammoth turnout expected for the fly-off. In all, 41 entries produced maxs for what was the longest fly-off, most in number, ever before at such a meeting. When the Dutch team manager announced joyfully that he actually had a full team in the fly-off, that seemed pretty wonderful, except that *four* other countries could make the same claim: Austria, U.S.S.R., East Germany and Canada. This must have given great pride and joy to that enthusiastic trio Thompson, Mackenzie and Mello.

Programme times had been well adhered to throughout the day, but the fly-off certainly did not follow ten minutes later. Problems of getting enough timekeepers to bring the total to 82 was difficult . . . some willing spoke none of the 'official' languages, others had no experience. At last they were on the line and models went off in ragged flight with one or two hesitant, just in case a better thermal appeared . . . last up was off the line only a few seconds before the launching period ended.

Light was failing rapidly and models flying into the face of the setting sun in a golden haze, plus dust clouds galore. Everyone with a watch seemed to have different flight times for their favourites, but it seemed fairly clear that none had achieved the four-minute max, so that it was merely a question of getting times in. At first it appeared that Kang Jung Sik of Korea had made it with 162 from a tieing trio at 158. Some timing problems had to be ironed out with light still failing, Spann of Austria turned up 167, then Sodini of Italy with 172. Finally, last times were checked and produced a level 182 for Krejcirik of Czechoslovakia *and* Ekhtenkov of U.S.S.R.! Models were brought back from the distant resting places, and whilst procedure was again discussed, prudent photographers began to take pictures of the remaining pair and their models. Some had indeed concentrated on the young Czech as the 'certainty' until U.S.S.R's champion's time had been verified. Up into the air again for their 9th round; neither wanted more than to circle within the shortening vision of the timekeepers. The Czech made 148, but was pipped by Ekhtenkov's 162 to become champion.

One lighthearted touch! In talking to Vladimir Krejcirik, he mentioned the wing section employed was based on a Turkish model that had appeared in the Czech model magazine *Letecky Modelar* back in 1967 – he just fancied the curve 'as the hand swings' nature of it! That's how airfoils are so often selected!

With five *full* teams in the fly-off, their positions were determined by Round 8, Austria proved winners, followed by U.S.S.R., Holland, D.D.R., and Canada. G.B. placed 23rd of 32.

The day had been immensely hot and few participants had much strength left for anything, but it was a wonderful climax to what will be acclaimed as the most successful championship free-flight meeting yet, with a mixture of countries sharing the spoils, a grand spirit of friendship, the happy Austrian lack of regimentation and the astounding run of super weather.

Prizegiving ceremonies

Instead of a hasty prizegiving on the Friday night when everyone was almost too tired to think, a splendid get-together and luncheon was arranged for Saturday morning at the Sparkasse Hall – a splendidly ornamented hall in white

A/2 GLIDER
Coupe Daumerie and Nordic Cup

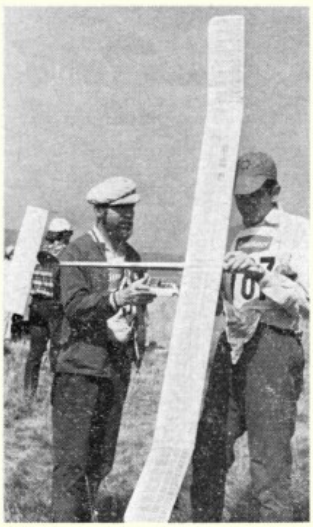
1.	V Ekhtenkov	USSR	M+182 +162
2.	V. Krejcirik	Czechoslovakia	M+182 +148
3.	R. Spann	Austria	M+172
4.	M. Sodini	Italy	M+167
5.	Kang Kung Sik	North Korea	M+162
6.	G. Verbree	Netherlands	M+158
6.	A. Bucher	Switzerland	M+158
6.	B. Leskosek	Yugoslavia	M+158
9.	F. Bjerre	Denmark	M+157
10.	M. Nikolov	Bulgaria	M+156
10.	A. Deubel	West Germany	M+156
12.	P. Kornhofer	Czechoslovakia	M+155
13.	H. Langevin	USA	M+151
13.	A. van Eldik	Netherlands	M+151
15.	H. Chmelik	Austria	M+150
15.	Li Sung Chan	North Korea	M+150
15.	W. Schmelter	West Germany	M+150
15.	E. Voros	Hungary	M+150
19.	A. Lepp	USSR	M+149
20.	K. Kongstad	Denmark	M+148
21.	H. Kumhofer	Austria	M+145
22.	P. Soave	Italy	M+142
23.	H. Broberg	Sweden	M+140
24.	W. Thompson	Canada	M+133
25.	V. Lustig	East Germany	M+130
26.	G. Mackenzie	Canada	M+127
27.	T. Kaminski	Poland	M+126
28.	J. Schreiner	East Germany	M+125
29.	R. Douglas (proxy M. Dilly)	New Zealand	M+124
30.	F. Almagro	Spain	M+120
31.	A. Cincotta (proxy G. Zach)	Australia	M+114
32.	J. van Bragt	Netherlands	M+112
33.	M. Hirschel	East Germany	M+109
33.	V. Issaenko	USSR	M+109
35.	**J. Cooper**	**Gt. Britain**	M+108
36.	J. Pop	Romania	M+104
37.	I. Treen (proxy G. Madelin)	New Zealand	M+102
38.	D. Voshniza	Israel	M+ 99
39.	V. Fernandez	Cuba	M+ 92
40.	A. Rihs	Switzerland	M+ 90
41.	A. Mello	Canada	M+ 78

42.	F. Almagro	Spain	180	180	180	180	180	180	170	1250
42.	C. Boisseau	France	180	180	180	170	180	180	180	1250
44.	G. Hertzberg	Israel	180	180	152	180	180	180	180	1232
45.	Kim Jung Goo	North Korea	180	180	180	180	180	180	151	1231
46.	S. Kubit	Poland	180	180	144	180	180	180	180	1224
47.	K. Kraft	West Germany	180	180	180	180	180	140	180	1220
48.	G. Totev	Bulgaria	180	180	180	138	180	180	180	1218
49.	H. Tadros	Egypt	180	180	180	180	180	180	137	1217
50.	J. Vörös	Hungary	180	180	149	180	180	180	164	1213
51.	I. Horejsi	Czechoslovakia	180	180	127	180	180	180	180	1207
52.	D. Massari	Yugoslavia	180	180	124	180	180	180	180	1204
53.	A. Bardet	Romania	180	180	180	180	180	180	120	1200
53.	W. Haller	Switzerland	180	120	180	180	180	180	180	1200
55.	M. Maupetit	France	180	180	180	180	180	117	180	1197
56.	P. Crowley	USA	180	180	180	115	180	180	180	1195
57.	A. Munoz	Spain	180	180	180	180	180	102	180	1182
58.	J. Guffens	Belgium	180	101	180	180	180	180	180	1181
59.	D. Anderson	Australia	180	99	180	180	180	180	180	1179
60.	P. Aisala	Finland	180	180	180	180	180	180	96	1176
61.	K. Abadjiev	Bulgaria	180	180	180	90	180	180	180	1170
62.	A. Edwards	Australia	180	180	180	180	180	180	89	1169
63.	W. Palmieri	Romania	180	83	180	180	180	180	180	1163
63.	V. Croghan	USA	83	180	180	180	180	180	180	1163
65.	L. Szabo	Hungary	180	180	77	180	180	180	180	1157
66.	**A. Cordes**	**Great Britain**	**180**	**180**	**139**	**180**	**180**	**124**	**169**	**1152**
67.	J. Leleux	France	65	180	180	180	180	180	180	1145
68.	H. Tähkäpää	Finland	60	180	180	180	180	180	180	1140
69.	W. Korczak	Poland	180	180	180	180	180	180	57	1137
70.	J. Livotto	Romania	180	180	180	76	180	180	160	1136
70.	M. El Shazlie	Egypt	180	180	180	132	180	104	180	1136
70.	N. Munnukka	Finland	180	180	180	180	56	180	180	1136
73.	O. Olstad	Norway	180	180	49	180	180	180	180	1129
74.	R. Herzog	Belgium	180	180	134	180	84	180	180	1118
75.	T. Vidensek	Yugoslavia	180	36	180	180	180	180	180	1116
76.	R. Olsson	Sweden	180	180	180	76	138	180	180	1114
77.	P. Otte	Denmark	180	180	114	180	95	180	180	1109
78.	P. Hernandez	Cuba	180	35	180	180	166	180	180	1101
79.	S. Hesthagen	Norway	180	180	180	88	180	180	106	1094
80.	J. van Buggenhout	Belgium	180	180	180	57	180	135	180	1092
81.	P. Dvorak (World Champion 1971)	Czechoslovakia	180	180	65	180	180	180	107	1072
82.	J. Ødemark	Norway	180	180	46	111	180	180	180	1057
83.	S. Kardas	Turkey	180	82	45	180	180	180	180	1027
84.	P. Lagan (proxy W. Hartill)	New Zealand	108	180	180	120	180	72	177	1017
85.	I. Aksu	Turkey	180	147	88	110	180	180	130	1015
86.	**J. McNeil**	**Great Britain**	**180**	**180**	**32**	**180**	**81**	**180**	**180**	**1013**
87.	M. Uehara	Japan	180	47	180	180	65	180	180	1012
88.	I. Wiess	Israel	180	52	59	180	180	180	180	1011
89.	C. Aslan	Turkey	45	180	180	180	180	51	180	996
90.	S. Soliman	Egypt	180	45	180	180	180	180	43	988
91.	B. Eimar	Sweden	180	83	146	180	180	180	–	949
92.	J. Gonzalez	Cuba	180	180	90	62	180	157	28	877
93.	C. Buzzi	Italy	31	180	36	57	180	180	180	844

A world glider championships without David Anderson all the way from Australia, is like boiled egg without salt. But for a tripping up whilst towing in the second round, David could easily have made the fly-off.

