December 1973

Aero Modeller

MODEL ENGINEER EXHIBITION 1974

20p USA & Canada $1

INCORPORATING MODEL AIRCRAFT

MAP HOBBY MAGAZINE

TWO FULL SIZE PLANS INSIDE!

VERON

THE MOST POPULAR KITS IN THE WORLD

KITS THAT FULFIL THE FASCINAT

BACKED BY A COMPREHENSIVE RANGE OF

FOKKER D.VIII

46" (1168mm) VERY-NEAR-TO-SCALE (CLASS 2) VINTAGE W.W.I SINGLE SEAT FIGHTER

KIT PRICE
£9.16

IN 1972/73 THIS KIT OUTPACED ALL OTHERS IN THE VERON RANGE

FOKKER must have designed this eternally remembered design with the modeliist in mind. Ideal for single channel – one Propo Servo on rudder with 1.5 c.c. (.09) motors and up to 2 channel (Rudder/Elevator) with 2.5 c.c. (.15 cu. in.) motors.

Kit complete with A.B.S. Cowl, Vintage Wheels, Full Decals

Also suitable for Free-Flight with 1 c.c.

SPRINGBOK

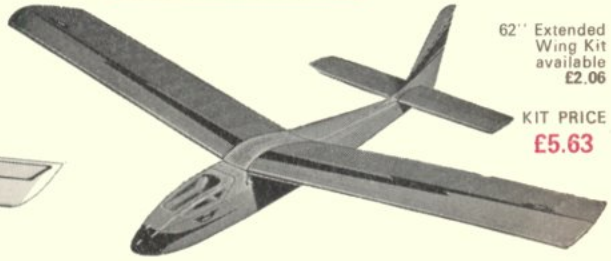
Penetration Soarer 72" (1830mm)

For 2-Chan. on Rudder & Elevator only

KIT PRICE
£8.67

IMPALA

The ORIGINAL Hillside Soaring Trainer & still the best! 1 or 2 channel

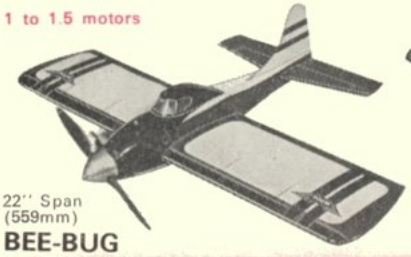


62" Extended Wing Kit available
£2.06

KIT PRICE
£5.63

A QUARTET OF CONTROL-LINERS

1 to 1.5 motors



22" Span (559mm)
BEE-BUG

For 1.5 c.c.

25" Span (635mm)
BOMB-BAT

For 3.5 to 5 c.c.

F.W. 190 A3
33" Span (838mm)

BEDFORDSHIRE
LUTON
Luton Model & Timber Supplies,
1A Waldeck Road.
Manle Models,
16 Maple Road.
SILSOE
Silsoe R/C Models,
10 High Street.
BERKSHIRE
READING
Chiltern Sports Supplies,
16 Church Street,
Caversham.
G. SLEEP LIMITED
22-24 Kings Road.
WALLINGFORD
Wallingford Model Centre,
31 High Street.
CAMBRIDGESHIRE
CAMBRIDGE
Remnodels,
68 Fitzroy Street.
CHESHIRE
CHESTER
The Model Shop,
57 The Forum,
Northgate Street.
ELLESMERE PORT
Leigh's Model Shop,
Westminster Shopping Precinct.
KNUTSFORD
Cheshire Model Supplies,
48 Summerfield Road,
Mobberley.
MACCLESFIELD
Wilson S. Water Models,
Park Mill,
Hobson Street.
STOCKPORT
The Mint Man,
350 Adswood Road.
The Model Shop,
380 Wellington Road South.

CORNWALL
TRURO
County Models,
95 Pydar Street.
HELSTON
Eddy & Son (Helston) Ltd.,
21 Meneage Street.
PENZANCE
The Model Shop,
Causeway Head.
CUMBERLAND
CARLISLE
Autoaids,
19 Globe Lane.
CARLISLE
Watsons Radio,
31 Boundary Road.
PENRITH
S. J. Harper,
48 Castlegate.
DERBYSHIRE
CHESTERFIELD
Repperdays,
19 Packers Row.
HEANOR
Wreuland's Model Shop,
39 Derby Road.
SPONDON
Super Models,
33 Chapel Side,
Chapel Street.
DEVON
PAIGNTON
Marsells,
61 Palace Avenue.
DORSET
WEYMOUTH
Redlands Hardware,
73 Greenway Road,
Redlands.
WIMBORNE
The Hobby Horse,
13 Leigh Road.
DURHAM
SOUTH SHIELDS
Laygate Model Shop,
12 New Green Street.

SUNDERLAND
The Model Shop (Chippy's),
W. & K. Evans,
23 Bedford Street.
GATESHEAD
The Wood Shop,
2 Tower Court,
Dunston.
ESSEX
EPPING
The Model Shop,
95 High Street.
HALSTEAD
D. & R. Cuthbertson,
51-55 Head Street.
HARLOW
Model Mart International,
74 Little Parsys,
Rod's Cycles & Toys,
109 The Stow.
LEIGH-ON-SEA
Wings & Wheels,
1372-76 London Road.
SOUTHEND-ON-SEA
Hobby Store,
359 Chartwell Square.
GLOUCESTERSHIRE
BRISTOL
Jim Bennett Models,
351 Church Road,
St. George.
Model Highways,
85 Gloucester Road.
YATE
Yate Hobbies Centre,
44 Station Road.
STROUD
Max Elderkin Models,
25-26 Nelson Street.
HANTS.
ALDERSHOT
Concorde Models,
Hobbies Specialists,
134 Victoria Road.
ALTON
Guy Radford (Alton) Ltd.,
20-30 Normandy Street.

BOURNEMOUTH
R. F. Austin,
156 Seabourne Road,
Southbourne.
Grant's Models (Ltd.),
308 Charminster Road.
EASTLEIGH
Vernons,
45A Leigh Road.
FAREHAM
C. M. H. Bunce & Co. Ltd.,
206 West Street.
FLEET
Modelcraft (Fleet),
10 Reading Road South.
PORTSMOUTH
Ray Brown Models,
10 Kingston Road.
Robin Thwaites,
The Hobby Shop,
28 Arundel Street.
HEREFORDSHIRE
HEREFORD
Fred Perkins,
48c Commercial Road.
HERTFORDSHIRE
HODDESDON
Keiths Model Centre,
1 Burford Street.
ST. ALBANS
Gordon Price,
42 Camp View Road.
WATFORD
Model Exchange,
71-75 St. Alban's Road.
WELWYN GARDEN CITY
H. A. Blunt & Sons Ltd.,
38 Fretherne Road.

IRELAND
BELFAST
The Model Shop (Belfast) Ltd.,
10-16 Queen Street.
EIRE
BRAY
W. J. Owens,
41 Main Street.

DUBLIN
Terry's Toy Shop,
4 South Great George's Street.
KENT
ASHFORD
Ashford Models (Kent),
44 Hunter Road,
Willesborough.
BEXLEY
Bexley Model Centre,
28 Bourne Road.
CANTERBURY
Needlecraft & Hobbies,
Northgate.
EDENBRIDGE
Joyloys,
80 High Street.
GRAVESEND
Sports & Hobbies,
182 Parrock Street.
RAMSGATE
Kingcraft Models,
136 High Street.
NEW ASH GREEN
The Hobby House,
10 Upper Street North.
NEW ROMNEY
The Corner Shop,
46 High Street.
SEVENOAKS
Sportscraft (Sevenoaks) Ltd.,
67 London Road.
SWANLEY
H. & J. Electronics,
39 High Street.
LANCASHIRE
BOLTON
Boydell Toys of Bolton Ltd.,
57a Newport Street.
FARNWORTH
Joycraft,
29 Hall Lane,
Moses Gate.
LANCASTER
Lancaster Model Shop,
8 China Street.

LIVERPOOL
Stan Catchpole's Model World,
85 Bold Street.
MANCHESTER
The Model Shop (Manchester),
7-13 Bootle Street.
NELSON
The Model Shop (Nelson) Ltd.,
57 Railway Street.
POULTON-LE-FYLDE
Hobbycrafts,
12 Tithebarn Street.
ROCHDALE
K Models,
18 St. Mary's Gate.
PRESTON
Harry Welch Ltd.,
85 Church Street.
SOUTHPORT
Hobby Shop,
(Southport) Ltd.,
17-19 Bold Street.
SWINTON
Listers Model Supplies,
285 East Lancashire Rd.
LEICESTERSHIRE
LEICESTER
Apex Craft,
22 Church Gate.
LINCOLNSHIRE
GRIMSBY
Evingtons,
5 Alexandra Road.
LINCOLN
Model Centre,
(Russell Models),
24 Newland.
Hobbins Models,
78 High Street.
SCUNTHORPE
Sherrans Model Shop,
27 Dunstall Street.
SPALDING
Charles F. Pask,
12 Vine.

ION OF TRUE MODEL AERONAUTICAL ENGINEERING!

TYPES – GLIDERS, RUBBER DURATION, SCALE, CONTROL LINE & RADIO

THE BEST KITS ARE HERE!

	Span	£.p
RADIO CONTROL		
Fournier R.F.5	72"	11.72
Hawker Tomtit	52"	21.22
Sopwith 1½ Strutter	48"	13.85
Concord	66"	17.99
Skylane	54"	9.16
Fokker D.VIII	46"	9.16
Deacon	52"	3.22
Robot	45"	7.02
Mini-Robot	36"	4.08
Mini-Concord	40"	6.53
Sky-Skooter	48"	3.06
POWER DURATION		
Vespa Minibipe	23"	1.35
Cardinal	35"	1.78
R/C SOARERS		
Fournier R.F.5	72"	11.72
Springbok	72"	8.67
Impala	52"	5.63
Big Eagle	96"	12.31
CONTROL LINE		
Bomb-bat	25"	2.23
Combateer	38"	2.73
F.W. 190 A3	33"	2.60
Nipper	17"	1.32
Philibuster	28"	2.64
Pinto	20"	3.06
Provost Trainer	19"	0.95
Spitfire	27"	3.06
Stunter	30"	2.64
Bee-Bug	22"	1.45
Colt	19"	2.33
GLIDERS		
Cirroson'c	34"	0.98
Classic	36"	0.56
Coronette	26"	0.48
Dominette	28"	0.92
Verosonic	46"	1.41
Wagtail	30"	0.58
RUBBER DURATION		
Combi-kits (4)	20"	0.63
Skywagon	23"	0.91
Citabria	22"	0.91
Fledgeling	28"	0.86
Goblin	20"	0.56
Rascal	24"	0.78
Sentinel	34"	1.41
Skylark	21"	0.63
Snipe	20"	0.63

SEE THEM ALL AT YOUR DEALERS!

All prices are recommended retail

TWO KWIK-FIX PRE-DECORATED FLYING SCALE MODELS

CESSNA SKYWAGON

23" SPAN (584mm)
All die-cut and decorated parts! Dead easy to build! Plastic Prop. Pre-shaped Undercart with fitted Wheels. Rubber Motor. Pictorial Plans. Realistic performance.

CHAMPION CITABRIA

22" SPAN (559mm)
EASY-TO-BUILD, FUN-TO-FLY!

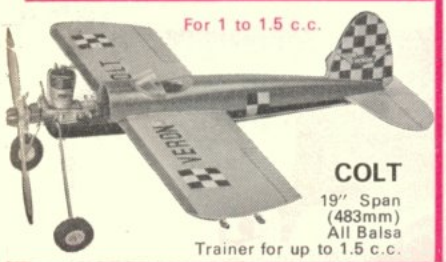
SOLARFILM

BRITISH & BEST!

NEW COLOUR – METALLIC RED

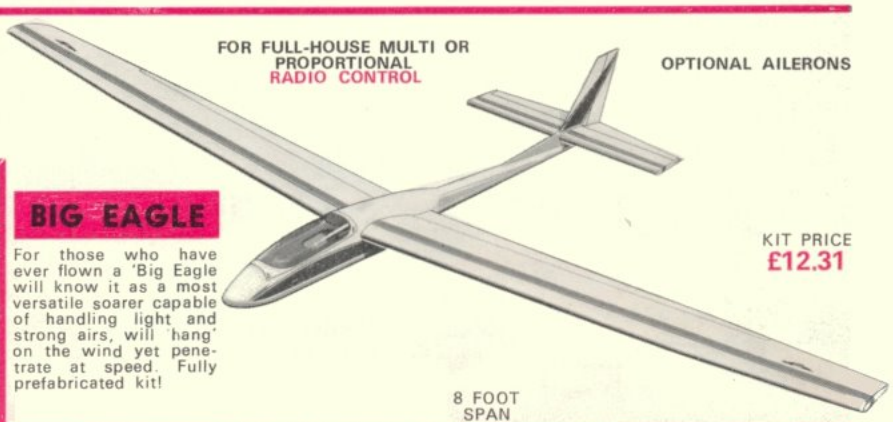
BLACK, WHITE, RED, DARK RED, ORANGE, YELLOW, MID-BLUE, TROPIC BLUE, METALLIC GREEN, METALFLAKE SILVER, METALFLAKE GOLD, METALFLAKE BLUE; TRANSPARENT-BLUE, YELLOW, ORANGE AND RED

Size	Solid & Transp	Gold & M'Flake
36" x 26"	64p	75p
50" x 26"	85p	98p
10 yd. x 266"	£6.36	£7.43



COLT

19" Span
(483mm)
All Balsa
Trainer for up to 1.5 c.c.



BIG EAGLE

For those who have ever flown a 'Big Eagle will know it as a most versatile soarer capable of handling light and strong airs, will 'hang' on the wind yet penetrate at speed. Fully prefabricated kit!

KIT PRICE
£12.31

LONDON
Aero Nautical Models, 98 Parkway, N.W.1.
Bee Models, 10 Tooting Bec Road, S.W.17.
H. A. Blunt & Sons Ltd., 133 The Broadway, Mill Hill, NW7 4RN.
Eltham Models, 54 Well Hall Road, Eltham, S.E.9.
J. & D.'s Hobbies, 118a Upper Richmond Road, Putney, S.W.15.
Michael's Models, 886 & High Road, North Finchley, N.12.
Model & Tool Supplies, 604 Kingston Road, Raynes Park, S.W.20.
Henry J. Nicholls & Son Ltd., 306 Holloway Rd., N.7.
Norwood Junction Models Ltd., 5 Orton Buildings, Portland Road, SE25 4UD.
Russ, 101 Battersea Rise, S.W.11.
W. & H. (Models) Ltd., 14 New Cavendish Street, W.1.

MIDDLESEX
ASHFORD COMMON
P. L. Whitworth, 371 Staines Road West.
WEMBLEY
Wally Kimister Ltd., 67 Ealing Parade.
WILLESDEN
Model Mart, 77 High Rd., NW10 2PU.
NORTHAMPTON
CUNDLE
Geoff Stubbs, 74 West St.