1.	Austria	4247
2.	USSR	4220
3.	Netherlands	4201
4.	East Germany	4144
5.	Canada	4118
6.	North Korea	3751
7.	West Germany	3740
8.	Czechoslovakia	3727
9.	Switzerland	3720
10.	Spain	3692
11.	Bulgaria	3648
12.	Hungary	3630
13.	Denmark	3629
14.	Poland	3621
15.	USA	3618
16.	Australia	3608
17.	France	3592
18.	Yugoslavia	3580
19.	New Zealand	3537
20.	Israel	3503
21.	Argentina	3499
22.	Finland	3452
23.	**Great Britain**	**3425**
24.	Belgium	3391
25.	Italy	3364
26.	Egypt	3341
27.	Sweden	3323
28.	Norway	3280
29.	Cuba	3238
30.	Turkey	3038
31.	Romania	1260
32.	Japan	1012

Upper left: Italian Mario Sodini placed 4th. With two in fly-off and their third man last, Italy had a disappointing team result. Left is Czech Vladimir Krejcirik who gave the winner a fine run, and at one time was thought to have collected the trophy. Eventual 2nd place keeps Czechs in forefront of A/2. Above, Fernandez Almagro Jr., 30th in the fly-off. His father (of same names) just missed by 10 secs., was 42nd – very confusing for recorders who thought they were seeing double! Below left, Brer Eimer will never forget Wr. Neustadt – he was the only glider flyer to get a zero for an official flight. Centre, Hugh Langevin, top U.S. glider entry at 13th in fly-off. Right, Heinz Kumhofer, 21st in the fly-off, and whose flight contributed to Austrian team victory out of five nations with perfect seven round score.



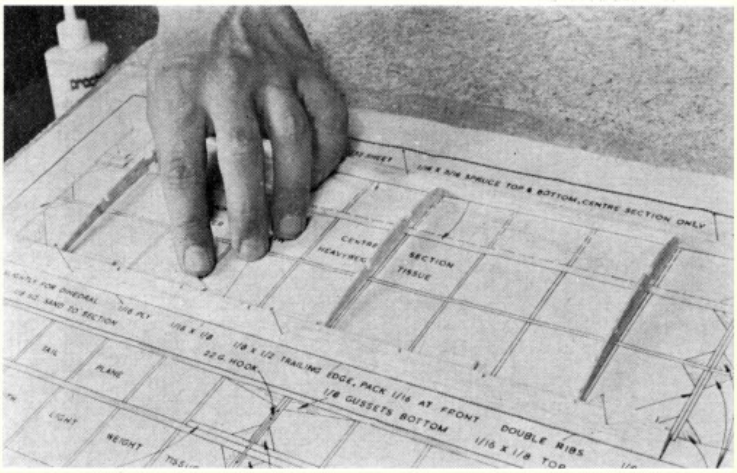
and gold of the Emperor Franz Joseph period, to whom in 19th century days it had been respectfully dedicated. After a meeting of excellent catering throughout in the style of the country, the menu on this occasion excelled itself. Prizes were announced and distributed with local dignitaries in full force, the meal was quickly served, and everyone then indulged in mutual good wishes. Even some of the shyer and less articulate contestants were seen to smile!

Then a quick wash and brush-up for a sight-seeing tour of Vienna, to be capped with a reception at the Town Hall where the Burgomaster of Vienna (equivalent to the Lord Mayor of London) was to receive his guests. Again, a 19th century masterpiece of neo-Gothic, all primed to cater for 500 guests – in the event 540 scrambled in since there were 100 per cent acceptances . . . in fact, a max for the organisers! However, there had been an election and the Burgomaster did not come – instead a recorded version of a welcome was provided by his Deputy. But the food – super luscious again – was there and the drink, and a jolly Austrian band, so everyone had the sort of party everyone likes to go to, thus rounding off most happily a wonderful meeting.

Model flyers who had attended all Wiener Neustadt meetings, 1963, 1969 and 1973 were presented with Austrian Aero Club pennants, and we have even been promised one too, as a three-timer of the model press, so we feel sufficient a veteran to be able to express our very real enjoyment of the special sort of meeting which goes on at Wiener Neustadt. Thanks, therefore, to all who played their parts, from the front men who were seen to be hard at it, through the timekeepers who must have made many new friends, to the backroom department which so faithfully produced detailed, accurate results sheets from about 7.30 a.m. daily. Should free-flight championships be added to the Olympics; is this a move that could be lobbied?

Back to square one

continued from page 545



Use three ribs to establish exact spacing of leading and trailing edges as shown. Note also the scrap piece of 1/16 in. baisa packing being placed under the trailing edge to suit the airfoil section.

angles – the amount is not critical. Figure 1 shows how these bevels are made with a sanding block.

Now, mark the positions of the ribs on the trailing edge (making sure that it is the right way up!), then notch this for the ribs. The notches must be $\frac{1}{16}$ in. wide, $\frac{3}{32}$ in. deep. This may be done with a balsa knife, but the easiest solution is to use a small file – RipMax now sell suitable small files – the one we used gave a very nice $\frac{1}{16}$ in. wide slot. Ideal! The trailing edge material in our kit proved a little 'rough', so we chose to sand it smooth at this stage, rather than when the wing was assembled, as the ribs could easily be damaged. To do this, place the material near the edge of the building board and sand with a sanding block faced with a fine grade of sand paper. Do not press too hard, and sand in long sweeps along the length of the grain. Turn over and sand the opposite side. The wood may now appear 'bowed'. If it is, lay flat and sand on the opposite side to the bow – this will remove the warp.

The front part of the trailing edge must be packed up $\frac{1}{16}$ in. to suit the airfoil section (see Figure 2), so remember this when pinning the trailing edge over the plan. Also, at this stage check the length of the ribs – some of ours proved overlength. Remove the excess, if any, from the trailing edge end. Now is also a good time to check the accuracy of the spar slots in the ribs. Take a piece of spruce spar material (both $\frac{1}{16}$ in. x $\frac{3}{16}$ in. and $\frac{1}{16}$ in. x $\frac{1}{8}$ in.) and check that they fit each and every rib without any force or crushing of the balsa. Actually, all proved fine in our kit, but it is always worth checking – good practice, in fact! Also, if you do have to enlarge the slots to fit the spars, then always take material from the same side of the slot, i.e. either the front or rear, never a mixture of both.

Take three ribs, and lay (do not glue) them in position at the centre and each end of the panel – this is in order to check the position of the leading edge, which may now be pinned in place. Cement two pairs of ribs together (these are for the dihedral breaks), and then we are ready to begin the actual first stage of assembly – to be detailed in the next issue.

Contest Calendar...

September 23rd — **S.E. AREA R/C RALLY.** Fly for fun with Class II Scale, helicopter demo. Prizes, refreshments available. 10 a.m.-6 p.m. at Golden Cross, Nr. Hailsham, Sussex.

September 23rd — **SOUTH MIDLAND AREA RALLY.** F/F: Open R/G/P, Wakefield (Ted Evans Memorial), Tail-less, Chuck, Helicopter, Junior Kit. C/L: Combat, Aerobatics, Goodyear and F.A.I. Team Race. Speed, Junior Stunt. R/C: F.A.I. Aerobatics, Class II scale. Pre-entry R/C aerobatics only: D. Giles, Derron, Station Road, Bow Brickhill, Bletchley, Bucks. Note: Scale Blue and Brown frequencies only. Aerobatics R, O, Y, G only.

September 29th — **NORTHERN GALA.** Open R/G/P, C/L ½A, F.A.I. and B team racing. R/C aerobatics. Venue: R.A.F. Rufforth, Yorks.

September 30th — **SOUTH BRISTOL M.A.C. AUTUMN GALA.** Open R/G/P/ Vintage Precision. Chuck glider. R/C Thermal Soaring. C/L Combat. S.M.A.E. members only at R.N.A.Y. Wroughton.

September 30th — **LIVERPOOL GALA.** Open Rubber, Power Combined Mini, Chuck glider, A/2 (5 rds., progressive fly-off). 10 a.m. start at Chetwynd.

September 30th — **WESTERN AREA C/L RALLY.** Cancelled.

September 30th — **THREE KINGS OPEN CARRIER MEET** at R.A.F. Chessington, Surrey. Details: P. Mason, 143 Mersham Road, Thornton Heath, Surrey.

September 30th — **S.M.A.E. ALL SCALE MEET** at Little Rissington, Glos. R/C, F/F and C/L. **MEET:** Venue: Lowthair Road Playing Fields, Stopsley, Luton. Pre-entry (essential and details from P. Rabiohn. 23 Mardale Avenue, Dunstable, Beds. Tel. 603891).

October 7th — **N. AREA 3rd GOODYEAR MARATHON** at R.A.F. Topcliffe, Yorks. One hour enduro. S.M.A.E. members only.