NOTTINGHAMSHIRE
NOTTINGHAM
Gee Dee Models Ltd., Goose Gate.
WOLLATON
Pegasus Models, 171 Bramcote Lane.
WORKSOP
Model Centre (Russell Models), 5 Kroyton Street.
NORTHUMBERLAND
NEWCASTLE-UPON-TYNE
The Model Shop Ltd., 18 Blenheim Street.
WHITLEY BAY
Whitley Model Shop, 67 Park View.
DXON
OXFORD
Howes Model Shop, 9-10 Broad Street.
SALOP
NEWPORT
Herbert Tucker, The Square.
OSWESTRY
The Toy & Model Shop, 24 Beatrice Street.
SHREWSBURY
Leisure Time, 1 & 2 Castle Gates.
SCOTLAND
INVERNESS
The Model Shop Newmarket Hall.
MORAY
Moray Model Shop, 265 High St, Elgin.
GLASGOW
Riddell Bros., 61 Mt. Annan Drive, Glassford's.
89 Cambridge Street.
SOMERSET
MINEHEAD
Minehead Sports & Toys, 45-55 The Avenue.

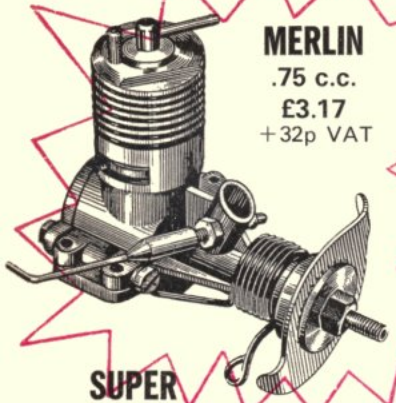
STREET
The Gift Shop (Street), 92 High Street.
SOMERSET
WELLINGTON
Zerrina, 21 North St.
YEOVIL
The Digi Hangar, 79 Princes Street.
WELLS
McPherson & Co., 1 St. John Street.
WESTON-SUPER-MARE
Weston Model Arrow Angling Supplies, 1 Oxford Street.
SUFFOLK
BURY ST. EDMUNDS
C. F. Rogers, 77 St. John's Street.
IPSWICH
Bowmans of Ipswich, 37-39 Upper Orwell St.
SURREY
ADDLESTONE
Addlestone Models Ltd., 4-8 High Street.
CAMBERLEY
Modelworld (Camberley) Ltd., 75 High Street.
CATERHAM
Caterham Model Centre Ltd., 50 Westway.
CROYDON
Heset Model Supplies, Brighton Road.
GODALMING
A. & S. Allchorne, 10 Bridge Street.
GUILDFORD
The Corner Shop, 6 Rodboro Buildings, Onslow Street.
G.D.H. Ltd., Swan Lane.

KINGSTON-ON-THAMES
Mick Charles Models, 124 Canbury Park Road.
RICHMOND
Hi-Fli Models Ltd., 6 Westminster House, Kew Road.
SURBITON
Whitewoods, 103 Brighton Road.
STAFFORDSHIRE
NR. DUDLEY
Flight Line Models, 29 Parr Lane East, Tipton.
STAFFORD
John W. Bagnall Ltd., 18 Salter Street.
STOKE-ON-TRENT
Brookfields Toyland Ltd., Trentham Rd, Longton.
WALSALL
S. H. Grainger & Co., 108 Caldmore Road.
WOLVERHAMPTON
Wolverhampton Models & Hobbies, 3 Mander Centre, Bell Street.
SUSSEX
BRIGHTON
Harry Brooks, 35 Victoria Road, Portslade.
Lewes Road Model Shop, 187b Lewes Road.
Toy & Model Market, Churchill Square.
CHICHESTER
Planet Models & Handicrafts, 108 The Hornet.
HAYWARDS HEATH
Sport-Hide Ltd., 401 South Road, RH16 4LR.

HORSHAM
Brookes Sports, 19 Freshwater Parade, Bishopric.
TEESSIDE
MIDDLESBROUGH
Modeldrome, 265 Linthorpe Road.
REDCAR
Chas. Skinner, Model Shop, 7 Dundas Street.
WALES
GLAMORGAN
Bud Morgan, 22 Castle Arcade, Cardiff, CF1 2BW.
PONTYPRIDD
The Kit Shop, 44 Richard's Street, Crais.
SWANSEA
Swansea Models & Hobbies, 11 Shoppers Walk, Oxford Street.
MERIONETH
Penrhyndeudraeth
Deudraeth Crafts and Models, High Street.
WARWICKSHIRE
BIRMINGHAM
Bobs Models Ltd., 520 Covantry Road.
Powells Model Centre, 769 Alum Rock Road.
QUINTON
Hobby Spot, 280 Hagley Road West.
MOSELEY
Ballard Bros., 133 School Road.
COVENTRY
Harveys Ltd., Cross Cheaping.

LEAMINGTON SPA
Leamington Hobby Centre, 112 Regent St.
ISLE OF WIGHT
SHANKLIN
The Sports Shop, 70-74 Regent Street.
WILTSHIRE
CORSHAM
Smiths of Corsham, 51-53 High Street.
SWINDON
Hobby's Corner, 24 Fleet Street.
TROWBRIDGE
Stroud Sims, 5 Silver Street.
WORCESTERSHIRE
WORCESTER
Messrs. A. N. Cutler, 7 Bridge Street.
CRADLEY HEATH
Dunns Model Shop, 65 Lower High Street.
YORKSHIRE
BRADFORD
Modeldrome, 182 Manningham Lane.
BRIDLINGTON
L. Dench, 36 Promenade.
CASTLEFORD
Arts Crafts & Models, 4 Castleway.
HULL
Reg. Beaumont, 150 Chanterlands Av.
LEEDS
Flying Models, 85 Crossgates Road.
SCARBOROUGH
Model Shop, 28 Bar Street.
SHEFFIELD
Sheffield Hobbies Centre Ltd., 141 London Road.

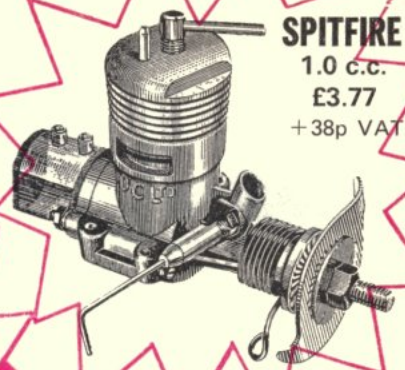
MODEL AIRCRAFT (B'MOUTH) LTD NORWOOD PLACE · BOURNEMOUTH



MERLIN
.75 c.c.
£3.17
+32p VAT

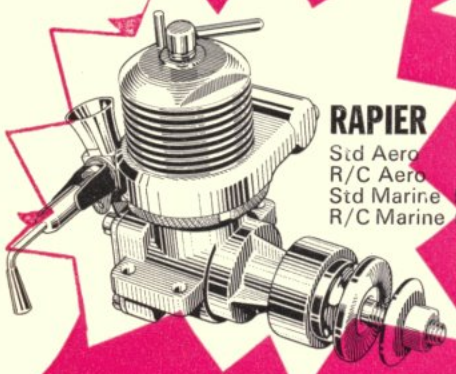
SUPER MERLIN
.75 c.c.
£3.47
+35p VAT
(not illustrated – comes with fuel tank)

DART
.5 c.c.
£4.00
+40p VAT



SPITFIRE
1.0 c.c.
£3.77
+38p VAT

SABRE
1.5 c.c.
£4.00
+40p 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

WASP
.049 c.c.
£2.35
+24p VAT

Seasonal Greetings to Aeromodellers and the Hobby Trade

The Motors for the Modern Modeller!

QUICKSTART

THE GREATEST RANGE OF SPORTS FLYERS' ENGINES

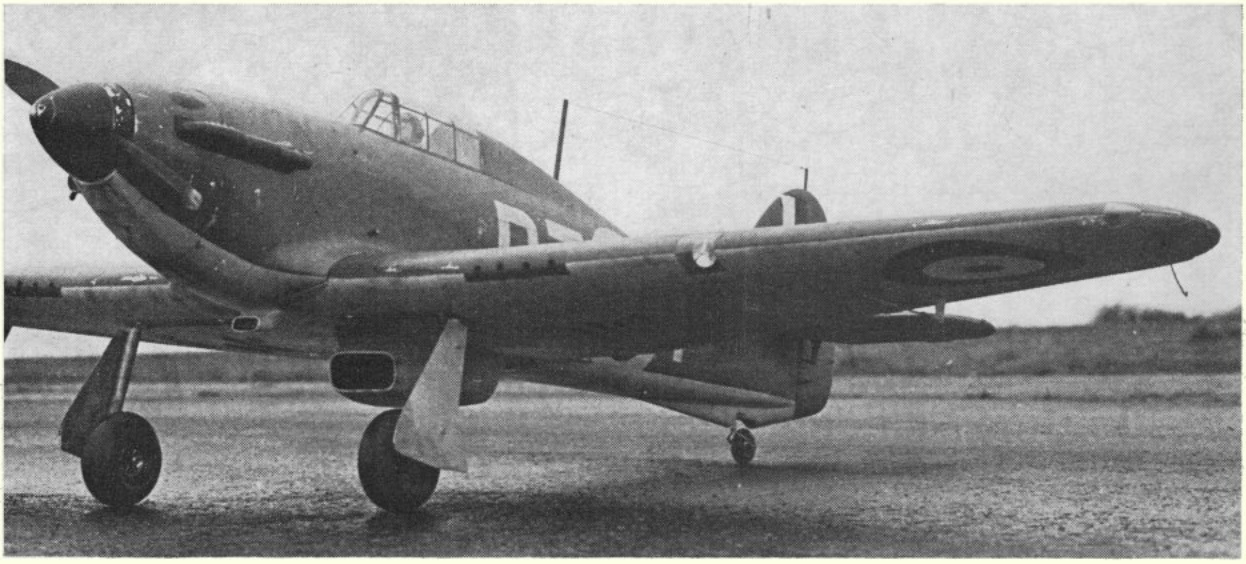
CALL IN AT YOUR MODEL SHOP TODAY

in case of difficulty write direct to:

DAVIES-CHARLTON LTD.

HILLS MEADOW, DOUGLAS, ISLE OF MAN

SOLARBO



Realism . . . even down to that authentic 'used' look. ('Aircraft in good serviceable condition, average airframe and engine hours. . . .') All done by working on the final paint finish. And to think, the problem used to be how to get that perfect 'professional finish' on every model with no marks on it. Those came from normal model wear-and-tear – and usually looked anything but realistic.

The point is that model design and airframe construction – and radio control when it comes to scale models – has virtually reached the ultimate, or so it seems. So modellers look elsewhere for further improvements. And back of all this is the same 'basic' airframe material – Balsa. Proven by nearly fifty years of flying achievements. Only the construction techniques have changed – not the material! Today – as in the early '30s – Balsa models fly better!

Provided, that is, you make sure to use the best Balsa for every job. Model airframes are called upon to do a lot more than in the old 'stick-and-tissue' days. You cannot take chances and put hundreds of hours of work at risk, so start right with *genuine aeromodelling quality* Balsa. That means Solarbo Balsa, of course – guaranteed for your peace of mind!

Happy Christmas to all Solarbo Balsa users the world over – and even more success to you in 1974!

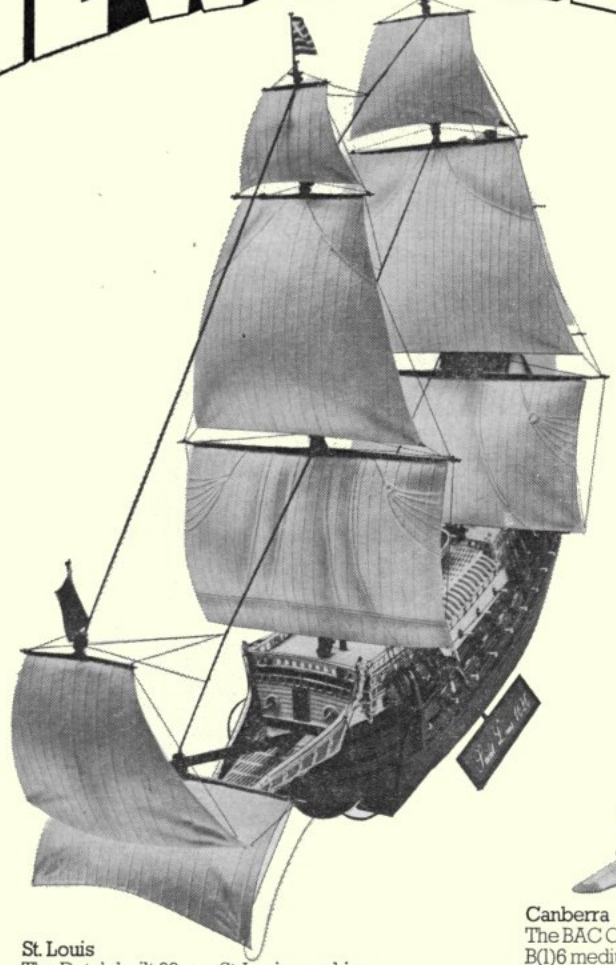
THE HOME OF GOOD BALSA

SOLARBO LIMITED
COMMERCE WAY
LANCING SUSSEX

ALWAYS ASK FOR 'SOLARBO' BY NAME

KINDLY MENTION 'AEROMODELLER' WHEN REPLYING TO ADVERTISEMENTS

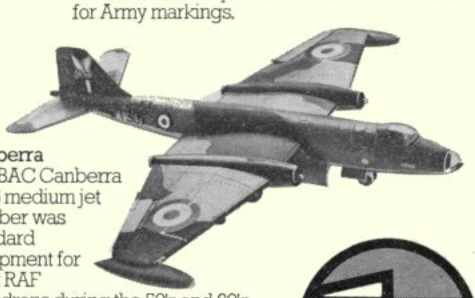
AIRFIX NEWCOMERS



St. Louis
The Dutch-built 60 gun St. Louis warship displaced some 1,200 tons and was introduced into the French Navy by Cardinal Richelieu, to give strength to the existing French fleet. This big scale kit has 189 parts plus sails, rigging and flags.

Two New Waterline Models
67 parts make up the highly detailed waterline model of HMS Hood, the largest British battlecruiser of the Second World War until she was sunk by the Bismarck. The Bismarck, one of the German fleet's most powerful and heavily armed battleships was sunk in perhaps the most famous naval encounter of the War. The kit has 49 high definition parts. These two clip-together kits are in 1/1200th scale.

SA 341 Gazelle
The SA 341 Gazelle is a streamlined 2-seater military helicopter with the unusual feature of a tail rotor built into the tail fin. The 1/72nd scale kit has more than 40 parts and includes transfers for Army markings.



Canberra
The BAC Canberra B(1)6 medium jet bomber was standard equipment for most RAF squadrons during the 50's and 60's. Either the RAF B(1)6 or Australian B20 versions can be modelled and parts include armament and drop tanks. 1/72nd scale.

AIRFIX

The world's biggest range of construction kits

Aero Modeller

INCORPORATING
MODEL AIRCRAFT

December 1973 Volume XXXVIII No. 455

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.

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.)

The Editor and Staff of Aeromodeller send seasonal greetings and best wishes for a happy and prosperous New Year to all our readers.

on the cover

Bill Bertrand with huge one-quarter scale version of the Aeronca LB which placed ninth in the radio-controlled scale category at the U.S. Nationals. Impressive on the ground, it was equally so in the air, being very stable and smooth, the Webra 60 providing just the right amount of power. A Dick Stouffer photograph.

next month

Plans for 'Bolero', a 76 in. span thermal soarer, ideal for your first introduction to radio-control flying. Having difficulty with the 'ironmongery' on your latest model? Then see our feature on basic metalwork. How do you achieve a lightweight finish to your model? That too is explained, as is the fitting of a clockwork dethermaliser to a glider. These are just some of the topics which, together with regular features, will appear in the January issue, on sale December 21st.

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

RipMax

The Compliments of the Season to all Aeromodellers . . .

. . . now offer you an even wider range of THE WORLD'S BEST KITS. Here are some of the latest additions (and old favourites!) from STERLING . . . GOLDBERG . . . and TOPFLITE. All specially picked for their QUALITY AND VALUE!

NEW! . . . all at £4.25!

CURTISS JN-4 JENNY

KIT E1 Scale 1" 1 Ft. Span 32¾"

FOKKER DR-1 TRIPLANE

KIT E2 Scale 1" 1 Ft. Span 23½"

DIAMANT SAILPLANE

KIT E3 Scale 1⅜" 1 Ft. Span 74"

Rubber powered (as supplied) . . . or readily adapted to powered free-flight, C/L or R/C!

also (not illustrated)

33½" CITABRIA 1" scale £4.25
35½" PIPER SUPER CRUISER £4.25
27" P-40 WARHAWK ¾" scale £4.25

SCHWEIZER 1-34 ... £17.50
Giant 98½" span true-scale sailplane. A superb kit of this outstanding design – specially designed with R/C in mind!

70" SCHWEIZER 1-26D ... £13.25
42¾" SCHWEIZER 2-32 ... £2.10
also **CIRRUS 87¼" span £6.35**
For towline, slope soaring – free-flight or R/C. An outstanding kit.

SUPER SCALE CONTROL LINE

35" CHANCE-VOUGHT CORSAIR F4U1 £8.50
33" RICKENBACKER'S NIEUPORT 28 £8.50
32½" super detailed FOKKER D-7 ... £7.95
32" true scale SE5 biplane £7.95
32¼" STEARMAN CROP DUSTER ... £7.95
36" GREAT LAKES TRAINER ... £9.00

SUPER SCALE R/C *(not illustrated)*

64" SPITFIRE £29.20
64½" STEARMAN PT17 ... ...£34.50
58½" FOKKER D-7 £33.45
40½" SE5A ... £16.95
70" KING COBRA £25.45
45" CESSNA 180 £8.50
54" PIPER CUB £9.50
48" FAIRCHILD PT19 £10.10
66" MUSTANG £29.20
72" SUPER PIPER £21.20

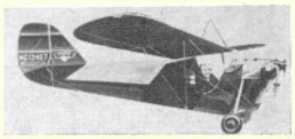
FREELANCE R/C

SUPER LANCER £22.30
62" span fully aerobatic model.
LANCER 53½" span ... £16.95
RIMFIRE 56" span ... £15.90
CITABRIA 54" span ... £15.95

WIZARD BIPE
54" span **£15.90**

RUBBER POWERED

Detailed SCALE MODELS with IN-FLIGHT ACTION FEATURES. Fully prefabricated kits with die-cut and plastic parts, rubber motor, hardware, etc. EASILY CONVERTED to engine power for control-line or R/C!



Aeronca C-3 36" span ... £3.20
Fokker D-7 24" span... ... £3.20
Nieuport 17 bipe 24" span ... £3.20
AT-6 Texan 18" span ... £1.60
Piper Super Cub 18" span ... £1.30
Cessna 180 17" span £1.30

Fokker Eindecker 25" span ... £2.40
P-51D Mustang 24" span ... £3.20
SE5A biplane 22" span ... £3.20
Jap Zero 24" span £3.20
Spitfire Mk. I 24" span ... £2.65
Sopwith Camel 24" span ... £3.20

Beechcraft Bonanza 22" span £2.40
Ju 87 Stuka 20" span ... £2.40
Messerschmitt 109 17" span... £1.60
Curtiss Hawk P6E 16" span £1.85
L-19 Birddog 17" span ... £1.30

Stearman PT-17 22" span ... £2.65
F4U-5 Corsair 24" span ... £3.70
Ansaldo SVA 5 19" span ... £1.85
Focke-Wulf 190 24" span ... £2.65
Thunderbolt P-47 20" span ... £2.40

Prices may be affected by fluctuating exchange rates, etc.

Sterling MODELS distributed by RipMax

see them AT YOUR MODEL SHOP!

KINDLY MENTION 'AEROMODELLER' WHEN REPLYING TO ADVERTISEMENTS

CARL GOLDBERG

SKYLARK 56 ... £15.60

Fly as single- or twin - engined! Parts for both in kit!

56" span for engines up to .19 (or twin .09)

also 37" span JR SKYLARK £5.95

DISTRIBUTED BY RIPMAX

Semi-Scale Beauty in a Great Flying Model!

for .35-.45 engines.

SKYLANE 62

£25.80

Tough, Roomy Cabin and Front End, for 2 to 4 Channel Propo. Steerable Nose Gear. Span 62". Weight 4½-5 lb.

also SKYLANE 42 de luxe £6.60

THE FLYING FALCONS!

FALCON 56 ... £13.75 SNR FALCON £25.75
JNR FALCON £5.40

Specially designed for R/C

GOLDBERG KIT FEATURES:

- All de luxe with top quality parts
- Coil-sprung nosegear, formed main undercarriage legs
- Die-cut ribs, fuselage sides, formers and other sheet parts
- Shaped and notched LE's and TE's
- NEW 'Symmet-TRU' wing construction for easy, accurate assembly

GOLDBERG CONTROL LINE

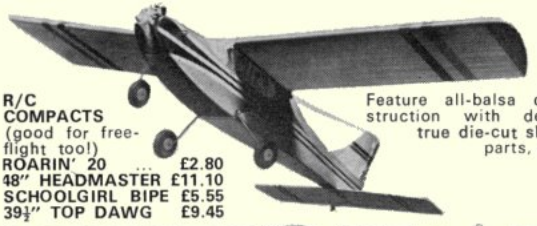
JNR SATAN (right) 29" span £2.70
L'IL SATAN £2.10
RILEY WOOTEN VOODOO 36" span Combat £3.30

L'IL WIZARD £2.70 21" span for .049s.
L'IL JUMPIN BEAN 21" span £2.35
SWORDSMAN 18" sp. stunt (.049s) £2.35
SHOESTRING STUNTER 42" span £5.35

TOP FLITE

stand-off scale KITS

Superbly realistic R/C models with full scope for ACTION FEATURES (like retract undercarriage for example)



R/C COMPACTS (good for free-flight too!)
ROARIN' 20 ... £2.80
48" HEADMASTER £11.10
SCHOOLGIRL BIPE £5.55
39½" TOP DAWG £9.45

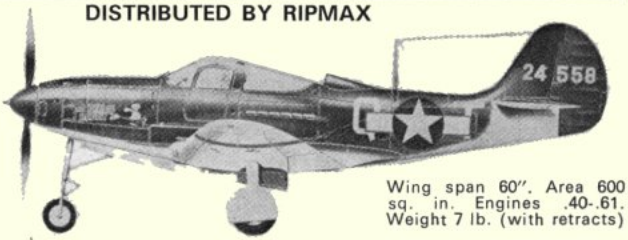
Feature all-balsa construction with dead-true die-cut sheet parts, etc.

CONTROL LINE

NOBLER £10.00
Famous 50" stunt champ!
JNR NOBLER ... £6.10
40" span for .15-.19s.
PEACEMAKER ... £6.95
46" span fully aerobatic.
42" FLITE STREAK £4.95
JR FLITE STREAK £3.90

SEMI-SCALE STUNTERS
With formed fuselage shells, other shaped parts & hardware.
42" span HURRICANE £5.55
42" P-40 TIGER SHARK £5.55 also
28" WARHAWK scale £7.75
27" THUNDERBOLT £7.75
37" MUSTANG £11.10

DISTRIBUTED BY RIPMAX



Wing span 60". Area 600 sq. in. Engines .40-.61. Weight 7 lb. (with retracts)

P-39 AIRACOBRA £29.25

Wing span 60" Engines .40-.61 Weight up to 7 lb. with radio gear

P-51 MUSTANG ... £27.80

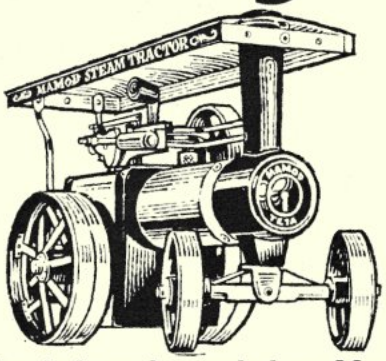
Wing span 60" Engines .40-.61 Weight up to 7 lb. all up with radio

£29.25 P-40 WARHAWK

IF IT'S RipMax IT'S GOOD!

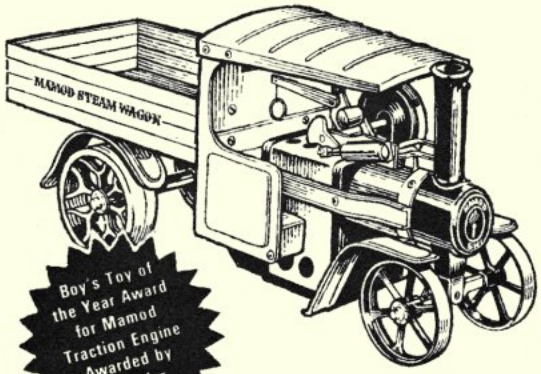
SEE THEM ALL AT YOUR MODEL SHOP

For boys of all ages



For kids, dads and grandads, a Mamod working steam model is something to get really steamed up about all the year round. Precisely engineered traction engine, steam wagon, steam roller, stationary steam engines and accessories, wagons to tow.

Prices from £2.45 (tractor £8.14 steam wagon £11.83) from all leading toy shops.



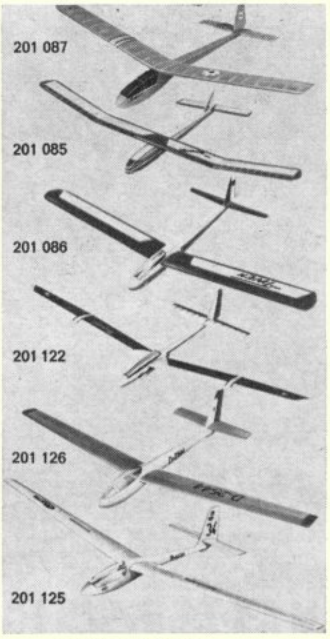
Boy's Toy of the Year Award for Mamod Traction Engine Awarded by NATR for 1972

Mamod

Malins (Engineers) Ltd.,
Brierley Hill, Staffordshire.

Hegi

SCHUCO



GLIDER KITS

PAT (087) **£7.10**
47½" span semi-scale

SPASSVOGEL (085) ... **£6.40**
50¾" span hi-performance

TWEN (086) **£8.05**
55" span mid-wing soarer

KADI (122) **£15.80**
74" span super sailplane

ALADIN (126) ... **£21.20**
86½" span. Ideal for R/C

ASW-15 (125) ... **£44.75**
118" span scale sailplane for free-flight or R/C
(not illustrated)

SB7 90½" span ... **£16.35**
T-tail scale sailplane, adapts to power. Superb for R/C flying – especially slope soaring!

SULTAN 47¼" span ... **£4.10**

See all these MODERN KITS at your local model shop. New designs that give you something different in the glider and sailplane world!

All fully tested and flight-proven – with the accent on superb towline stability!

Every model also designed with radio control in mind!

POWER KITS

FRECHDAX (233) ... **£9.85**
43¾" span cabin, trike u/c.

SNOOPY (235) ... **£19.60**
58½" span. Ideal for R/C.

T45 (242) **£24.10**
51¼" R/C sports and trainer for engines up to 6.5 c.c.

BURDA PIPER (240) **£28.80**
Superb 71¼" span scale model.

LEAR JET (241) ... **£48.60**
61" span for 10 c.c. engines.
(not illustrated)

L19 BIRDDOG 47" span £11.20

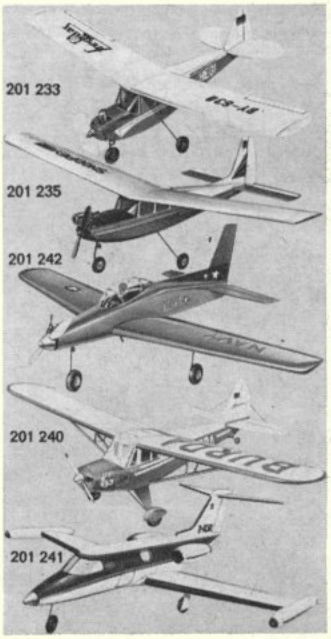
PIPER TWIN COMANCHE £29.90

CESSNA 210 55" span £21.30

FOKKER D-8 50" span £16.35

AUSTER AIGLET 47¼" span £10.20

HEGI 70 39¾" span ... **£11.80**



HELICOPTER MODELS!

Designed by Dieter Schluter in easy-to-assemble kit form. Moulded fibre-glass fuselage. Precision-made mechanical parts and hardware, etc. Power by any 10 c.c. motor. Easy to fly by R/C because of the excellent stability and control characteristics!

BELL HUEY COBRA Fuselage & Hardware kit ... **£55.00**
Mechanical Parts Kit **£135.00**
also
DS-22 HELICOPTER **£173.50**
Complete Fuselage & Mechanical kit.

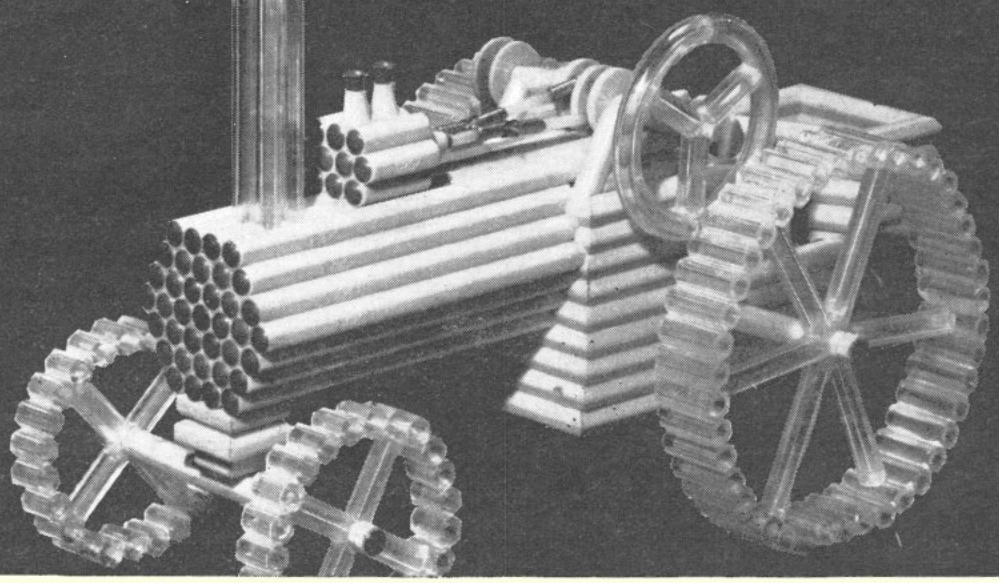
see SCHUCO at YOUR MODEL SHOP

This Traction Engine

made with used BIC ballpens won £250!

(Mr. Laurie Burrows Traction Engine)

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.



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.

DON'T THROW AWAY YOUR OLD BIC CRYSTAL BALLPENS, SEND YOUR MODELS TO THE

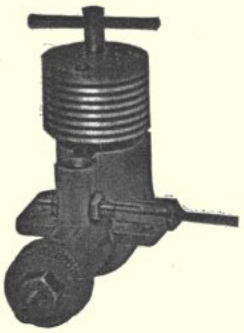
c/o Montague House, 23 Woodside Road, Amersham, Bucks.