October 7th — **BURNS BROWN COMBAT AND STUNT**

October 7th — **S.M.A.E. 6th AREA CENTRALISED MEET.** Team Rubber, F.A.I. glider, ½A power. Area venues.

October 14th — **S.M.A.E. C/L TEAM TRIALS** at North Luffenham, Rutland.

October 14th — **YORK M.A.S. F/F RALLY.** Open R/G/P, Combined Mini, HLG at R.A.F. Elvington, near York.

October 21st — **WHARFEDALE 14th RUFFORTH 1000.** Lap C/L event for Class B racers. Details: J. C. Norton, 10 Lawn Avenue, Burley in Wharfedale, Ilkley, Yorks LS29 7ET. S.M.A.E. only. No spectators.

October 21st — **LONDON AREA C/L CHAMPS.** F.A.I., Goodyear T/R, Combat at Charville Lane, Hayes.

October 21st — **S.M.A.E. TWO-DAY F.A.I. MEET** for F.A.I. R/G/P at R.A.F. Strubby, Lincs.

October 28th — **GUISBOROUGH COMBAT RALLY.** Cash prizes and trophies, 40p pre-entry (essential) plus details from S. Smith, 69 Sandmoor Road, New Marske, Redcar, Teesside.

Not all the Whitefield M.A.C. fly free-flight, and just to prove it, here is a picture of the control-line contingent who gave a display at the Prestwich Carnival in June – a regular booking for many years now!

CLUB NEWS

A READER has sent along to us a Guernsey newspaper which carries a front page story about a possible ban on model flying on one of the island's commons. We do not know just how suitable this particular public space is for power flying, but certainly there are places, because of their location and limited size, which are definitely not suitable. These the responsible flyer tends to avoid, and is not, therefore, embarrassed by any restrictions placed on them. But there are other places, particularly large commons, where power flying could reasonably be permitted, subject to certain safeguards. Indeed the model flying could be said to add colour and entertainment value to the local scene. Unfortunately, flying in such areas is not subject to club control, at least not in a complete sense, and the 'rogue' element, noisy and dangerous, soon makes its unpleasant presence felt, whereupon the local authority is moved to act.

There is no ready solution to such a situation, taking in all the factors, but contact between the local clubs and the authority concerned would seem desirable, before ever the situation becomes critical.

Pressure on public open spaces would be eased if the model flyer had more ready access to the many obsolescent or little used airfields throughout the country, but it always seems so difficult to get permission. Mr. D. Robson, P.R.O., of the **North East Area** tells, in his report, of the trouble the Area has had in obtaining the use of R.A.F. Ouston for an R/C event. It was a little late in the day when the field eventually became available, with all the organisational problems that last minute arrangements entail. Mr. Robson goes on to say that the Area has been in a financial dilemma owing to the falling off of membership in the associated clubs, but happily the situation is showing signs of improving, thanks to the strong nucleus who have kept things going. But where is the *Rush Trophy*? Gone to the top commuter of the year, no doubt, but if you do know of its whereabouts please get in touch with the Area Secretary. Also the Area Secretary would like to hear from anyone interested in organising model flying in the North East. His address is not given, but no doubt can be contacted through Mr. Robson. He lives at 1 West Shield Row Villas, Stanley DH9 8AS.

Chobham Common, once the London home of model flying, but now cruelly bisected by a motorway, still provides some sort of facility for the southern modeller, albeit in a much attenuated form. A free flight contest, though, demands a good deal of elbow – or should we say wing tip – room, and it was with some trepidation that the **St. Albans Club** in the absence of other options, set about organising a June Gala on the old wilderness. Happily, the weather was so fair that the limitations of the terrain were not put to the extreme test. In fact, it was a full blooded Gala, with all seven rounds of F.A.I., events completed, and a goodly entry to boot.

Not much hard news to cull from *Marsh Gas*, the bulletin of the South Essex, but as a point of interest I happened to pass their seaside swamp of a flying ground the other week. Looked to be a bit dicey at high tide, though there is no truth in the rumour that they get a little Dutch boy over on Sunday to put his arm in the dyke . . . Unusual lecture given to the club was from a crop spraying pilot. It was given purely out of interest and not with a view to keeping the mosquitos down on the swamp. Like the model flyers to whom he spoke the gentleman concerned led a hairy sort of life, with his plane always a few feet from disaster. It would seem safer for him to sit in the corner of the field and operate a dirty big Radio model. But perhaps a more practical gadget is the new electric r.t.p. pole that the club has acquired. It is said to be fitted with a secret weapon: elevator control.

Trouble at Pendeford Airport for the **Wolves M.A.C.** General flying at the field would appear to be out, and its use for an R/C contest limited to competitors and one judge only, although no reason for the ban is given in the newsletter. Alternative R/C sites are not easy to come by, and members are reminded that only S.M.A.E. members are permitted to use those airfields covered by the Society's special insurance. Quite a sizeable contingent from the club made the annual excursion to the Nationals. Big shock was the 5.30 a.m. flying order for the free fighters and the big success was the social side: home brewed beer consumed in a caravan!

Mr. Johnny Johnson admonishes us for not including previous reports of the **Broadlands C/L Group** in these columns. I cannot understand the oversight but will seek to make amends by quoting from his current report. The season started well for Broadlands when, on an Open Day visit to the Colchester club, the Combat event turned out to be an all Broadlands final, with Mike Doughty getting the verdict over Keith Whiddet. This should have been an augury of good things to come at the Nats., but the breaks (at least not the lucky ones) didn't come the club's way. In desperation for some success Mr. Johnson

flew in the Goodyear 'novices final' (he qualifies an 'L' rating even through twenty years as a modeller). In ½A he had the pleasure of joining a lady pilot for that old two step they do in the circle. No complaints about her long hair interrupting his vision, but he accuses the modern male of adding his long tresses to the stresses of the centre spot. Should hair nets be compulsory, he asks!

More C/L news. This time from the **Ulrmston & D.M.A.C.,** who are committed to this sort of captive flying through geographical circumstances. Unlike the lucky flyer of the '30s who had Faireys at the bottom of his garden, they have the River Mersey at the bottom of their flying field. All the last three monthly competitions have been of the C/L variety, most intriguing of which was the June 'Accurate Flying' event. Not sure how it works but garden canes come into it somewhere. Not so accurate in flight path were the models in the July Rat Race where three came inaccurately to grief. Winners were Fred and Bob Moreton with their Goodyear model in 6:22. On the show-biz front the club make a marathon start to their display season with a two hour demo stint. One small boy, viewing the very much Iron Cross, swastika decorated M.E.109, piped up, 'Hey mister, is that a Spitfire'?

We have a long and colourful report from Mr. Ian Nichols on the display given by the **Worcester Grammar School M.A.C.,** and the Worcester Club at the School's Open Day. For reasons of space we cannot print it all, but it was a well organised affair with circles laid out by the school groundsman. Events included a Goodyear Race and demo flights by some very fine Scale models, notably Leith Brown's trio of *Stuka, Mustang* and *Boulton & Paul Defiant,* and Bob Ivans' *Junkers JU 87* and *Henschel HS129.* In addition to the highly viewable collection of flying models there was also a static display, with a *Bell-Huey Cobra* helicopter as the centrepiece.

Writing in the **Buckkaneers Model Club's** *Scimitar* Bob Rutty writes a sad farewell to his post of Chairman, reluctantly doing so because of business pressures. He is succeeded by another well known modeller, Mike Parrott. In passing Mr. Rutty congratulates Jim Mannall on once again taking the *Gold Trophy* at the Nationals. Main flying news is of the series of displays given by the club. One at Brickhill turned out to be something of a fiasco; the so called flying area being all long grass and giant thistles guaranteed to pierce any thickness of clothing. This, however, was compensated for by the Bletchley Carnival appearance the following week. Derek Giles took over the P.A. system to give an elucidatory commentary on the aerial manoeuvrings. After giving a number of displays the Buckaneers consider the ideal Radio team should consist of six competent flyers, backed up by an equally competent ground crew.

Back again to control line. There is always a hefty content of the subject betwixt the covers of the **Three King's** *Court Circular,* written always with the highest enthusiasm. Good coverage is given to that C/L high spot of the year, the Elliott Gala. Weather was overcast but calm, ideal conditions for the graceful, large Stunt models. Most of the top Stunt men were engaged, and some very striking pieces of hardware were collected by the winners, Jim Mannall (who else?), Pete Tindall and John Lynch. Part of the fun of flying at the Elliott works is the grandstand view it gives of all the colourful craft whisking around Rochester Airport: *Luton Minors, Tiger Moths, Cessnas* etc. Also held in June was the Club Goodyears League Cup. Won by Dave Woods with an ETA 15 *Falcon Special.* Model of the month was Brian Cordwell's *Sopwith 1½ Strutter,* made from A.P.S. plans: a docile but smooth performer.

Ashdown Forest is no one's idea of a model flyer's paradise, containing, as it does, some of the densest and prickliest retrieving country in the Northern hemisphere. Even so the turn outs there for the Area F/F events is generally healthy if not overwhelming. Full results of all these meetings are given in *Seadog,* the newsletter of the **South East Area.** Some high times recorded in the Third Area meeting, thanks to the modeller's dream weather in attendance. A. Child did a 6:01 fly off time in the *White Cup,* and K. Winstanley 6:09 in *Open Glider.* It is interesting to note that first and second men in the *White Cup,* A. Child and J. West, were flying *Ramrods,* a twenty year old design.