BIC **Model Making Competition**

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

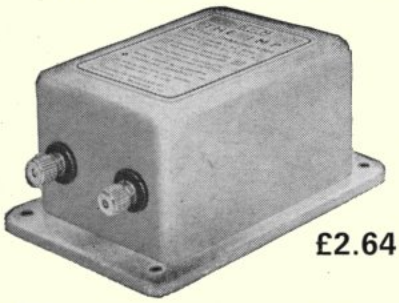
All engines are now specially ported to produce a good performance when used with silencers or mufflers. All now also feature Squish Head type combustion chambers.

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

TWO USEFUL BATTERY CHARGERS!



The **IMP**

6 VOLTS D.C. AT 1½ AMPS

£2.64 inc. V.A.T.

The **SUPERGLOW**

2 VOLTS D.C. AT 1½ AMPS

£2.64 inc. V.A.T.

Send for free price list

56-page Power Control Manual **20p**

Trade inquiries welcomed

HAMMANT AND MORGAN

HANDEM WORKS, APEM ESTATE, ST. ALBANS ROAD, WATFORD, HERTFORDSHIRE

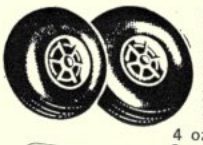
KAVAN

model airplane parts

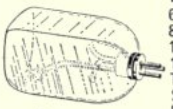
SILVERED NYLON SPINNERS

1¾" dia. ¼" UNF	74p	1¾" dia. 7mm thrd.	74p
2" dia. ¼" UNF	83p	2" dia. 7mm thrd.	83p
2¼" dia. ¼" UNF	92p	2¼" dia. 7mm thrd.	92p
2½" dia. ¼" UNF	£1.00	2½" dia. 7mm thrd.	£1.00

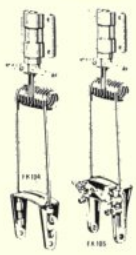
RIPMAX-KAVAN AIRSPAN WHEELS



Standard per pr.		Whitewall per pr.	
1¾" dia.	75p	1¾" dia.	£1.00
2" dia.	82p	2" dia.	£1.07
2¼" dia.	89p	2¼" dia.	£1.14
2½" dia.	96p	2½" dia.	£1.21
2¾" dia.	£1.02	2¾" dia.	£1.27
3" dia.	£1.09	3" dia.	£1.34

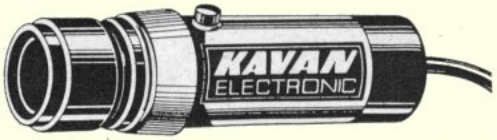


4 oz. Sealite square Klunk tank	68p
6 oz. Sealite square Klunk tank	73p
8 oz. Sealite square Klunk tank	78p
10 oz. Sealite square Klunk tank	83p
14 oz. Sealite square Klunk tank	92p
Take-apart filter	21p
Silicone fuel tubing 20"	42p
Rubber fuel tubing 40"	21p
Squeeze bottle	95p
Glow Plugs: Hot – **60p**, Warm – **67p**, Cold – **73p**, Super – **79p**, Speed – **85p**	
Push-on Glow clip	82p
Plug spanner	55p
Venturi muffler	£3.65
Short steerable nosegear	£2.30
Long steerable nosegear	£2.50
Steerable nosegear with brake	£2.75
Painted pilot (bust)	42p
Chicken finger	28p
Nylon wing fixing bolts (pair)	28p
Rubber wing seatings (pair)	46p
Control surface fairings (pair 32") ¼" **18p**, 5/16" **23p**, ⅜" **28p**	



RIPMAX-KAVAN CONTROL ACCESSORIES

Black Kwiklink 5" rod	16½p	Push rod end caps (2)	21p
Silver Kwiklink 5" rod	20p	Adj. aileron horns (2)	34p
Silver Kwiklink 8" rod	22p	Diff. aileron horns (2)	42p
Nylon Kwiklink 8" rod	14p	Flat nylon hinge (10)	45p
Kwiklink only (pairs) black **20p**, silver **28p**		Nylon horns (pr.) short, med. long	14p
Light snake, Nylon	28p	Ball link with 8" rod	28p
Light. snake, silver	34p	Ball link only	21p
Heavy. snake, silver	42p	Keeper with 8" rod (2)	21p
Kwiklink, connector (2)	42p	Nylon link, 8" rod	14p
Snake tubes: Small **7p**, Med. **8p**, Large **9p**		Nylon link only (2)	21p



RIPMAX-KAVAN STARTER **£13.30**

A DE LUXE STARTER with epicyclic gearing. With interchangeable spinner drivers and integral V-belt pulley. BRUSH-LIFT SWITCHING for positive working and reliability. 12-volt operation for medium and large motors (6v. for small motors). Accessories available.

AT YOUR MODEL SHOP

DISTRIBUTED BY RIPMAX

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

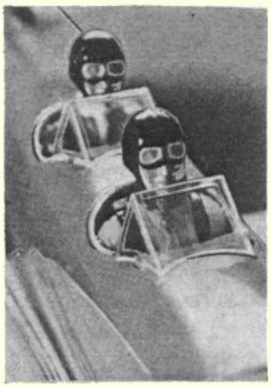
MacGregor Radio Control,
Canal Estate, Langley, Bucks. SL3 6EQ

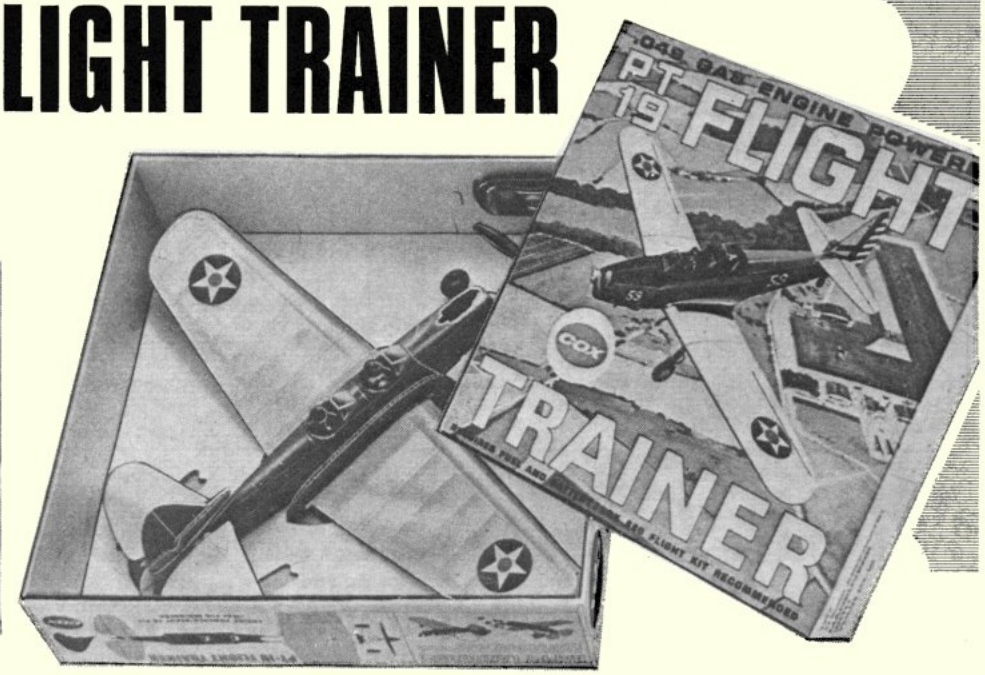
Write to us today enclosing a stamped addressed envelope for more details or call and see our products for yourself at your local model shop. We feel sure you'll want us to help you make your wish come true!

with the

PT19 FLIGHT TRAINER

COX





Cox's all-time popularity winner, this is a superb airplane for the beginning flyer. The PT-19 has trained more control-line enthusiasts than all others. Features exclusive adjustable thrust angle that can be set for super stability for the beginner and gradually increased for more advanced flying. Powered by a Cox .049 engine.

Another exclusive Cox feature is the rubber band assembly which permits the plane to come apart without breaking when it crashes, then to be quickly and easily reassembled. Has wire landing gear to absorb the shock of hard landings. Complete with student and instructor pilot figures, control handle and lines. Wingspan 22".

Price; .. .. £8·05

Most of our modern Jet Pilots learned to fly on piston engines

A. A. HALES LTD

P.O. Box 33 ____ Hinckley ____ Leics.

HALES
LEADER IN THE WORLD OF MODELS

EURO-MODELS: EXCLUSIVE

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

'AEROPICCOLA' NEW AERO ENGINE STARTER

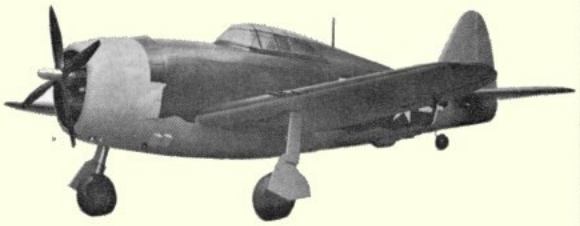
No more bad language, chopped fingers, non-starts, rebound jars, grated knuckles.

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.

Complete-a-Pac

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



Above C.A.P. Razorback P47 Thunderbolt was built and flown by R. P. Brown—Brighton.

C.A.P. No. 4 P47 'Thunderbolt' 61½in. span R/C model. 40 power upwards. Razor and Bubble versions shown on plan. Plan £2.20 including V.A.T.
Pre cut kit £24.20 including V.A.T.

SINGLE ITEMS TO HELP PLAN BUILDERS
Glass Fibre Cowling £2.20 plus 22p Post and Packing.
Razor or Bubble Canopy 77p plus 11p Post and Packing.
Transfers £1.54 POST Pd.

Kit includes: All parts cut to shape. Ample sheet and strip balsa. Radio Fittings. Nylon covering. Transfers. Canopy. Engine mount and preformed undercart wires. Please note, we do not manufacture the scale propeller as illustrated.

Please send nine pence postal order or 8in. x 4in. S.A.E. and six pence postal order for our latest Pink Cover Lists.

MICK CHARLES MODELS

Call at the R/C World Champion's model shop—

For everyone! —for all your modelling needs

RADIO CONTROL EQUIPMENT, ENGINES, KITS AND ACCESSORIES – EVERYTHING YOU NEED TO COMMENCE and COMPLETE YOUR MODEL!

● **WHY NOT ORDER NOW?**
A small deposit will secure any item for Christmas.

● USUAL OPENING TIMES –
Mon. Tues. Thurs. 9-6.30 Wed. 9-1 Fri. 9-9 Sat. 9-7.30
★ **SPECIAL CHRISTMAS OPENING TIMES** ★
★ **FRI. 21st DEC. to MONDAY 24th DEC.** ★
★ **OPEN EVERY DAY – 9 a.m. to 9 p.m.** ★

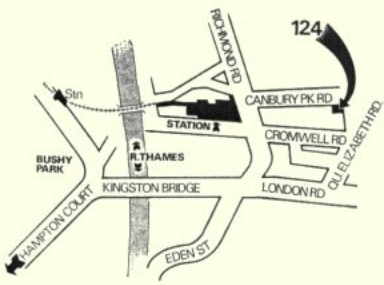
Mail Order H.P. Barclaycard Access Paybonds

124 CANBURY PARK ROAD
KINGSTON-UPON-THAMES

Tel: 01-546 4488

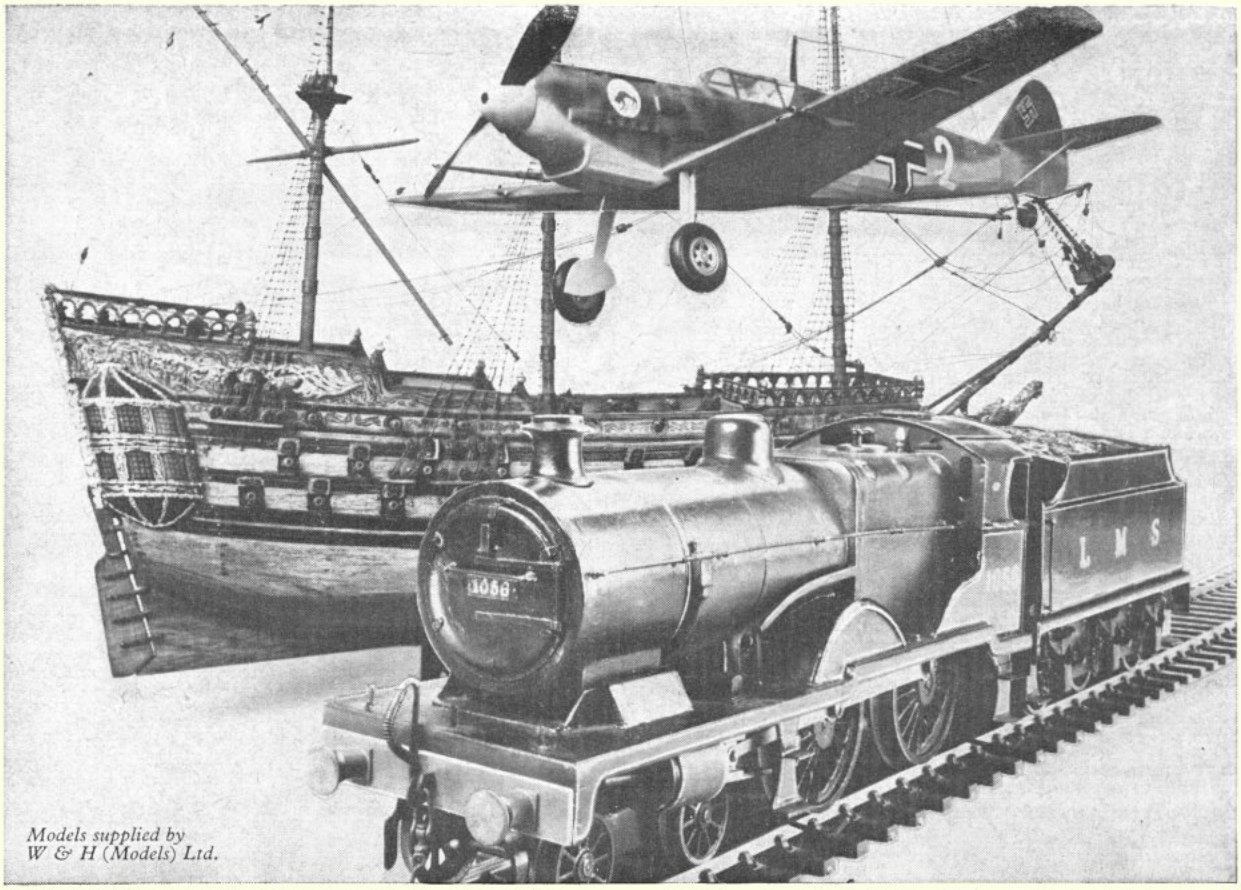
INSTANT H.P. AVAILABLE ON GOODS OVER £20.
Phone or send for forms. (No Deposit.)

200 yards from Kingston Station, close to Bus Routes



MAIN AGENTS FOR:
RADIO
SKYLEADER
FUTABA
MacGREGOR
HELICOPTERS
SCHUCO
GRAUPNER
KAVAN
ALL IN STOCK

KINDLY MENTION 'AEROMODELLER' WHEN REPLYING TO ADVERTISEMENTS



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.

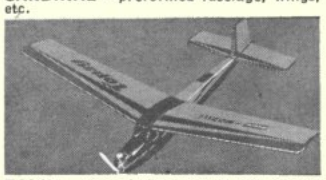
AVAILABLE FROM ALL GOOD MODEL SHOPS

Graupner for top quality!

TERRY – preformed wings and tail parts.

BO 209 MONSUN – prefab for rubber power.

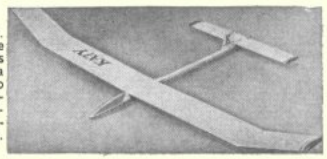
CARDINAL – preformed fuselage, wings, etc.

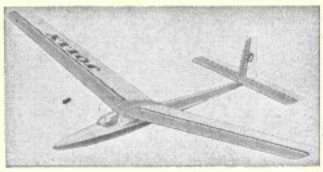


TOPSY – top of the pops of 049 power!

KATY A2 SAILPLANE

Ultra modern towline contest glider. Quickie kit includes milled fuselage nose, wing fairings and other parts moulded in plastic, die-cut balsa parts and all other items needed to complete this super high-performance model quickly and easily. Conforms to A2 specification and includes all the latest ideas in design. Wingspan 67¼". Length 39".





JOLLY A1 GLIDER

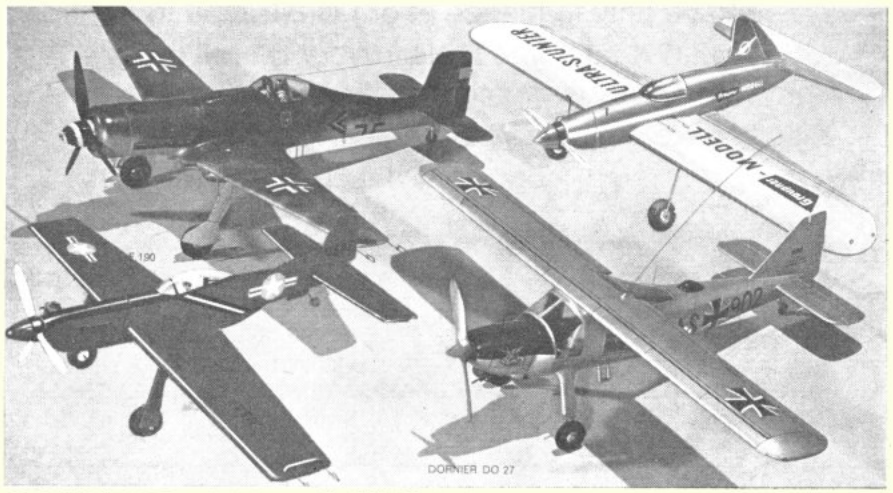
A 45" span Quickie model. This kit is extensively prefabricated and very complete. Model takes pylon mount for conversion to power. (Recommended motor Cox Pee Wee.) Kit contains quickbuild plan, printed and die-cut balsa, ply parts strip, dowel, wire parts, tissue, cement, decals, etc. Pylon mount kit is an extra.

CIRRUS SAILPLANE

Giant 118" span. A fabulous kit with finished fuselage mouldings in ABS plastic, precut wood parts, complete hardware, moulded canopy, control horn, cement, covering material, etc., etc.
Also **CUMULUS** 2800 110" span injection moulded plastic parts.

THE PROVEN GRAUPNER WANKEL!

A masterpiece of model engineering development. Power output 0.62 bhp at 16,000 rpm with smooth, smooth running. The size is compact, too – approximately 3" diameter and less than 4" overall – a better shape for most model aircraft installations. Over six years' development in bringing this modern rotary piston engine up to production requirements – and extensively test-flown.
Basic engine £64.90. Finned cooling ring **£2.20.** Radial mounting plate **£2.50.** Silencer **£4.30.** Special Glow Plug **£1.50**



CONTROL LINE

The FW 190 (engines up to .15) or the DORNIER (.09 engines) for scale fans! ULTRA STUNTER takes engines up to 1.5 c.c. Mustang up to 2.5 c.c.

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 67½" 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 28½" span	£8.70
KWIK FLY MK3 59½"	£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

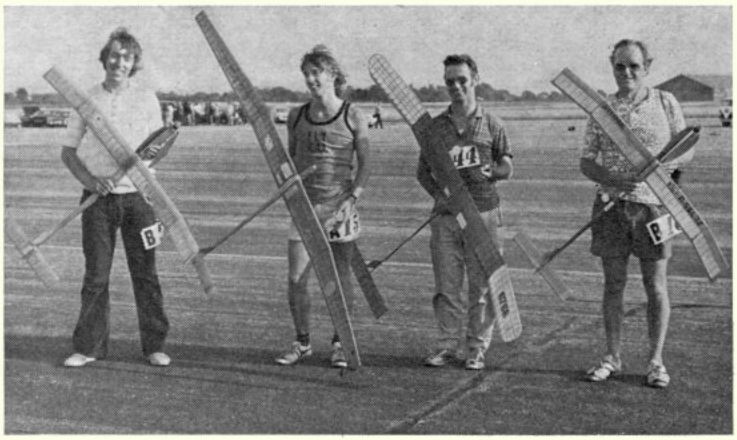
CONTROL LINE

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.

Heard at the HANGAR DOORS



Group of fliers from the North-West competing at the FFn International – reported on page 698 – consisting of (l to r) Mike Duce, Dave Barnes, Dave Yates and Joe Barnes.

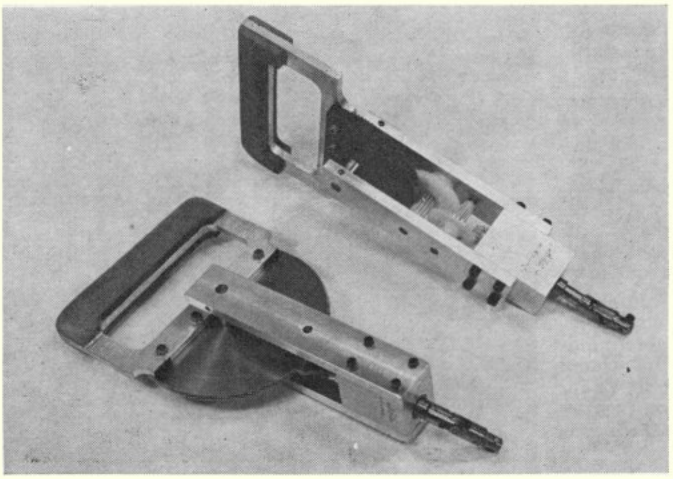
ELECTRIC power specialist Fred Militky, well known for his Graupner designs and cover subject of this year's *Aeromodeller Annual,* has made another 'world-first'. On Sunday, October 21st, his dream of electric-powered *full-size* flight came true at an Austrian airfield. For months Fred had worked with Herr Brditschka on the conversion of a Raab 'Krake' motor glider from Puch two-stroke to Bosch electric power. The 39 ft. aircraft, known in Austria as an HB-3 after its builder, became an MB-E1 (Militky, Brditschka-Electric One) as a test bed for a special design to follow. First flight, expected to be just a 'hop' of 100 yards turned out to be a nine-minute circuit up to 1,000 ft. with Heino Brditschka at the controls. Conversion was little more than replacement of the standard engine with Varta Nickel Cadmium batteries and belt drive for the Bosch 10 kW motor. With development, the future for electric power seems wide open. Congrats to all concerned! Now – bearing in mind that fuel crisis . . . has anyone thought of enlarging a CO_2 motor?

SPATE of Soviet record claims to the F.A.I. has covered the range from Helicopter distance, to free-flight speed, and now R/C glider duration. The figure for the latter is . . . hold on, folks – 25 hours 44 minutes 08 sec., by which time Valery Myakinine and assistant Boris Chkourski must have been ready for relief! This long, long, long flight was made from 30th September through to 1st October – the claim awaits homologation.

SYMPOSIUM and EXPO dates for 1974 have been announced and cash prizes even greater enlargement than for 1973. The Sywell EXPO organised by the Barnstormers takes place on Easter Sunday/Monday, April 14/15th at the popular Northampton Airfield while the Esher & D.M.F.C. announce their function for May 4/5th at Kempton Park Racecourse, not far from London Airport. Make each a date next year.

OCTOGENARIAN 'Rip' we can now call him, and *jolly good too,* as he would say himself. C. A. Rippon, to whom countless modellers owe so much for their guidance and tuition which has in so many instances led to successful careers in aviation via aeromodelling, reached his 80th year in October. Sprightly and cherubic as ever, we found him admiring the Chauviere prop on Shuttleworth's Bristol Fighter during the last Old Warden display of '73. It was, he said, very likely one he helped to carve when a lad in the first propeller workshops. 'Rip' has seen the tableau of flying from Graham White to Concorde. His 'apprentices' from the first model shop at 2a Hornsea Rise (Premier Aeromodel Supplies) include full-size designers now responsible for advanced projects that are a far cry from those days of bent reed wingtips and plug-in bamboo undercarriages Congrats to 'Rip' – and many more happy birthdays.

SIR ALAN COBHAM, pioneer of Air Refuelling, and founder of the famous barnstorming air displays of the thirties died last month. His connection with aeromodelling stemmed largely through his Presidency of the West Sussex M.A.S. and his tenancy of Ford Aerodrome. He allowed the Society to use the airfield, where his Air Circus was stored in winter months. In the late '30s modellers shared the airfield with exotic types like the prototype Fairey Hendon, Vickers Virginia, etc., until the Navy moved in during 1938. Indirectly, Sir Alan brought many modellers in to the hobby by his five-shilling flights in Avros and Spartans which stimulated air-mindedness among youngsters to an enormous degree. Today the Barnstorming continues – and we hope will also generate more enthusiasm for the air.



One of the major obstacles to speed flying is obtaining the necessary equipment. One person to the rescue is Allen Lee of 'Swiss Villas', 40 Poplar Grove, Sale, Cheshire who can make these Uniline handles to special order. Far left is an example using steel and brass gears, the other uses Tufnol and De rin gears, the costs being £27.50 and £23 respectively for these superbly engineered items. Allen can also undertake engine tuning work – a letter will bring further details.

Predator

50 in. span Open Class rubber duration model with an incredible contest record, despite its uncomplicated nature. Designed by Canada's MIKE THOMAS

OCCASIONALLY a classic contest model appears – the *Dixielander* and *Nig-Nog* are Power examples. These models are characterised by a combination of high performance, consistency and ease of trimming by a wide range of differing modellers. In the writer's humble (not so humble!) opinion, the *Predator* is one which falls into this category. It has high performance, being capable of more than six minutes without thermal help, and it is consistent; the four prototypes have never failed to max during the past six years! The ease of trimming is its biggest asset; the model has been demolished in windy-weather tree landings then glued together and flown in contests without any intermediate trimming flights. During the past six years the originals have had 14 first places, seven second places, three thirds and never placed lower than fourth. The model's two-and-a-half minute motor run helps considerably in making maxes!

The secret of *Predator's* success lies in the high power/weight ratio and very low all up weight. The overall weight is a very important factor, as this not only affects the total height gained, but also the glide. Every effort should be made to keep the weight below 6 oz., reducing the rubber weight if necessary.

The rolled balsa type fuselage has the advantage of very quick building, strength, and ease of repair. The tube will withstand most motor breakages without bursting, making the use of a winding tube unnecessary. When the motor tube is damaged, the repair consists merely of gluing the pieces back together again! The rear peg pulls straight out from the rear of the motor tube, so that in the event of a motor breakage, a wire can be inserted through the peg and the whole mess pulled straight out.

The fin, which is strapped to the fuselage side has several advantages: it is easier to build true (upper and lower fins are in one piece), it is lighter and stronger since all spars and covering run the whole length, it is less vulnerable as the fin will move in a hard landing and finally the trimming for turn is simply achieved by means of shims – just like a tailplane.

The wings, which are very light and relatively strong, are further protected by the wing braces, which not only enable the spars to be reduced, but also protect the wing. When the wind blows over the model, the wings merely pivot downwards against the tension of the upper rubber bands. This idea was borrowed from George Wools' *Aeromodeller* plan, the *Upstart*. The centre section has geodetic construction, the tips have straight ribs for lightness. The nose block is built up for lightness and the all-wire hub is, I think, unique. There is no quicker way to build an accurate hub and there is no lighter system.

To the victor, the spoils! If all Mike's prizes have been as impressive as this trophy, he will have to build a special annexe to his home to accommodate them . . . rather a contrast to the small plaque which most of our rally organisers provide.

Very careful note has been made of all the sheet wood grain and weights used on these models, while all strip material is cut from sheets of known grain and weight. Because of this, an almost exact prediction of the weight and strength of a new model can be made, which means that each model can be made just that bit lighter than the preceding one – now, the power/weight ratio is even higher and the glide better! In spite of the lightness, the model will bounce and come apart rather than break: in fact, it will break less frequently than a stronger, heavier model whose inertia is higher.

The only disadvantage of this design is that it is rather slim, and therefore tends to go out of sight in windy weather fly-offs sooner than big 'chubby' models, although I feel that the extra performance gained from this slimness more than compensates for the disadvantage.

Construction

The fuselage is rolled from a sheet of 1/16 in. x 4 in. x 36 in. balsa – try to keep the bare weight of the wood under 0.4 oz. Give four coats of dope thinned 50% to one side – when dry the wood tends to curl and this also protects the inside against rubber lubricant. Soak in water for five minutes, wrap round a solid rod form, then bind with gauze bandage and allow to dry for a couple of days. Remove from the form and cement seam. The tail boom is made in a similar manner, except that even lighter wood is selected; the sheet is tapered in thickness by planing and sanding down to 1/32 in. thick at the tail-end. For a form, select the nearest size in coffee table legs – the actual amount of taper in the boom is unimportant – so just choose the best looking leg! Do not pre-dope; just soak, wrap and bind before cementing the seam. Talking of cement, be sure to select a non-shrinking cement such as PVA or such a lightweight structure will warp all over the place. If possible, thin down the cement a little and use as sparingly as possible. Balsa cement is definitely 'out' in this instance!

The wing, like all the airplane structure, should be built with as light but as stiff a wood as you can get; the ribs should be quarter-grained for stiffness. In the geodetic centre panels, glue in the straight ribs, then score halfway through the thickness of the diagonal ribs, crack and glue against the straight ribs. The straight ribs are cut with the spar slot included; the spar slots in the diagonal ribs are cut after assembly. Use epoxy to glue the wing bracing wire and hooks. Cover with lightweight Jap tissue then give centre panels three coats of very thin dope. I give the tips one thin coat of dope and then spray on one thin coat of the red fluorescent automobile lacquer from an aerosol can.

Build the tailplane just like the wing; build it very light and go easy on the dope.