The New York young people's club **Flying Dutchmen,** never ceases to astonish me. You would not imagine from the unsophisticated pages of it's magazine *Star Skippers,* that horrible things like engines and radio were ever invented, for therein are all the sort of simple models I built in my extreme youth – and still do. But how sensible for anyone to foster a junior club where the youngsters build the sort of models suited both to their means and capabilities.

Another reminder that the States is not one big Radio jamboree comes from *W. M. C. Patter,* of the **Willamette Club,** Oregon. The two major events advertised are the North West Old Timers and the 'Silents Please' event for Glider and Rubber.

To give some idea of the current models being flown in the States we have this clipping from *El Torbellino*: 'John Pond somehow managed to get through the door with his 9 ft. span Swadich/Zaic 1934 *Miss Model Craftsman* with Brown Junior. (*'Brown Junior, you really must stop bringing these women in . . .* ').

All for the quiet life, too, is the **Vancouver Gas Model Club** for they devote much of *Hot Head* to the inner workings of the indoor glider. And I've always thought that half the fun of chuck gliding was catching the thermal.

Free Flight Down Under is on the up and up if anything, reading through the newsletter of the same name. And high hopes are pinned on the Australian contingent coming over to Austria for the World Champs.

Clubman.

'Joy-Plane'

BALSA CEMENT

New and improved quality. Very quick and hard setting. Penetrates deeply, and is heat resisting and fuel proof. In tubes.

JOY

Made by Modellers for Modellers

JOY is the registered trade mark of **TURNBRIDGES LTD., LONDON, S.W.17**
manufacturers of quality products for **STICKING, STAINING, POLISHING, PAINTING**

MICHAEL'S MODELS

MICHAEL'S MODELS FINCHLEY

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

MODELLING ACCESSORIES

VECO BELL CRANKS	2in. 35p	& 3in.	40p
K & B FIBREGLASS CLOTH ¾oz.	A Pack		£1.65
DEVCON 5 min. EPOXY	Small 49p	Large	£1.04
DEVCON 'ZIP GRIP' 10 suc	Each		74p
X-ACTO RAZOR SAW SET	A Pack		99p
DAVID PLANE WITH RAZOR BLADES			£1.45
HUMBROL MAJOR TOOL KIT			£5.22½
BADGER 250 AIR BRUSH			£4.50
K & B FUEL RESISTANT RUBBER TUBING ...	Per Foot		22p
TAYLOR GLOW PLUGS	Each		44p

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

HENRY J. NICHOLLS AND SON LTD

308 HOLLOWAY ROAD
LONDON N7 6NP
Tel.: 01-607 4272

8 SOUTHGATE ROAD
POTTERS BAR, HERTS
Tel.: Potters Bar 59355

ESTABLISHED 1946

JAP SILK, white, yellow and red, per yard	55p
FIREBALL PLUGS. Hot, standard and cool, per doz. ...	£3.50
Silicone soft rubber tubing for engine timers	44p
PIRELLI rubber. New consignment. 500 gms. (approx.) ...	£2.75
TEMPO glider winch	£4.70
U-REELY handles. 3-line control. Scale-carrier	£6.25
Amyl nitrate (callers only please) 4 oz.	75p
OPTAC rev counter by Skyleader. Recommended	£16.95
HI-START Graupner launching kit. Bungee-line and parachute complete on 12" spool. Very good	£10.98

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

£100,000 INSURANCE

Holder must bear the first £25 of each claim otherwise payable

MODEL & ALLIED PUBLICATIONS LTD.

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

This magnificent insurance scheme which covers modelling activities within Great Britain, Northern Ireland, Channel Islands and the Isle of Man, has been negotiated with a leading insurance company.

In addition a separate Special Insurance is also available for drivers of model locomotives and traction engines.

Normal third party cover costs 75p per year plus regular order for the magazine of your choice; special model locomotive insurance costs £1·25 per year plus a regular magazine order.

All that is necessary for you to do to obtain the benefits of this magnificent cover is to complete the forms sending the second part to us together with your remittance which covers you for one year, and handing the first part to your usual magazine supplier.

We will send you back your membership card, lapel badge and waterslide transfers immediately.

M.A.P. INSURANCE MEMBERSHIP FORM

PART I to be handed to Newsagent

To _____

_____

Please *reserve/deliver one copy of * AEROMODELLER, MODEL BOATS, MODEL ENGINEER, RADIO CONTROL MODELS & ELECTRONICS, WOODWORKER, MILITARY MODELLING, SCALE MODELS, MODEL RAILWAYS **commencing with the** _____ **issue.** (*Delete as applicable)

Name _____

Address _____

PART II of the Form should be completed and sent to us at the address above together with your remittance of 75p, £1·25 for locomotive and traction engines, passenger carrying. PART I should be handed to your usual supplier, either newsagent, model shop, bookseller or wherever you normally expect to get your magazine.

Name (in full) _____

Address _____

_____ Date _____

PART II to be sent to M.A.P. Ltd.
£100,000 insurance scheme. This sum, I understand, includes two transfers and a lapel badge, and is conditional upon my ordering RADIO CONTROL MODELS & ELECTRONICS, MODEL RAILWAYS, MILITARY MODELLING, SCALE MODELS, MODEL ENGINEER, AEROMODELLER, MODEL BOATS, WOODWORKER (*Delete those not applicable)

I have today instructed my newsagent _____

Address _____

to deliver me the magazine _____ until further notice

Registered in England, number 328308 Registered Office 12-18 Paul Street, London EC2A 4JS

MARX

POSITIVE... SAFE STARTING

WITH ALL ENGINES UP TO .61 SIZE . . .

Plugs onto 12-volt accumulator (6v. for small engines) for really powerful spin-over with your fingers well clear of the prop!

MARX STARTER

With 1.5 metre cable complete with plug, TWO cushioned spinner drivers and belt for flywheel starting. Rugged industrial motor rated for three minutes' continuous full load. **£10.95**

DISTRIBUTED BY RIPMAX

MARX

AT YOUR MODEL SHOP

KINDLY MENTION 'AEROMODELLER' WHEN REPLYING TO ADVERTISEMENTS

McCoy .049

£3.04 inc. V.A.T.

This versatile engine is equally at home with control line, free flight or single channel radio control models. Comes complete with 6 x 4 nylon propeller and nylon fuel - tank/engine mount. Front rotary valve assures precise timing, deep double bypass porting gives efficient inlet and exhaust scavenging. High compression glowhead fitted with platinum element. Starting is made effortless by the built-in automatic starter.

Marketed by KEILKRAFT

EURO-MODELS: EXCLUSIVE

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

'AEROPICCOLA' NEW AERO ENGINE STARTER

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

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

Light alloy and steel construction, requires **NO** batteries. **NO** maintenance. Just wind and start every time. Price **£7.93** inc. VAT, price also includes Spinner Pins. **Post paid U.K. only.** Overseas: Rates on application.

Hobby Spot

280 HAGLEY RD WEST
QUINTON
BIRMINGHAM

NEW SHOP

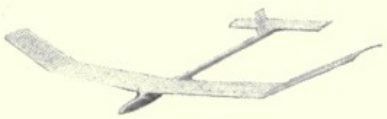
KITS
●
RADIO
●
ENGINES
●
ACCESSORIES

CARS ● BOATS ● AIRCRAFT

ST. LEONARDS MODEL SUPPLIES

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

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



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

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

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

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

Asteroid kits	@ £	=	£
Nova kits	@ £	=	£
Satellite kits	@ £	=	£
I enclose total			£

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

S. H. GRAINGER & CO. CALDMORE MODELS

108 CALDMORE ROAD, WALSALL WS1 3RB, STAFFS.
(1 MILE FROM M6 MOTORWAY JUNCTION 9) TEL. WALSALL 23382

RADIO CONTROL

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

All types servos, actuators, deacs, etc

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

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

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

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

MATERIALS
Solder
Balsa
Humbrol
Fibreglass
Solarfilm
Nylon
Fuel
Paints
Buoyancy Foam

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

NJM

FOR RADIO CONTROL AIRCRAFT KITS & ACCESSORIES

PRICES INC. V.A.T.

SECOND-HAND EQUIPMENT

Cox 020	£2.30
Enya 15 R/C	£6.20
AM 15	£3.20
OS 15 R/C	£6.25
Full 19 incl. sil., as new	£5.50

NEW MACGREGOR
Mini servo MR12P £13.00

Solarfilm
Solid Colours 26" 65p/yd.
Metal-flake Silver, Gold 74p/yd.

RADIO CONTROL BY MACGREGOR

Single Channel from	£13.95
Digimac 1+1, 2 servos	£42.00
Digimac 2, 2 MR10Ps	£52.00
Digimac 3, Tx, Rx, Deacs	£49.00
Digimac 4, Tx, Rx, Deacs	£70.00
MR10P servos each	£11.00
Kwikbilt Spitfire 63", foam cored wings, suitable 40-61 engines	£20.95
SLEC: Hinge (10) 38p Horn (2)	12p
Kavan El. Starter	£13.30
2v. 7AH Accumulator	£2.20

Enya Engines, Silencers, Merco Engines and Silencers, O.S. and E.D. Engines always available.

EASY CREDIT TERMS THROUGH PAYBONDS & BARCLAY CARD
Second-hand equipment bought and part exchanged
STAMPED ADDRESSED ENVELOPE WITH ALL ENQUIRIES PLEASE

NORWOOD JUNCTION MODELS LTD. Hours: 9.30-6; Wed 1 p.m. Fri 9.30-7

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

AVICRAFT LTD

Mattel's Superstar electric-powered Plane £9 post paid
An essential money-saving tool – balsa stripper £1 post paid
Rossi 15 No. 1 & 3 heads 85p post paid, Rossi 15 Speed w/pipe £38.25, Rossi 15N £34, Rossi Plugs 70p post paid
Paxolin sheet 6" x 4" 1/16 and 3/32 28p; 1/8 36p post paid
Rotary Bellcrank 34p post paid. Nylon Wheels 1½" 24p each post paid
Control Line Speed Calculator 56p post paid
Large Stunt Tank 100 c.c. 71p post paid
D-I-Y Mustard Tin Tank 17p post paid
Dayglo Strip, orange and yellow 26p post paid
Warlord £2.80; Minilord £1.75 post paid
Cox engine spares – try us first. T.D. .049 Lead 70p post paid
3 yd. White Tensile Nylon 99p post 6p
3 yd Fluorescent Nylon £1.35 post paid
Silver Swallow £6.50; 2-49 Kesmik 23 £8.95 post 10p
PAW & D.C. NVA's 31p post 4p
Superfast Epoxy 38p Handy Pack; £1.04 Economy
MULTICRAFT de luxe Tool Set £5.47 post paid. No. 2 Kit £1.76 post 10p
D.T. TIMERS. 6-min. £2.30 post 4p. 20 or 30-sec. cut-off £2.40 post 4p
P.A.W.'s as available. 73 Series 1-49 £5.50; 2-49 £6.05; 3-49 £6.60
Laystrate 70 ft. 3-strand 28p; 100 ft. 3-strand 39p 70 ft. 7-strand 39p; 100 ft. 7-strand 46p post 4p
Bobbins, bushes, dethermaliser fuse, etc.

Complete-a-Pac

West High Street, Earlston, Berwickshire, Scotland
Telephone: Earlston 334

We proudly present our very latest C.A.P. 20 Cessna 172 Skyhawk 72" span R/C model for 40-61 power.

Plans on two highly detailed sheets showing full construction. Plans **£2.20** post paid.
Prototype flies very successfully on a Webra 40 preformed three-piece spat set cowling.
Spinner and steerable noseleg available soon.
A pre-cut kit will be available later on in the year.

Please send for our up-to-date price lists covering our other 19 C.A.P. Scale Aircraft, plus a few Bob Holman plans. Send either an 8p Postal Order or an 8" x 4" stamped addressed envelope.

The ALPHA

TRICKLE CHARGER

6 VOLTS
½ AMP

PRICE £2.31 incl. VAT

PRICE LIST FREE

56-PAGE POWER CONTROL MANUAL **20p**

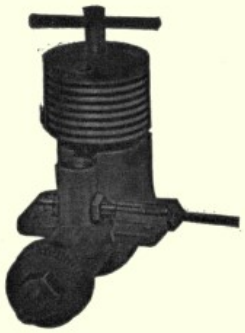
HAMMANT AND MORGAN LTD.
Handem Works, Apem Estate, St. Albans Road, Watford, Herts.

KINDLY MENTION 'AEROMODELLER' WHEN REPLYING TO ADVERTISEMENTS

THE 1973 RANGE OF P.A.W.

HIGH PERFORMANCE
DIESEL ENGINES

BACKED BY
'BY RETURN'
SPARES SERVICE



P.A.W. 1.49DS	...	Squish Head	... £5.50
P.A.W. 2.49DS	...	Squish Head	... £6.05
P.A.W. 19DS	...	Squish Head	... £6.60

All engines are now specially ported to produce a good performance when used with silencers or mufflers. All now also feature Squish Head type combustion chambers.

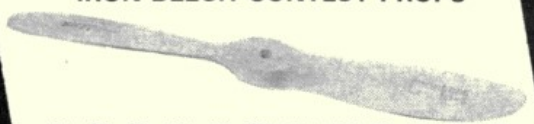
All prices include V.A.T. (10%). Obtainable from Model Shops. In case of difficulty write to:

PROGRESS AERO WORKS

CHESTER ROAD,
MACCLESFIELD, CHES., ENGLAND
SK11 8PU

RIPMAX PROPS

IRON BEECH CONTEST PROPS



9" x 6"	26p	10" x 8"	27p	11" x 7½"	29p	13" x 5"	35p
9" x 7"	26p	11" x 4"	29p	11" x 8"	29p	13" x 6"	35p
9" x 8"	26p	11" x 5"	29p	12" x 4"	32p	14" x 4"	38p
10" x 5"	27p	11" x 6"	29p	12" x 5"	32p	14" x 5"	38p
10" x 6"	27p	11" x 6½"	29p	12" x 6"	32p	15" x 4"	42p
10" x 7"	27p	11" x 7"	29p	13" x 4"	35p	24" x 8"	£2.80

RIPMAX-SEMO NYLON

7" x 4"	17p	7" x 8"	17p	8" x 4"	19p	8" x 6"	19p
8" x 8"	19p	9" x 4"	23p	9" x 6"	23p		

RIPMAX-KAVAN NYLON

8" x 4"	27p	7" x 4"	30p	8" x 4"	34p	8" x 6"	34p
9" x 4"	37p	9" x 6"	37p	10" x 4"	42p	10" x 6"	42p
		11" x 6"	46p	11" x 7¾"	46p		

AT YOUR MODEL SHOP!

PEGASUS MODELS

171 BRAMCOTE LANE
WOLLATON
NOTTINGHAM
NG8 2QJ

Telephone: 281903

Minilord Kit

FOR 1.5 c.c. ENGINES
£1.65
(postage 10p)

Warlord Kit

FOR 2.5 c.c. ENGINES
£2.64 (postage 15p)

Silver Swallow

2.47 c.c. DIESEL ENGINE — complete with silencer **£6.50**
(spares available)

SPECIAL ITEMS FOR C/L MODELLERS

'MUSTARD TIN' TANK KIT	**13p**	(post 3p)
100 c.c. STUNT TANK	**66p**	(post 5p)
1½" NYLON WHEEL	**20p**	(post 3p)
1½" STEEL ROTARY BELLCRANK ...	**30p**	(post 3p)

CONTROL LINE SPEED CALCULATOR

53p (post 3p)

PAXOLIN SHEET

1/16th" x 6" x 4"	**25p**	(post 3p)
3/32nd" x 6" x 4"	**25p**	(post 3p)
1/8th" x 6" x 4"	**33p**	(post 3p)

All advertised items available from stock at time of going to press

All prices include VAT. S.A.E. with all enquiries please

CLASSIFIED ADVERTISEMENTS

All Classified Advertisements must be pre-paid.
PRESS DATE for November issue, 1973, 21st September, 1973.
Private and Trade rate 5p per word (minimum 60p). Box Numbers 25p extra. Display box rate £2.50 per single column inch.
Box replies to be sent care of Advertising Department, P.O. Box 35, Bridge Street, Hemel Hempstead, Herts, England HP1 1EE. Copy received after first post on 21st September will be held over until the next issue, unless cancelled in writing before 15th of the following month. There are no reimbursements for cancellations.

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

VINTAGE FLYING SCALE PLANS

We apologise to customers whose orders were delayed for a week during August. Our famous return of post service is now operating normally again. All items in stock.

1935 Megows 12/15" plans. Waco, Curtiss Falcon, Fokker Triplane, B.A. Eagle, Lockheed Vega, Aeronca, Tipsy, Polish Fighter, Me 29, Douglas Obs., Vought Corsair, Fairchild 45 – 15p each AII12 £1 (U.S. $4.00) Trailblazers from 'Flying Aces' 1937/9 Deperdussin, Gun-Bus, JN4 – 15p each (U.S. 50c). Wright, Bleriot, Curtiss Pusher, Douglas DWC Spad D7, Ryan NYP, 20p (U.S. 50c).

NC4 Flying Boat, Handley Page 0/400 25p (U.S. 75c).

New this month, courtesy Aeromodeller, 11" Gregor FDB-1 (Aug./45 issue) 20p (U.S. $1.00). All post paid

s.a.e. or international reply coupon for illustrated list of over 50 plans

C. TISSIMAN
8 Greystones Grange Crescent, Sheffield S11 7JL

the national
AIR RACERS
in 3-VIEWS 1929-1949
£2.00 postage included

3-Views galore – all of the great classic Thompson, Bendix, Greve and Goodyear air racers are shown in magnificently detailed drawings – AND THERE IS MORE – Voluminous notes give the full story of each racer – pilots – race results – construction and performance data – colour schemes and markings – everything the race enthusiast, modeller, and historian could desire. The Golden Era is re-created on large, crisply-printed 8½ x 11 pages covering over 90 aircraft.

BEAUMONT AVIATION LITERATURE
11 Bath Street, London E.C.1

AUTHENTIC-SCALE
Superb Flying Scale Models designed by Harold J. Towner

Towner's latest! **N.A. Mustang P51.** Showing 'B', 'C' & 'D' variants. Highly detailed. Rugged construction (mainly sheet covered). For C/L but can be modified for R/C. The most flamboyantly-coloured fighter of W.W.II – a real 'eye-catcher' at any Scale Meeting. For O.S.15 or similar engine. 1 in. to 1 ft. scale. 37" W/span. Price 75p plus 5p p.&p.