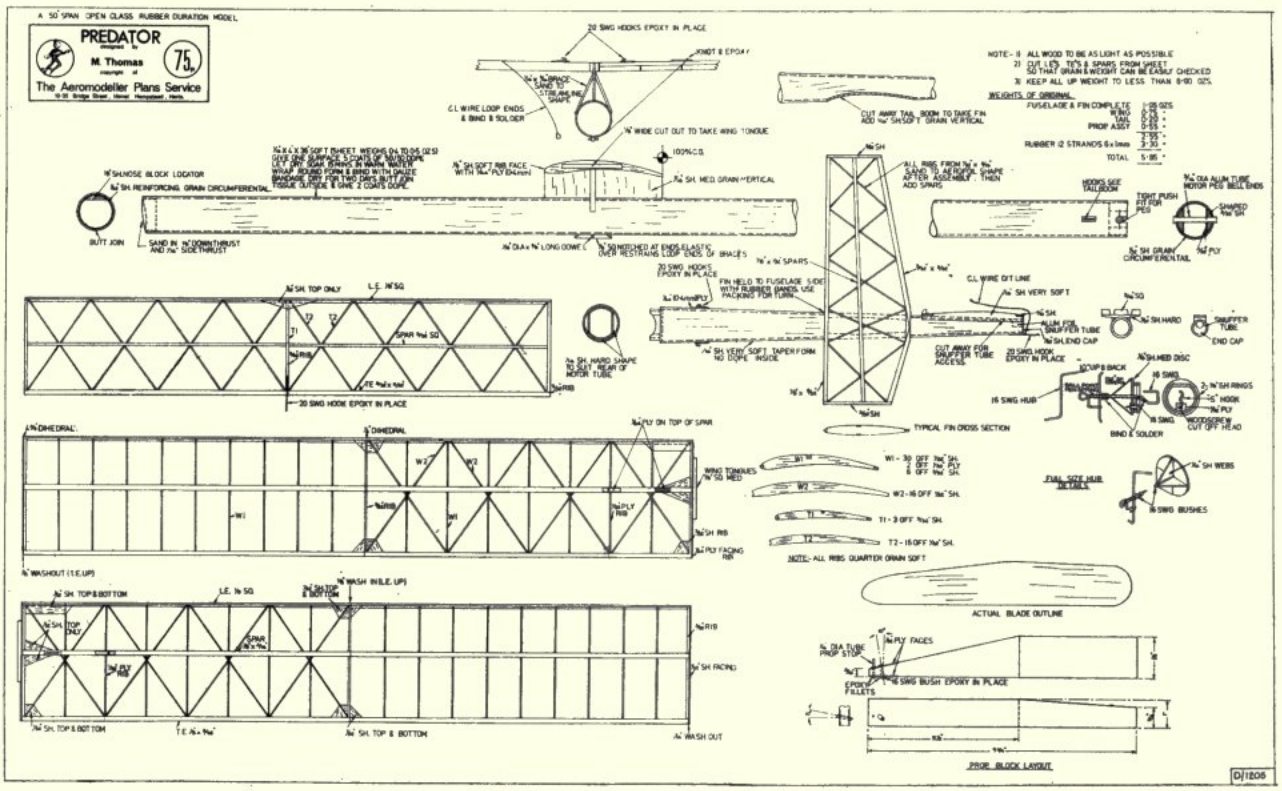
The outline of the fin is laid down, the 1/32 in. x ¼ in. ribs are glued in and the structure sanded to airfoil section before the side spars are inserted. Cover, give one coat of thin dope and spray fluorescent paint.

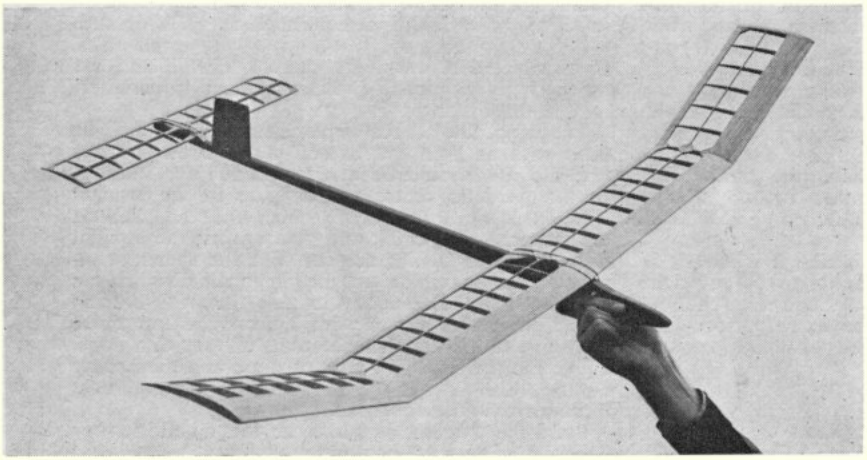
If you don't like the built-up nose block – make it 'solid' from laminated sheet. Take care with the wire bending and soldering and you will have a light, almost indestructible, shaft assembly. Note that there is no bearing – the nose brass tube merely bears on the hub tube.

The first three versions of the model used carved blades as per plan, but for the past 12 months I have

Continued on page 679

FULL-SIZE COPIES OF THIS 1/7th SCALE REPRODUCTION ARE AVAILABLE AS PLAN NO. D 1205, PRICE 75p (INCLUSIVE OF POSTAGE AND V.A.T.) FROM AEROMODELLER PLANS SERVICE, P.O. BOX 35, BRIDGE STREET, HEMEL HEMPSTEAD, HERTS HP1 1EE.





This month we detail the fuselage construction of the St. Leonards Model Supplies' 'Asteroid' A/1 glider

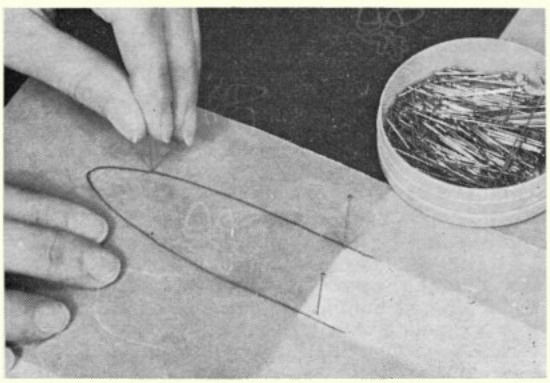
Back to....SQUARE ONE!

WITH THE construction of the 'flying surfaces' detailed in the last two issues, it is now time to consider the fuselage, which in this instance is a very simple, yet sturdy affair. Nonetheless, accuracy is still important here, as the fuselage's main duty is to hold the wing and tail apart and in the correct alignment to one another – so take care at all times.

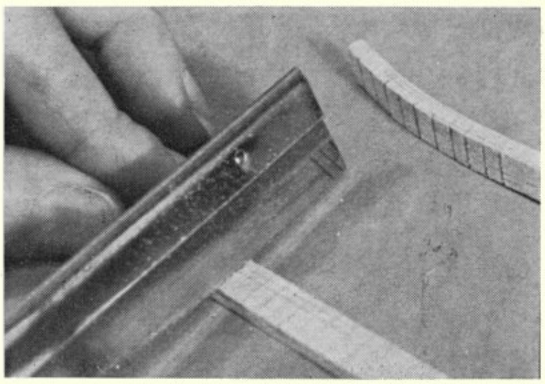
The kit in question does not contain full-length fuselage sides – they must be made up from two shorter pieces of sheet balsa, and then joined with a spliced joint. The instructions describe how to cut the wood to size and do this very carefully, if your measurements are not accurate there will be a 'step' between the front and rear halves. Should you make a slight error, do not worry, join the halves as described and then using a long straightedge, trim off the step, but remember that this will make the fuselage fractionally narrow.

However, assuming that your cutting out is accurate, cut the fuselage sides at the angle shown to form the splice – this form of joint is very common in modelling as it presents a much larger gluing surface than merely butt joining sheets, and also spreads out the stress areas – which is important to avoid future breakage. Prove this to yourself with joints made on scrap balsa. When gluing the two sides together, there is an easier and neater method than simply gluing and pinning the wood to the building board. (See Fig. 1). Firstly, lay the wood on the board exactly in alignment, then place Sellotape over the joint and press down. Remove from the board, double back the wood using the tape as a hinge and apply a little PVA glue in the 'V' formed, then close up the joint and pin down to the board (Sellotape side down) while the glue dries. This results in a perfect, neat, joint and the wood will not stick to the table! Repeat

Transferring the shape of the nose on to the sheet balsa. The outline is first traced on to greaseproof paper or similar, and then laid over the balsa. Slip a sheet of carbon paper between, then use a pin to prick the shape through on to the wood. Finally just 'join the dots' with a pencil line and cut away the excess wood.



Making the strip balsa longerons conform to the shape of the nose section. Use a razor saw as shown, making a series of cuts most of the way through the material, then, holding between thumb and forefinger, gently bend to the correct curve. More cuts will be needed at the point of the sharpest curve.



for each fuselage side and the longerons. Note how the splices lay in opposite directions to one another – this is so as to spread the stress load caused by the joints, which will in fact be stronger than the surrounding balsa.

When dry, the rounded shape of the nose section must be transferred to the balsa. To do this, take a piece of transparent tracing paper (toilet paper will do in an emergency!) and trace out the pattern from the plan. Now lay this over one of the fuselage sides, and using a pin, prick the outline through onto the balsa – a tip here is to insert carbon paper between the tracing paper and the balsa so that the pin pricks show up as dark spots, much easier to see. Trim to shape with the balsa knife and sanding block.

This done, hold the shaped fuselage side over the unshaped one and carefully run around the outline with the balsa knife to produce an identical replica.

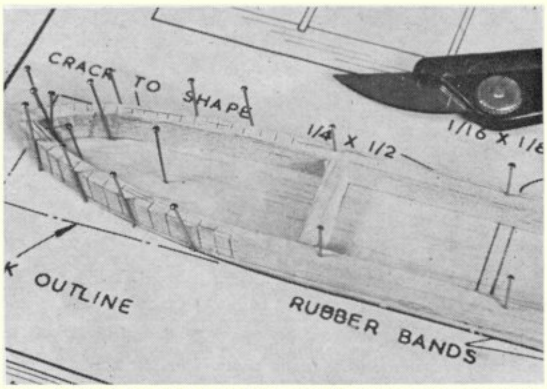
Now, take one of these sides and mark onto it the position of the various vertical spacers before pinning it in position over the plan – remembering to add the polythene sheeting first, of course.

The instructions state that the longerons should be cracked or steamed to the nose shape, but the wood in our kit was rather too hard to respond to the steam treatment (detailed when constructing the *Swan* glider) so we used a different method – saw cuts. To do this we simply took an *X-acto* razor saw (fitted to the *X-acto* No. 5 handle) and made a series of cuts across the width of the longeron, approximately $\frac{1}{8}$ in. apart at the point of maximum curvature (see photographs). Do not cut right through – just enough so that when held between thumb and forefinger, the desired amount of curvature could be made.

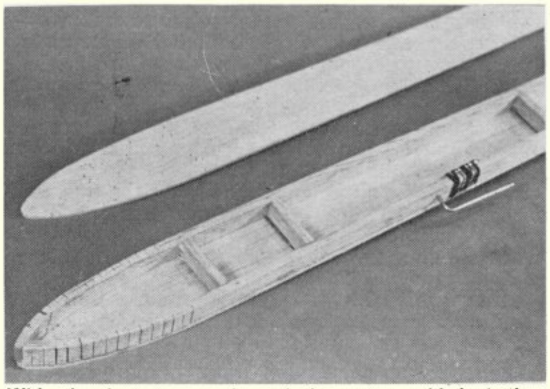
Do not forget the towhook! Bend it from the piano wire supplied, using a pair of long-nosed pliers, then bind it to the lower longeron, in the position shown, using strong thread. Glue securely.

Now, glue the longerons in position, using plenty of pins, and make sure that they are exactly vertical – the engineer's square comes in useful here again. Cut the vertical spacers from the same material as the longerons, and glue in place. Finally, remove all pins and add the remaining fuselage side – pin or weight in position while still on the building board to prevent a warp from developing.

The wing mount must now be shaped from the piece of $\frac{1}{4}$ x $\frac{1}{2}$ in. balsa – and a fairly good job must be made of this as it must match the undercamber of the wing section. How to achieve this? Well, take a piece of thin cardboard (we used a postcard), and use carbon paper to transfer the desired outline onto this. Cut out the shape of the upper section, then aligning the card with the piece of balsa, draw the outline onto each side – now it is just a question of carving and sanding down to the lines on either side. Not difficult provided you marked the lines out accurately. When satisfied,



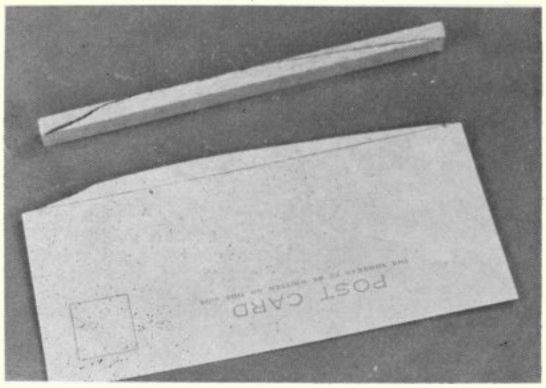
With the first fuselage side laid over the plans, the longerons are pinned in place – make sure they are vertical. Note pins holding the curved longerons: pin either side of the wood, not through it. Add vertical spacers at this stage.

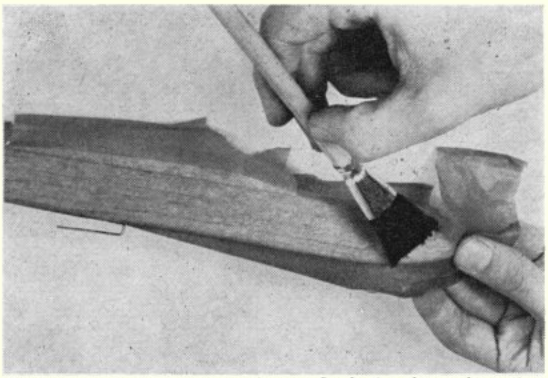


With the longerons and vertical spacers added, it just leaves the remaining side to be added. Leave the fuselage flat on the board and use weights or pins during this operation to prevent warps.

Making 'balsa putty' to fill the gaps caused by the saw cuts in the longerons. Just mix balsa cement and balsa dust and smear in place; then when the glue has set, it can be sanded down smooth.

Use a simple template, cut from a postcard, to mark the outline of the pylon on either side of the balsa. Do this carefully, then carve and sand down to the lines – the result should be parallel to the base.



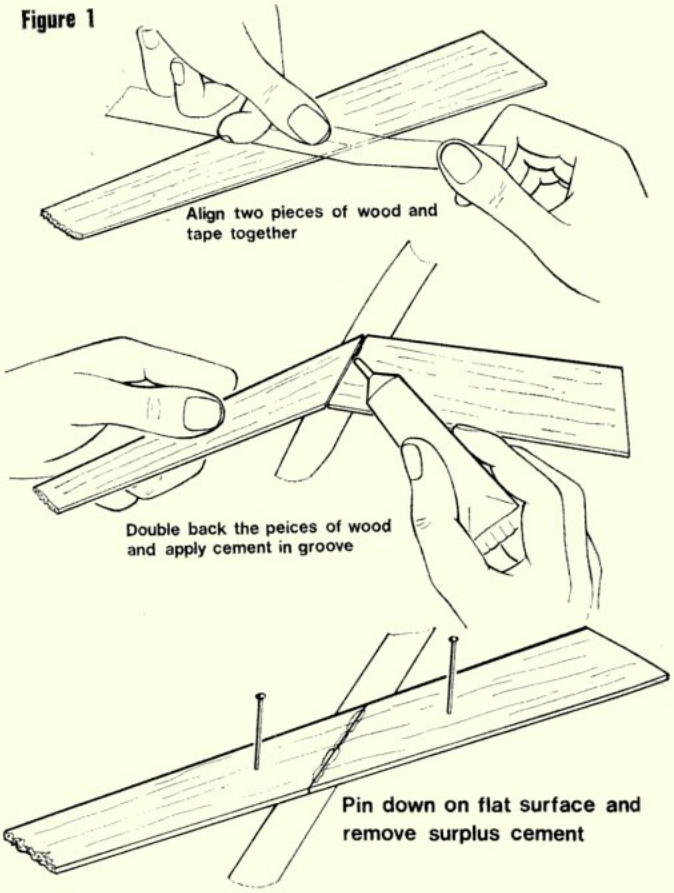


Doping on the lightweight tissue. Soak the tissue in water, then lay in place and apply dope – do not use tissue paste on this occasion. Nicking the tissue with a razor blade will help it around compound curves. Make sure that the tissue is free from wrinkles – smooth out carefully with your fingers.

glue in place before rounding off all the edges – except those of the wing mount itself. At the same time cut the fin from the $\frac{1}{8}$ in. sheet supplied, noting that the wood grain runs from top to bottom. Do not separate the rudder – just round off all the edges with fine glass-paper. Where the saw cuts were made in the longerons, gaps will be left showing, and these may be readily filled using 'balsa putty' – this is very easily made. Just take a soft piece of scrap balsa and sand down, saving the balsa dust. Now squeeze some balsa cement onto a piece of card and add the dust until a thick paste is formed – and smear this 'mess' over the saw cuts. It won't look very pretty at first, but when the glue has dried, sand it down smooth again and the gaps will have disappeared!