Handley Page Hampden. Also new this month. A rubber-powered replica of this famous twin-engined bomber. Builds up into a most impressive model. A fascinating exercise for the keen 'builder'. 29" W/span.

Hawker Typhoon 1B. For F/F Power or C/L. Suitable for R/C Conversion. 28¼" W/span

Republic Thunderbolt P47D. For rubber power, but suitable for power conversion. 27¾" W/span

Fairey Barracuda. For F/F Power or S/Channel R/C. Features folding wings as per the original. 26⅝" W/span

Bell Airacobra. Rubber power only. A super model of this beautiful machine. 25" W/span

Bristol Beaufighter. A lovely replica of this famous aircraft which flies really well. 28" W/span

Prices. All plans, except N.A. Mustang, 50p plus 5p postage. P.O. or cheque with order. Two or more plans post free to U.K. or Forces customers. Foreign customers please enclose full return postage (average weight per plan is 2 oz.).

AUTHENTIC-SCALE
26 Sussex Mansions, Old Brompton Road, London S.W.7

FOR SALE

Rare 1/10th scale super detailed printed plans. PZL Wilga, PZL Kos, P51-D, Yak, 9p, Dakota (Li-2P). Most 4 or 5 sheets, each including full colour G.A., cockpit, stencil details, etc. Also C/L plan Yak, 18p. Offers, M. Slota, 2 Oakleigh Avenue, Halifax HX3 0LE. H.

D. C. Sabre 1.5cc, 15cc tank, control line handle, all unused, £4. K. Williams, 64 Francis Road, Stechford, Birmingham 33. H.

E.D. Mk. II (screw down head type), £8.50; Kemp Kestrel 1.8, £8.50; Frog 3.49 Vibramatic, £7.50; D.A. Tellus 2.5 (rare), £8.50; early Oliver Tiger, £5; Enya 19.V, as new, £4.50; Veco 19, £4; McCoy 19, £4. All in good running order, no offers. P. Jackson, 68 Hillview Crescent, Banbury, Oxon. H.

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

WANTED

To copy or purchase, plans Evans Clipper Wakefield. Dr. Carlyle, 21 Monckton Road, Gosport, Hants. H.

CLASSIFIEDS SELL!! OR FIND WHAT YOU NEED

South Devon kits, accessories, engines and all building materials plus ready-to-fly helicopters and control line aircraft.
Agents for RipMax, KeilKraft, Veron, Fox, O.S., Davies Charlton, Solarfilm, R/C outfits and much, much more.

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

TRADE

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

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

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

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

BOOKS

Copies of 'Aircraft of the Fighting Powers' and 'Books of Westland Aircraft' wanted. D. Allman, 2 Brooklands Road, Congleton, Cheshire. H.

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

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

C.F. SCALE DESIGNS

Choose from over 50 Vintage reproduction drawings and instructions.
Flying scale rubber, gas-powered sport and rubber power endurance.
All plans sent post free foreign-sent airmail. S.A.E. for large catalogue.

C. R. FRANKLIN,
12 St. Georges Avenue, Grays, Essex, ENGLAND.

GREAT NEWS FOR SCALE ENTHUSIASTS!

Three super peanut scale kits are now available. These kits by Bob Peck, U.S.A. are the **Druine, Turbulent, Miles M18** and **Pietenpol Air Camper.** Send S.A.E. for details. The **Bill Hannan** catalogue of 50 scale plans and 'things' for the small scale modeller is still available for 20p P/O.

Mr. J. Stennard
Prince Rupert School, Rinteln, BFPO 29.

ELECTRIC R.T.P.

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

HARRY BUTLER (Models)
P.O. Box No. 3
Brockenhurst, Hampshire, England. Telephone Brockenhurst 3034

KINDLY MENTION 'AEROMODELLER' WHEN REPLYING TO ADVERTISEMENTS

ADDLESTONE Tel: Weybridge 45440

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

ALDERSHOT Tel: 26825

CONCORDE MODELS
134 VICTORIA ROAD
R/C Models – All Accessories – Mainstream and Merco Area Agents

AMERSHAM Tel: 4030

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

AUSTRALIA Tel: 347 8029

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

AUSTRALIA Tel: 497087

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

AUSTRALIA Tel: (02) 533 3517

SILVERTONE ELECTRONICS
UNIT 6 No. 2 SCHOFIELD STREET, RIVERWOOD, N.S.W. 2210
Manufacturers of Silvertone R/C equipment, including the Silvertone Mark VII proportional system. Silvertone Keyboard Frequency control. Silvertone Failsafe package. We also stock a complete range of R/C accessories. Mail Order.

AYLESBURY Tel: 85752

TAYLOR
& McKENNA
46 FRIARS SQUARE

BARNSLEY Tel: 6222

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

BARNSTAPLE Tel: 3756

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

BEDFORD Tel: 59652

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

BIRMINGHAM Tel: 021-772 4917

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

BIRMINGHAM Tel: 021-422 7834

HOBBY SPOT
280 HAGLEY ROAD WEST,
QUINTON
FOR THAT LITTLE EXTRA

BIRMINGHAM Tel: 021-444 2369

KINGS HEATH MODELS
(Pearce's Newsagents)
8 YORK ROAD, KINGS HEATH
BIRMINGHAM 14
KeilKraft, Kits, Engines, Balsawood, Paints, Airfix, etc.

BIRMINGHAM Tel: 021-554 5569

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

BIRMINGHAM Tel: 021-327 0872

POWELL'S
MODEL CENTRE
769 ALUM ROCK ROAD, WARD END
BIRMINGHAM 8
Personal attention of G. & F. Powell

BIRMINGHAM Tel: 021-373 5945

JIM DAVIS MODELS
332 MARSH LANE, ERDINGTON
BIRMINGHAM 23
We stock everything a modeller needs to build and fly a Radio Control Aeroplane, and advice

BIRMINGHAM Tel: 021-427 1653

THORNTON'S
Model Specialists
10-12 ALBERT WALK, HARBORNE
BIRIMINGHAM
Veron, Keil, RipMax, Graupner Kits, Radio Control Equipment, Boat Kits, Model Railways, Racing Cars, etc.

BIRMINGHAM

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

BRADFORD Tel: 26186

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

BRIDGWATER Tel: 3632

JACK PALMER
36 ST. JOHN STREET
New to Bridgwater and the West.
We have a large range in stock. Aircraft, boats, radios, engines and all accessories.

BRIGHTON Tel: Brighton 418225

HARRY BROOKS
15A VICTORIA ROAD
PORTSLADE, SUSSEX
The best stocked model shop in the South – You want it, we have it

BRISTOL Tel: 557764

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

BRISTOL Tel: 47505

MODEL HIGHWAYS
85 GLOUCESTER ROAD, BRISTOL 7
Keil, Veron, Topfilte
Fuel by the gal. Balsa, etc.
CLOSED WEDNESDAY

BURTON-ON-TRENT Tel: 0283 64240

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

CAMBERLEY
Tel: 27362

MODEL WORLD (CAMBERLEY) LTD.

Mike Young & Nev Coombs, proprietors
75 HIGH STREET, CAMBERLEY, SURREY

Comprehensive stock of Kits, Engines, Radio Control Equipment, Spares, etc.

CARDIFF
Tel: 29065

BUD MORGAN

22-22A CASTLE ARCADE
CARDIFF CF1 2BW

K.K., Mercury, Veron kits, etc. RipMax, Futaba, McGregor, Simprop, Skyleader, Radio Control equipment. Merco, O.S. and all makes of engines. Paybond, Barclaycard and Access cards accepted.

CARDIFF
Tel: 0222 22245

THE MODEL SHOP
JOHN HALL LTD.
22/24 MORGAN ARCADE

Cardiff's leading Model Shop
Aero and Marine kits, engines, R/C and accessories. RipMax, KeilKraft, Veron, Billings, M.F.A., Futaba, MacGregor, etc., Humbrol, books, profiles, plastic kits, silicone tubing, etc.
Credit terms.

CHICHESTER
Tel: 83592

PLANET MODELS AND HANDICRAFTS

108 THE HORNET, CHICHESTER, SUSSEX

Aircraft and Boat Kits. All Accessories. Balsa Wood, Engines, Fuels, Finishes, etc. Model Railways & Racing Cars.
Personal Service Mail Orders

COLCHESTER
Tel: 45984

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

DEVON
Tel: 2685

THE MODEL SHOP

56 FORE STREET, BRIXHAM

Vast choice of Airfix, Frog and Revell Plastic kits and many at reduced prices. Full range of 'Humbrol' accessories. Headquarters Brixham Modelling Club.

DONCASTER
Tel: 62524

B. CUTTRISS & SONS

MODELS AND HANDICRAFTS
40 DUKE STREET

Call and see our Shop

DUDLEY
Tel: 57045

ACE MODELS

20 FOUNTAIN ARCADE, DUDLEY

For KeilKraft, Veron, Mercury, Revell, Riko, Frog, etc.
CLOSED WEDNESDAY

ESHER
Tel: 01-941 0088

THE MODEL SHOP

111 WALTON ROAD, EAST MOLESEY, SURREY

Model Aircraft, boats, accessories

FAREHAM
Tel: 4136

G. M. H. BUNCE & CO. LTD.

206 WEST STREET, FAREHAM

Aircraft, boats, engines, radio control Engineers/woodworkers tools and machinery

FARNWORTH
Tel: Farnworth 74688

JOYCRAFT

29 HALL LANE, MOSES GATE FARNWORTH, BOLTON

The shop for all your modelling needs. Balsa Wood specialists, materials, engines, aircraft and boat kits, R/C equipment. S.A.E. for reply. Postal service. We are here to serve 'YOU'.

GATESHEAD
Tel: 605545

THE WOOD SHOP
(Models & Hobbies)
2 TOWER COURT, DUNSTON, GATESHEAD, CO. DURHAM

Veron, KeilKraft, RipMax, Graupner, Aurora, Frog, Balsa, Fuels, Dope.
Personal attention by an active modeller.

GLASGOW
041-632 8326

RIDELL BROS.

61 MOUNT ANNAN DRIVE
(Facing Mount Florida School)
GLASGOW S4

VERON, KEIL, BILLINGS, AIRFIX, RIPMAX
Accessories, Balsa, etc.

GRIMSBY
Tel: 0472 2574

EVINGTONS

5 ALEXANDRA ROAD, GRIMSBY

Large stocks of Radio Control equipment, engines, kits, etc. Hire purchase, Paybonds and Access accepted. Your spare equipment sold.
Closed Thursday. Car Park 39 yards.

HARLOW
Tel: 20213

At last, a specialist modelling shop at

ROD'S CYCLES & TOYS

109 THE STOW, HARLOW, ESSEX

KeilKraft, RipMax, Solarbo Balsa, Engines, Fuel, Solarfilm, Billings Boats, Airfix, Tamiya, Pyro, Aurora, etc.
Early closing Wed. Open Sun. morning

HAVERFORDWEST
Tel: 3175

MODELCRAFT

15 CARTLETT, HAVERFORDWEST, PEMBS.

At last a specialist model shop in West Wales. All popular makes always in stock. Mail order? Certainly. S.A.E. for lists please. R/C accessories, Aircraft and Boat Kits, etc.

HEMEL HEMPSTEAD
Tel: 53691

TAYLOR
& McKENNA

203 MARLOWES

HIGH WYCOMBE
Tel: 30741

KEENS MODEL SHOP

28 THE ARCADE (Upstairs)
TOWN CENTRE

The complete modern shop. Aircraft, boats, cars, railways, radio control. All spares, bits and pieces. Plus 26 yards of How To Do It.
Paybonds, Barclaycard, Mail Order

HODDESDON
Tel: 60000

KEITH'S MODEL CENTRE

3 BURFORD ST., HODDESDON, HERTS.

Nr. Clock Tower. Car Park close by.
Model boats, cars, aircraft & AFV kits, wide range of Model Railways, Minitanks, Bellona and accessories.
ALL ASPECTS OF AEROMODELLING, prompt attention to your inquiries.

HONG KONG
Tel: K-680507

RADAR CO. LTD.

2 OBSERVATORY ROAD
TSIMSHATSUI, KOWLOON

The most complete stock in the Far East. Agents for Veron, Solarbo, Keil Kraft, M.K., Pilot, Sole Agents for Graupner, O.S. Prompt mail order service.

HORSHAM
Tel: 61533

MODEL CORNER

30 NORTH STREET, HORSHAM, SUSSEX

Comprehensive range of Kits.
Veron, Keil, etc. P. & P. extra.
Overseas inquiries invited.

HUNTINGDON
Tel: 0480 3328

HUNTS ANGLING & SPORTS (MODELS)

18/19 HIGH STREET, HUNTINGDON
Everything for the Modeller, Kits, Engines, Parts, Materials, R/C equipment. Specialist Engineers. Postal services.
Open 9-6 Mons/Sats. 5 minutes A1.

ILFORD
Tel: 01-554 9142

AVIACOLOUR

MODEL SUPPLY SPECIALISTS

Specialists in Radio Control

466 EASTERN AVENUE, ILFORD, ESSEX
(1 min. from Gants Hill Central Line tube station)

IPSWICH
Tel: 51195

BOWMANS OF IPSWICH

37/39 UPPER ORWELL STREET, IP4 1HL

The RIPMAX Model and Radio Centre
Aircraft – Boats – Cars – Accessories
All leading makes
World Wide Mail Order Service

IPSWICH
Tel: 57106

R. & D. MODELS LTD.

25 NORWICH ROAD, IPSWICH, SUFFOLK IP1 2NG

For radio - kits - engines - aircraft - boats - cars - and specialist items.
THE MODELLERS' MODEL SHOP

KENT
Tel: Ash Green 872136

THE HOBBY HOUSE

10 UPPER STREET NORTH, NEW ASH GREEN, Nr. DARTFORD

Aeropiccola, Steingraeber, K.K., Airfix, Riko, Farish, Peco, etc.
Barclaycard — Easy parking
Closed all day Monday — Mail Order

KINGSTON
Tel: 01-546 4488

MICK CHARLES MODELS

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

LEEDS
Tel: 646117

FLYING MODELS

R. E. SHERWOOD, NEWSAGENT, 88 CROSSGATES ROAD, LEEDS 15

Everything for the Aeromodeller. Come to see our shop and park in comfort.

LEEDS
Tel: 27891

THE MODEL SHOP

38 MERRION STREET
(Nr. Tower Cinema)

Model aircraft—boats—cars—railways, all makes engine. Every accessory, R/C equipment. Same day postal service

LEICESTER
Tel: Leicester 21935

RADIO CONTROL SUPPLIES

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

LINCOLN
Tel: 25907

MODEL CENTRE

24 NEWLAND
THE ENTHUSIAST'S SHOP

Big Stocks of Kits, Engines, Balsa, Accessories, R/C Gear, etc.
MAIL ORDER

LONDON
Tel: 01-542 3062

MODEL AND TOOL SUPPLIES

604 KINGSTON ROAD, RAYNES PARK, S.W.20

Aircraft and Boat Kits, engines and R/C equipment. All leading makes.

LONDON
Tel: 01-520 4565

BRIDGE MODELS

1/2 STATION PARADE, HOE STREET BRIDGE WALTHAMSTOW, LONDON E.17

LARGEST SELECTION OF KITS IN LONDON

LONDON
Tel: 01-228 6319

E. F. RUSS

101 BATTERSEA RISE, LONDON S.W.11

Plastic Kits, Model Boats, Aircraft and accessories. All leading makes in stock.
Friday open until 7 p.m
Early closing Wednesday

LONDON
Tel: 01-560 0473

RADIO CONTROL SUPPLIES

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

LONDON
Tel: 01-788 6497

J. & D's HOBBIES

118A UPPER RICHMOND ROAD
Nr. East Putney Tube Station

Closed Thursday
Open until 7 p.m. Friday

LONDON
Tel: 01-959 2877

H. A. BLUNT & SONS LTD.

MILL HILL CIRCUS, LONDON N.W.7

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

LONDON
Tel: 01-472 2471

A. G. HERMITE
(MODEL SUPPLIES)

633 BARKING ROAD, WEST HAM, E.13

Aircraft—Boat—Car—Plastic Kits & R/C
Saturdays 9 a.m. to 6 p.m.
Postal Service

LONDON
Tel: 01-485 1818

AERO NAUTICAL MODELS

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

LONDON
Tel: 01-852 2637

LEWISHAM MODEL CENTRE

45 LEE HIGH ROAD, LEWISHAM, S.E.13

A good selection of KeilKraft, Veron, Graupner, TopFlite, Gillons, etc., always in stock. All types of Engines, Accessories and Spares; also single and multi R/C equipment. Late night Friday. Mail Order a pleasure. Paybonds and Barclaycards accepted.

LONDON
Tel: 01-852 2637

W. & H. (MODELS) LTD.

14 NEW CAVENDISH STREET, W.1
(Five minutes from Oxford Circus)

LEADING WEST-END STOCKISTS OF ALL QUALITY MODEL AIRCRAFT KITS, BOATS, RAILWAYS, MAIL ORDER

LONDON
Tel: 01-607 4272

HENRY J. NICHOLLS & SON LTD.

308 HOLLOWAY ROAD, N.7

We stock only the best for AEROMODELLERS
Specialists in Radio Control

LONDON
Tel: 01-703 4562

MODEL AIRCRAFT SUPPLIES LTD.

207 CAMBERWELL ROAD, S.E.5

Business Hours:
Monday to Wednesday, 10 a.m. to 6 p.m.
Saturday 10 a.m. to 6 p.m.
Late night Fri. 7.30 p.m. Closed all day Thur.
Postal Service. — Parking Facilities

LONDON
Tel: 01-445 6531

MICHAEL'S MODELS

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

LONDON
Tel: 01-850 4324

ELTHAM MODELS

Ian and Ray Stilling

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

LONDON
Tel: 01-985 7952

WILRO MODELS LTD.

22 CLARENCE ROAD, CLAPTON, E.5

Hackney's Model Shop. Aircraft & Boat Kits, Radio Control & Accessories, KeilKraft, Mercury, Veron, Simplas, Aerokits, Billings boat kits.
Paybonds accepted.

LUTON
Tel: 23182

AEROMODELS (LUTON)

20 GORDON STREET, LUTON, BEDS.

Model Aircraft, Cars, Railways and Boats for the beginner and expert.