After sanding the whole fuselage smooth, now is the time to tissue cover it. This is really quite simple – just cut out a strip of tissue about 4 in. wide, soak thoroughly in water and lay in place. *Do not use tissue paste*. Gently pull the tissue so that no wrinkles are left and then whilst still wet, apply a coat of clear shrinking dope thinned 50 per cent with cellulose thinners. You will be able to cover at least two sides in one operation if you are careful – use a razor blade to nick the tissue when a tricky curve is encountered. If the tissue does not seem to stick too well, then brush on a quick lick of unthinned dope along an edge. Trim off with the razor blade before the dope has set, and smooth the edges down with

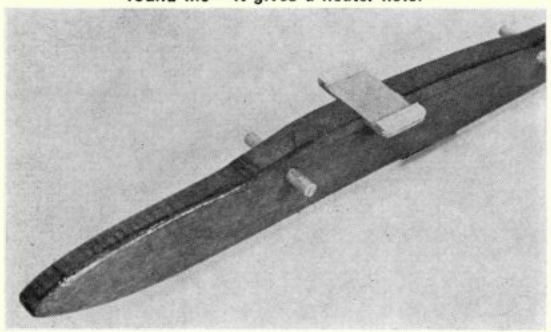
Figure 1



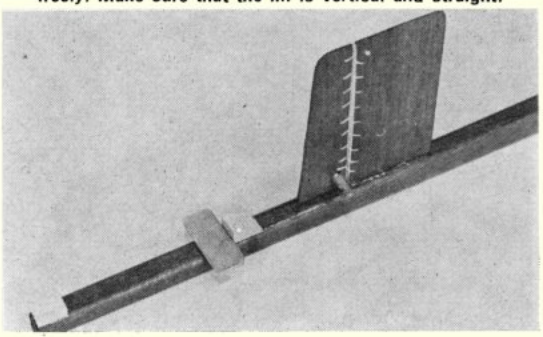
your finger. Let dry, then cover the remainder. It does not matter how many pieces of tissue you use for this operation, but remember that where coloured tissue overlaps there will be an obvious dark line, which tends to spoil the appearance. At the same time cover the fin – but pin down flat while the thinned dope dries to prevent warps. Apply three coats of the 50 per cent thinned dope to the fuselage and fin.

All that remains now is to add the accessories which are more conveniently glued in place after the covering stage. However, before the fin is added, separate the rudder portion and then stitch it to the fin so that it pivots freely. It will probably seem very 'sloppy'

The finished 'nose-end' – note how the ply wing mount is recessed flush with the pylon. When drilling holes for the dowels, make sure that they are at right-angles to the fuselage – crooked dowels look awful! Preferably, drill the holes $\frac{1}{8}$ in. diameter, then enlarge to 3/16 in. diameter with a round file – it gives a neater hole.



The tail end reveals the mount and stop for the tailplane, and the hinged fin/rudder. The hinge consists simply of stitching – apply balsa cement to the thread to waterproof it and to take up the 'slope' which normally results, but do not get any glue between the two items, they must swing freely. Make sure that the fin is vertical and straight.



and the two parts will move up and down relative to one-another, but a light smear of balsa cement over all the cotton thread stitches will cure this.

The ply wing mount must be recessed into the balsa pylon – do this first by using the balsa knife and finish off with a file to form a good fit – the top of the ply platform should be flush with the balsa platform. When gluing this in place, make sure that it is absolutely at right angles to the fuselage – check with the engineers square once more. Next, add the tailplane ply mount ensuring that it is parallel with the wing mount, and removing the tissue from the top of the fuselage where it is fitted in order to obtain a strong joint. This applies to all cases where parts are added to a pre-covered and doped component. You may find it easiest to 'scratch' the dope away with a razor blade, than to peel off the tissue.

Finally, it just remains to add wing dowels, the balsa tailplane stop, packing piece and the fin (not forgetting the ply horn through the rudder) – making sure that the fin is exactly vertical and straight. Balsa cement is perfectly suitable for all these joints, particularly as it adheres readily to doped surfaces which may not have been cleaned off thoroughly. When dry, apply a couple of coats of full-strength dope to these accessories in order to waterproof them. The fitting of a dethermaliser and auto-rudder system will be dealt with in a forthcoming issue.

To be continued

PREDATOR

Continued from page 675

At right, the simple lines are evident – rolled balsa fuselage is strong and will withstand most motor breakages. If it doesn't, well, at least it is easy to repair! Below, Mike launches for yet another max – it cannot fail, so he says, but does not offer a guarantee. . . . Make it light and it will give excellent results.

laminated the blades – two thicknesses of 1/16 in. softwood over a carved form and glued with P.V.A. glue. The system described by Ron Coleman in his recently published *Airscrews en Masse* series could be used to advantage if you want to try laminated blades. There is no difference in performance in the two methods, and because very soft wood was used for laminations, the weights of the two systems were identical. I soak the laminates in hot water, squeeze off excess water then place on a small amount of P.V.A. glue which thins out with the wetness, then bind and dry in the usual manner.

Leave gluing the pylon and pylon struts until the model is completed. After assembling the model, including the rubber motor, the pylon is glued in place with the centre of gravity as indicated.

Trimming is very easy: sand in the down and side thrust; check the C.G. is as shown, glide and pack tail up or down to suit. Glide turn is achieved by shimming the strapped-on fin. Vary the down and side thrust in conjunction with the fin shimming to get power and glide circles both to the right. Try to keep the weight down and you will end up with a great long 12 strand motor which on the original gives at least a 2½ minute motor run – it is impossible not to max!

The overall weight should be kept below 6 oz. So if you build a heavy structure, you will have to reduce the rubber weight. This means you will get a faster climb than the original, but not quite the same height, and with a reduced motor run, of course.

The only reason that this is not a beginner's model, is the ultra light structure; with the use of medium hard wood (particularly in wing and tail L.E., T.E. and spars), there is no reason that it can't be built by a beginner – the rolled fuselage certainly makes for far easier handling by clumsy fingers!

FLYING SCALE COLUMN

Remember that fine summer we had? In case you had forgotten as you sit close to the fire, this is the view of the control-line site at the 'Aeromodeller' All-Scale Day, Old Warden last June, with Bob Ivan's Boeing Crewmaker in the foreground.

News, views and reviews of the latest in scale topics by ERIC COATES

I SUPPOSE that 99 per cent of youngsters are introduced to aeromodelling with the purchase of a small 'flying scale' kit (I don't include in my definition of aeromodelling here the assembly of plastic non-flying models) and in the U.K. for the past 20 years this has inevitably meant a selection from the ranges of either Messrs. **Keil** or **Veron.** This is a pity as the chances of the average lad of 10 or 11 making one of these models, let alone making it fly satisfactorily, must be very low indeed. This is no slur upon the products of the manufacturers which offer very good value as when built by an experienced modeller, with a few modifications, most of the models can be made to fly very well indeed.

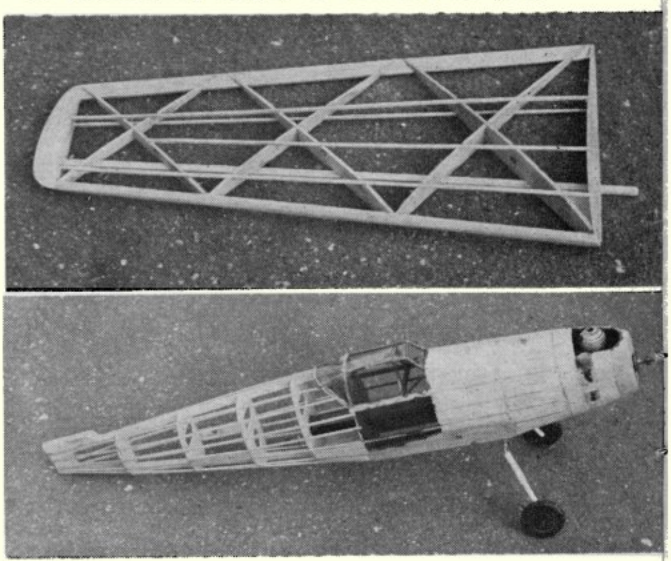
A good model shop proprietor might try to persuade our young would-be modeller to build a far simpler aeroplane: of the duration type. Such a model, with its much less complex construction and high degree of stability gives the youngsters a fair chance of success which may 'hook' him on to aeromodelling. A bit of success early on can keep the interest sufficiently to weather a few failures later, whereas a first failure, with the scale model, probably means the youngster is disheartened and returns to plastics, or stamp collecting!

Yet model shop proprietors have told me it is almost impossible to persuade youngsters to buy simple duration kits in preference to a scale model. They say that they do not want a funny looking thing like that, they want a *Spitfire* or a *Focke-Wulf* – no doubt having been inspired by seeing these redoubtable machines performing in some war documentary on the 'box'.

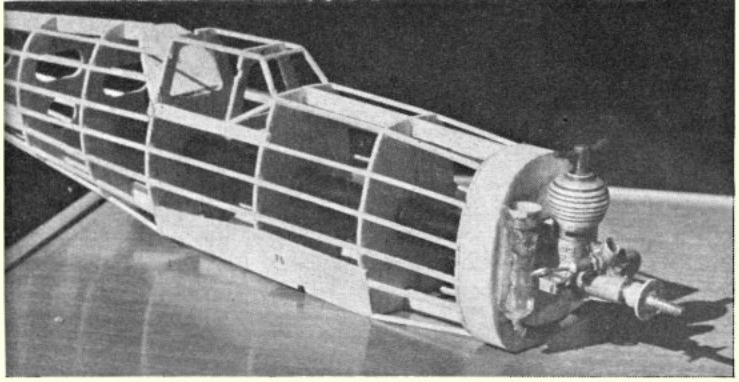
What is the solution then? Until someone invents a ready-to-fly ultra lightweight, plastic machine I don't think there is one. Many years ago **Frog** marketed a semi-scale rubber-powered *Spitfire* made from moulded paper but this had a limited performance and was relatively expensive in its day. A more successful semi-scale fighter – the *Interceptor* faired somewhat better; offering a good performance but again was expensive. In more recent times **Cox, Testor** and **Keil** have offered moulded plastic control-line versions of various fighters powered by small glow plug engines but with limited performance. They also cost quite an amount of a young lad's pocket money. Most, I suspect, are bought as Christmas and birthday presents.

With this problem in mind, it was with interest that I received via the British importers, **A. A. Hales,** the new range of rubber powered flying scale kits, from that venerable American manufacturer – **Comet,** for review. In a commercial world, geared for the wants of the young, whether it is good for them or not, it was inevitable that W.W. II fighters should predominate the range. Out of six models sent for review no less than five are of this category: *Spitfire, Messerschmitt Me 109E, Focke-Wulf 190A, P51D 'Mustang'* and *Mitsubishi A6M* – the odd man out, and obviously the best flying choice being the *Piper J3 Cub.* As with most American presentations, the kit box is a riot of colour – each depicting the subject of its contents in victorious combat against a contemporary adversary! This must do wonders for sales promotion but must be a tremendous let-down for a young purchaser when he realises that the tissue-covered stringered machine he is expected to construct will bear little resemblance to the metal-clad fighter depicted on the box lid. . . .

As aeromodelling designs, the structures are quite



Above, wing construction on the Comet Messerschmitt 109e is typical of their entire range of scale kits – strong, but looks wrong on aircraft which had prominent 'fore and aft' ribs. Below, fuselage of the Me 109e before covering.



Our columnist converted the Me 109e to diesel power instead of rubber by sawing off the nose end and adding a ply-faced former in order to radial-mount the Frog 50 – seen here with the clear 'eye dropper' style tank epoxied next to it. The 'motor tube' described in the text is just visible here.

novel – all featuring cardboard motor tubes and geodetic wing construction. This latter I find quite acceptable for the fighters which had metal clad wings and therefore the stringer-covered geodetics probably looks better, under painted tissues, than conventional chordwise ribs with their attendant tissue sag. The same structure however is used for the *Piper Club;* which of course had chordwise ribs and covering sag on the real thing. Needless to say this looks most odd on the finished model.

All parts are die cut from rather hard quality balsa, which makes for easier handling by the younger builder but naturally cuts down on performance. The accuracy of the die cutting unfortunately leaves a lot to be desired, particularly with the alignment of the stringer slots which, unless modified, produce a very wavy stringer line along the fuselage. A reasonable plastic propeller is included but the nose button and wheels provided are of hardwood and rather heavy. The rubber supplied is of good quality but insufficient in quantity. The models vary in span between 22 and 26 in. and retail in the U.K. at £1.50, which is more than the price of their competitors, but one must bear in mind that they produce a larger model and that the parts are die-cut. Nevertheless at this price I think a moulded cockpit canopy and transfers could have been provided rather than the sheet of celluloid and printed paper decals.

Well how do they go together? I am grateful to D. Clarkson and T. Manley of the Blackburn A/C club who built the *A6M* and *Spitfire*, respectively, for this review and the young Hudson brothers: Mark, aged 14, who built the *Cub* and Alex, aged 12, who built the *P51D*. I had a go at the *Me 109E* and will describe the assembly, which is typical, in some detail.

Fuselage construction is relatively simple using the motor tube to line up the formers at the nose end. It is a considerable weight penalty, though and could have been dispensed with if normal crutch construction had been followed. It does promote rapid building which I suppose is what is wanted by the younger constructor. The wings are also very quickly constructed, the geodetics producing a very torsionally-stiff structure to resist warps when the covering shrinks.

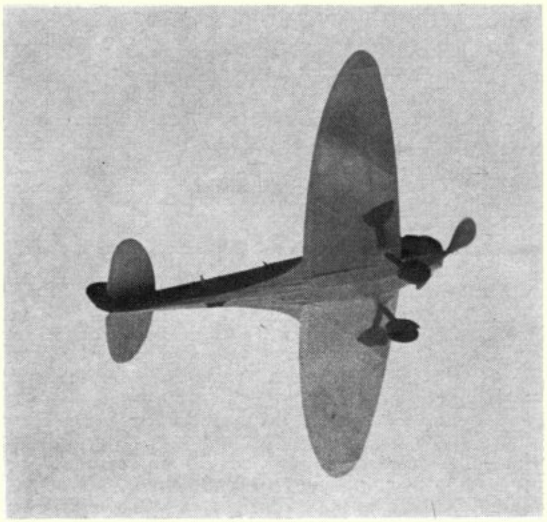
Having rapidly got this far I was aware that the model was becoming rather heavy for much hope of any real performance with rubber power. The plan shows a conversion to a Cox .010 cu. in. engine and I would recommend anyone hoping to have any prolonged flying with these models to seriously consider such a conversion – I have seen people fly models very successfully with this unit. Not wishing to purchase one specially, I rummaged through my engine collection to see if there was anything suitable. I did briefly consider my brand new Brown Junior CO_2 motor but decided that it needed something better in the way of a model and in any case the model would probably be too big and heavy for it. This was later confirmed by John Stennard who tried one in the *A6M* and reported a failure.