MAIDSTONE
Tel: 51719

J. F. CARTER & SONS LTD.
(THE MODEL SHOP)

19-23 UPPER STONE STREET MAIDSTONE, KENT

Complete range of modelling equipment and accessories, including R/C.
MAIL ORDER

KINDLY MENTION 'AEROMODELLER' WHEN REPLYING TO ADVERTISEMENTS

MANSFIELD
Tel: 25808

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

MIDDLESBROUGH

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

MINEHEAD
Tel: Minehead 3423

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

NEWCASTLE
Established 1924

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

NORTHAMPTON
Tel: 31223

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

NOTTINGHAM
Tel: 50273

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

NOTTINGHAM
Tel: 281903

PEGASUS MODELS
171 BRAMCOTE LANE, WOLLATON, NOTTINGHAM
Closed Wednesday

OLDHAM

THE HOBBY LOBBY
10 WATERLOO STREET, OLDHAM
(Off Yorkshire Street)
Aircraft and Boat Kits, Engines, Model Accessories, Radio Control Model Railway. Everything for the Modeller.

OXFORD
Tel: 42407

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

PLYMOUTH
Tel: 21851

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

POOLE
Tel: 3300

SETCHFIELDS
21-25 HIGH STREET
For all Models including Rio and Solido

PORTSMOUTH
Tel: 25049

RAY BROWN MODELS
10 KINGSTON ROAD, PORTSMOUTH
Experience tells — years of pro-modelling and contest flying in all categories at your service. Come see the best and get full personal attention from Ray Brown.

POTTERS BAR HERTS.
Tel: 59355

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

READING
Tel: 0734 477122

CHILTERN SPORTS SUPPLIERS
16 CHURCH STREET, CAVERSHAM, READING
The North Reading sports and hobbies centre. Always personal service and friendly advice.

READING
Tel: Reading 51558

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

READING
Tel: 50074

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

ROMFORD
Tel: ROM 44508

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

SHEFFIELD
Tel: 581197

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

SOLIHULL
Tel: 021-744 3374

SHIRLEY MODEL SUPPLIES
62 STRATFORD ROAD, SHIRLEY
Triang, Scalextric, Airfix, Balsa Kits, etc. Personal attention and advice to young modellers.

SOUTHAMPTON
Tel: 0703-25565

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

SOUTHAMPTON
Tel: 25919

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

STAFFORD
Tel: 3420

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

STAMFORD
Tel. 4524

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

STOCKPORT
Tel: STO 5478

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

EVERYTHING FOR THE MODELLER

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

RADIO CONTROL: SINGLE CHANNEL OR PROPORTIONAL
By **MacGREGOR. LIST S.A.E.**
KEILKRAFT, MERCURY, MOTORS. LISTS S.A.E.

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

JONES BROS. OF CHISWICK

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

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

---

look! low prices

DIESEL and GLOPLUG AERO ENGINES

DC Wasp 0.8cc	...	£2.38
DC Merlin 0.76cc	...	£3.18
DC Spitfire 1cc	...	£3.78
DC Sabre 1.5c	...	£4.00
OS20 R/C	...	£9.43
Frog 2.49	...	£5.81
Frog 3.49	...	£5.89
P.A.W. 1.49 DS	...	£5.00
P.A.W. 2.49 DS	...	£5.51
P.A.W. 19 DS	...	£6.00
Veco 61	...	£25.41
ED Fury R/C	...	£5.76
Fox 25 R/C	...	£6.85
Fox 40 R/C	...	£9.00
Webra 61 R/C	10cc	£36.30

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

THE MODEL SHOP (Guernsey)

No. 1, Commercial Arcade, Guernsey, C.I.

Make it Legal...

get your R/C licence

Just in case some newcomers to the hobby are not aware, operation of radio control equipment requires a licence. This costs £1.50, but it covers a five-year period, so at 30p per year, the licensing fee can't be described as expensive.

Licence application forms are available from:

The Ministry of Posts and Telecommunication,
Waterloo Bridge House,
Waterloo Road,
London S.E.1.

SUTTON
Tel: 01-330 2964

RADIO CONTROL HOBBIES
243 CHEAM COMMON ROAD
Worcester Park, Nr. Sutton, Surrey

We are well worth a visit. Agents for KeilKraft, Veron, etc. With accessories to back up.

WALSALL
Tel. 23984

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

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

WOLVERHAMPTON
Tel: 26709

MODELS & HOBBIES
BELL STREET, MANDERS CENTRE, WOLVERHAMPTON

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

SWANSEA
Tel: 52877

SWANSEA MODELS & HOBBIES
11 SHOPPERS WALK, OXFORD STREET, SWANSEA

Beginners and experts welcome. We have huge stocks of kits, materials and accessories, engines, electric motors and radio control. Plus all the help that we can give.

WALSALL
Tel: 23382

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

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

WORCESTER
Tel: 0905-26697

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

Specialist in
BOATS - CARS - AIRCRAFT
RADIO CONTROL EQUIPMENT

SWINDON
Tel: 26878

J. & M. MODELS
2 CIVIC CENTRE, SWINDON

Comprehensive range of goods to suit all Aeromodellers

WATFORD
Tel: Watford 43026

MODEL EXCHANGE
71 ST. ALBANS ROAD, WATFORD, HERTFORDSHIRE

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

WORKSOP
Tel: 2856

MODEL CENTRE
RYTON STREET

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

TUNBRIDGE WELLS
Tel: 31803

TELESERVICE
108 CAMDEN ROAD

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

WELWYN

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

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

YEOVIL
Tel: 21083

THE DIGI HANGAR
79 PRINCES STREET, YEOVIL, SOMERSET

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

WALKDEN
Tel: 061-790 6707
061-890 3030

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

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

WIGAN
Tel: 83208

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

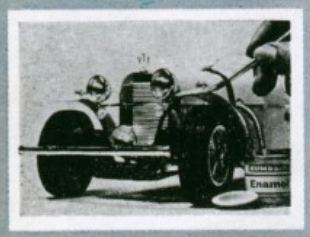
Radio Control equipment, Aircraft, Rail and Boat Kits and all your modelling requirements. Personal attention assured.
IT WILL PAY YOU TO VISIT US
Easy parking
MAIL ORDER SPECIALISTS

MODEL SHOPS EVERYWHERE

Get on to your Aeromodeller map with your name and address in the Directory. Enquiries to:

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

KINDLY MENTION 'AEROMODELLER' WHEN REPLYING TO ADVERTISEMENTS



Skill, patience and Humbrol modelling products

Humbrol – the name known and trusted by modellers the world over for quality, reliability and value for money. Dopes, thinners, Britfix adhesives, Multicraft knives, brushes – and, of course, Humbrol's unbeatable range of non-toxic enamel and "Authentics"

Ask for Humbrol – the name you can rely on.

Humbrol modelling products are available from leading Model and Toy shops. Humbrol will be pleased to send you – FREE – colour cards and leaflets giving you full details of the Humbrol enamel and "Authentics" range.

Write to Mr. H. Stewart, Dept. 12, Modelling Division, Humbrol Limited, Marfleet, Hull.

HUMBROL

KEILKRAFT

A selection from the KEILKRAFT range

RUBBER POWERED KITS

COMPETITOR 89p

AJAX
A true classic whose reputation is shared only with its sister ship, the 24" span 'ACHILLES' Wingspan 30".

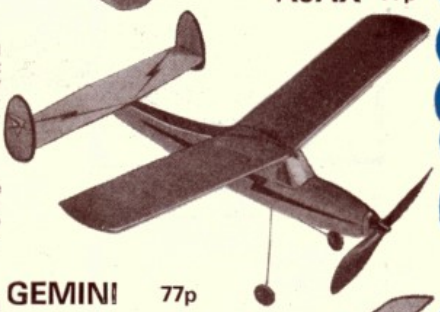
COMPETITOR
The pleasing lines of this model have made it one of the most popular kits in the whole KEILKRAFT range. Wingspan 32".

AJAX 77p

ROBIN 89p

ROBIN
All parts die-cut, preformed undercarriage and sheet sides make this model easy to build and an ideal beginner's choice. 23" Wingspan.

GEMINI
All parts except for wings are pre-cut, pre-decorated sheet balsa. A fine introduction to aeromodelling. 21½" Wingspan.



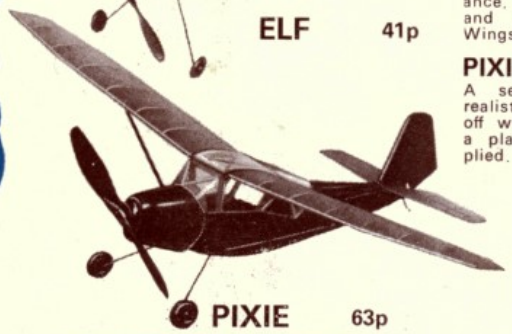
GEMINI 77p

ELF 41p

ELF
Smallest and lowest-priced rubber model in the KEILKRAFT range, but very good value for money. Wingspan 16".

GIPSY
A large duration model capable of very high performance. Construction is basic and very straightforward. Wingspan 40".

GIPSY £1.34

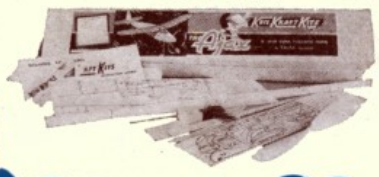


PIXIE 63p

PIXIE
A semi-scale model with realistic good looks. Knock-off wings are featured, and a plastic propeller is supplied. Wingspan 22½".

See also the FLYING SCALE SERIES

A complete range of W.W.I., W.W.II., Military and Civil aircraft types about 20" span. All illustrated in the current KEILKRAFT HANDBOOK.



A TYPICAL KIT CONTENT WITH BELCO-BALSA

41p

FAIRY GANNET