My next thoughts, naturally, turned to fitting one of my Mills 75's but alas this really was too big. I then gave serious consideration to fitting an *ED. 46* which must have last been airborne 20 years ago in a *Miles Hawk*! It could just have been squeezed in, but would have stuck out a bit. The beam mounting also would have been troublesome. A better bet would have been a D-C Dart (still in production). The final choice fell on a rather worn Frog 50: of mid 50s vintage. A rapid check showed this engine could be buried almost completely, within the confines of the Me 109E fuselage, in an upright position, with only the rather large compression adjusting screw protruding.

I therefore sawed through the stringers and motor tube immediately in front of former 'B' and glued a $\frac{1}{8}$ in. sheet former to the front of 'B' faced with 2 mm. ply, to form a radial engine mount. The ply facing was angled to give about 3° right side thrust – I guessed that with the thrust line acting just about through or, if anything, a bit above the centre of drag no downthrust would be necessary. I built up the nose contour around the engine with scrap block and sheeted-in between the stringers back to the cockpit with $\frac{1}{16}$ in. balsa. The fuselage cross section on top of the fuselage, in front of the cockpit was corrected with 3/32 in. sheet as for some unaccountable reason this builds up to a flat-topped section here if one follows the plan and cut out formers – a mistake perpetuated also on the kit box illustration. The only other modification I made to the structure was the substitution of soft block wing tips to give a better shape when carved than the built-up tissue-covered ones would. I did not fabricate the various radiators and air intakes from the printed card as the drawing showed, but preferred to carve more accurate shapes from very soft $\frac{1}{4}$ in. balsa sheet.

The hardwood wheels supplied in the kit are almost the perfect form for the '*109*', though it must be said that the same wheels are supplied in *all* the other kits where they are not quite so suitable; particularly the balloon-tyred *Cub*! I decided to make a detachable undercarriage so that I could fly the model without it

The Messerschmitt as she was test-flown; covered but not painted, just to make sure all was well. A wise precaution as it happened.



Terry Manley built the Comet Spitfire kit, finishing it as a rubber-powered model – looks good in the air too, although flight performance was affected by being rather overweight.

if I wished – W.W.II fighters never look right to me flying with their wheels down. They can be tolerated in small rubber models, usually flown indoors, because they are never far from the ground and are more or less permanently 'on the approach'. An undercarriage however, does lower the C.G. and impart a crude form of pendulum for lateral stability and on a low wing machine this can make all the difference between flying and pranging.

The two undercarriage legs were held together with a 20 swg spreader just under the wing. Two vertical prongs located in 20 swg brass tubes, epoxied to balsa blocks within the fuselage while dummy oleos were formed by wrapping paper around the 20 swg legs. Balsa U/C fairings were then glued to the leg and for greater realism the tread pattern was simulated by sawcuts, made with a Junior hacksaw in the wooden tyres.

I covered the whole machine in lightweight Modelspan doped on, and then applied three coats of 50 per cent thinned dope to shrink it. The tissue supplied in the kit is quite suitable but after over 20 years of experience with Modelspan I preferred to apply what I am used to, for what was quite a tricky covering job.

One shortcoming of the geodetic wing structure showed up after the dope had shrunk. The leading edge pulled in slightly between the large gaps where the ribs join – half ribs parallel to the chord running from the intersections to the leading edge would cure this fault. A well worth-while modification I would say. Alternatively on a powered version, such as this, leading edge sheeting would have been a distinct improvement both strength and appearance wise.

Following my usual fashion, I commenced trimming the model in its stark white covering – I do not believe in finishing a scale model until it is trimmed and on this occasion I certainly saved myself what would have been a lot of wasted effort!

With the U/C removed, glide tests seemed quite promising – fast and flat, but dead straight. I even had to put Plasticine in the tail which could be removed as the C.G. moved aft when painted.

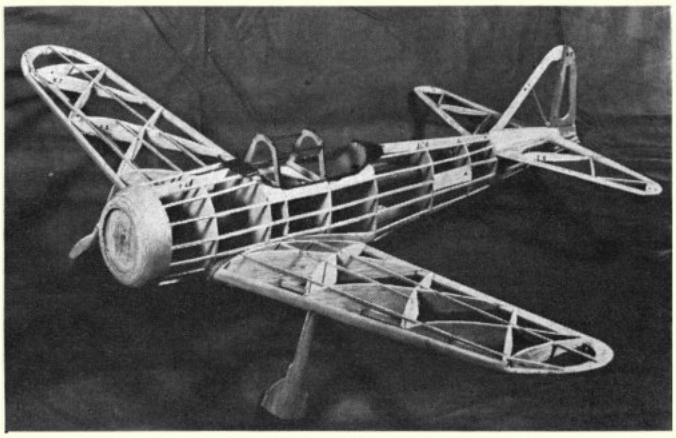
First low-powered flights, extending the glide, also looked promising but then disaster struck. With a little more power she turned to the left, dug a wing into the floor and did a high speed cartwheel which revealed a major weak spot of the design. The fuselage broke in two immediately aft of the point where the 'motor tube' terminates. With a multi-stringered fuselage job such as this a repair is practically impossible . . . so at that point my interest in the '*109*' ceased. If it won't fly it is useless, is my attitude to model aircraft!

In retrospect I think the Me 109 *can* be made to fly as a power model, but if anyone is considering it I would recommend the following modifications: As well as the nose sheeting, make another longer 'motor tube' and continue it aft to the fin – a rolled 1/32 in. sheet balsa tube would be stronger and much lighter. Make the wings 'knock-offable' using tongues and boxes. Sheet leading edges and increase the dihedral to about 7°. I think my thrust lines were about right.

How did the others fare with their specimens? All built them up as standard rubber powered jobs.

Terry Manley found the *Spitfire* went together very easily – the geodetic structure being very good for the eliptical wings, although the fuselage was very inaccurate, especially at the nose end. Flight performance was mediocre due to the fact it was much too heavy.

David Clarkson found similar faults in the *A6M* kit, but enjoyed the novel form of construction. He



Above right, the Comet Mitsubishi A6M as built by David Clarkson – it went together well, but the scale accuracy was not too good. It should be quite suitable for conversion to power flying with suitable strengthening. At right: the Comet Mustang P51 made by 12-year-old Alex Hudson – and a very fine job he made of it too. Total weight when ballasted correctly was 3 oz.

Impressive one-eighth scale 60 in. span Hawker Hunter built by Anthony Nelson of the North Norfolk Club for control-line operation. The Merco 61 is mounted as a sidewinder in the nose – remove the prop and it looks really true-to-life. It took Mr. Nelson some 400 hours to construct this beauty!

considers it would have made a much better power model with suitable strengthening.

I was particularly interested in how the Hudson brothers got on; being of the age group for which the kits are intended. Alex made a particularly fine job of the *P51* although his father assisted in the covering; which is the most difficult job of all. This built up to what is probably the most accurate of the sextet, the major criticism being the cockpit canopy. To expect anyone to produce a bubble canopy from a sheet of celluloid by cutting to a paper pattern is just not on. When ballasted to the correct C.G. position, the weight exceeded 3 oz. and so needless to say flight performance left something to be desired.

Mark, who built the *Cub* found it very easy to construct but found the motor tube and geodetic wings totally alien to the design and felt that the lack of a proper noseblock assembly to be a big disadvantage. It was impossible to insert sufficient rubber down the tube via the nose button.

To sum up then. An interesting series of designs from a constructional angle and all can provide beginners with a useful building exercise. As rubber powered flying scale models they leave a lot to be desired; beginners are still advised to build a duration kit first.

* * *

Also from the other side of the Atlantic, something I can really recommend. A series of reprints of drawings for the finest rubber-powered scale models of the 1930s – the period when rubber power was the absolute 'King'. Aptly named **Golden Age Reproductions,** of Braintree, Mass., offer a range of plans of the best of what was available in that era, in their illustrated catalogue. I have received three samples to date: reprints of the *Hawker Hind* and the *Fokker DR1* by **Peerless** and the *Bristol Fighter* from **Popular Aviation** of Jan. 1935. The *Hind* really is a gem. Extremely accurate and almost rib for rib simulated structure this should build up into a really fine stable flyer. Perfect for indoor meetings at Cardington and with a scale of $\frac{1}{2}$ in. to the foot, gives around an 18 in. wing span.

The *DR1 Triplane* is just as accurate but I would not recommend its prospective flying abilities compared with the *Hind*. At $\frac{3}{4}$ in. to the foot scale, a similar sized model results. The *Bristol Fighter* has a somewhat less accurate structure but the outline is just about right. At 1/24th scale this model has a 19 in. span, and a very good flight performance should result from this one.

Let me emphasise that these are by no means beginners' models but require a very high standard of competence and an ability to build light – for instance all of them include separate built-up ailerons in the wings.

The drawings themselves are works of art. I gazed fascinated for hours at the *Hind*. Amazed at the amount of detail packed onto one sheet. At $1.25 each drawing they are not cheap but if you want a good drawing of a particular model, well worth it – see classifieds.

* * *

After the glorious summer weather this year the autumn has been rather a disappointment as instead of calm misty days we have had rather a lot of wind. Perhaps the worst day of all was September 30th; the day scheduled for the *All Scale Meeting* at Little Rissington. The meeting was well supported at least by prospective F/F and C/L flyers, the majority of R/C flyers preferring the alternate competition at Stafford. However, not a model took to the air. With winds in the order of 30 knots there did not seem much point in removing models from their parent cars!

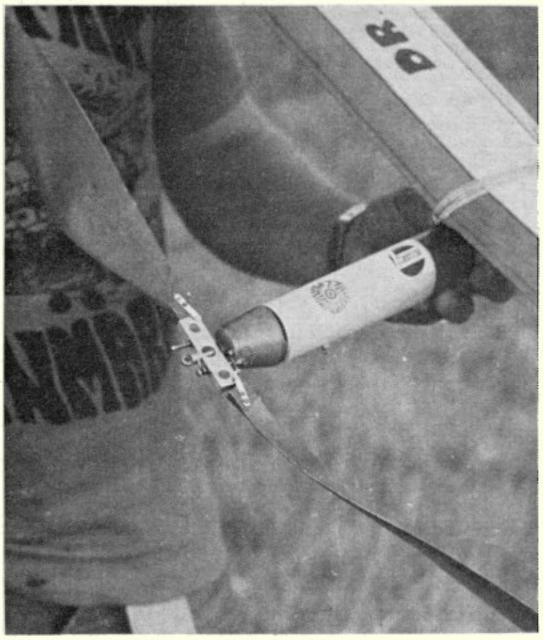
A fortnight later the **Scale Team Trials** were held at the same venue. Although the winds on this occasion were a reasonable 7-10 knots the temperature was at the 'brass monkey' level making the proceedings a real trial for competitors and judges (of whom

Continued on page 691

Another general view of the Old Warden scale meet – this time the R/C area with Dennis Bryant's Typhoon and Lysander in the foreground – two prototypes which have rarely before been considered as suitable for R/C, yet Dennis has proved the pessimists wrong – they fly a treat!

Ron Coleman concludes his view on the 1973 World F/F Champs with a report on the latest

WAKEFIELD DEVELOPMENTS



Klaus Wetterberg of Denmark used this neatly-made folding prop with Montreal stop assembly on his model named 'Dr. Hook', and which utilised interesting random-rib internal rib construction.

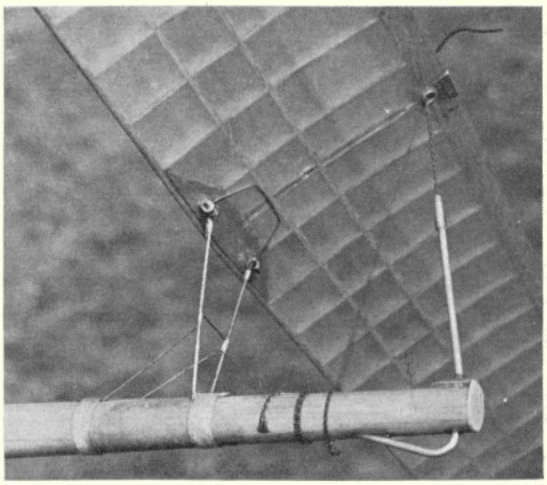
THERE IS this vision. Across my front there parades a Dane, a Dutchman, a German and a Frenchman, all holding tall poles from the tops of which emanate, in short bursts, long streams of bubbles. Another man carries a mylar-strip pole solemnly on his way, while in the middle distance, a vigorous group of bare-backed shirt-waving Americans go charging round in circles beneath a gliding model, crying *'Up baby, up!'* Meanwhile, all about, men of all nations talk into little black boxes, while others go roaring away into the blue, sunny distance on motorcycles. Just for a moment, at the pretence of not knowing what it is all about, I laugh with enjoyment: it does seem just a little odd!

Thus it was in the midst of Wakefield day. The Koreans were making their presence felt; they looked a picture of efficiency at the weigh-in – their boxes of all gold-painted models looked the part, as they themselves did in their colourful green uniforms. Their models had some 20 per cent of spruce in their construction with airscrews carved from the same material. One of the most noticeable things was the ease with which they could pick the thermals having far less recourse to bubble machines and radio than most other teams. They did however possess a very neat bubble-blower. Could it be that the orientals, living in a climate of thermals, grow up with an in-born talent in this direction? The solitary Japanese Kobori displayed similar abilities and brought his unsophisticated machine to third place right behind Kim Dong Sik.

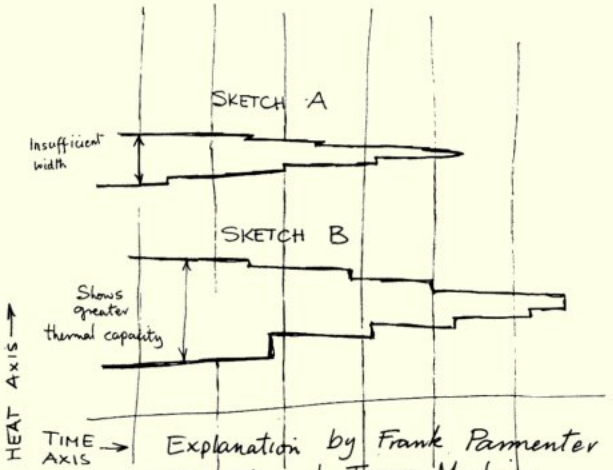
The Americans had some very efficient-looking thermal hunting gear on hand, and along with their inter-coms gave the impression that it was all wrapped up. But Frank Parmenter, in kindly explaining one instrument, assured me it was anything but. The revolving drum with its ink trace gives a continuous reading of developing thermals but interpretation of the trace is the thing – a quick thermal with little substance as drawn in sketch A needs to be discerned from one which goes up in steps, more widely spaced, with good capacity, as in sketch B.

A most interesting Wakefield model was 'Hesitator' the aptly-named delayed prop released job by Canadian Mike Thomas – missing the lift in the fourth round cost him a place in the fly-off. There seemed a slight lack of 'pull' on the climb, as if the rubber was below par, but when he has full power this will be a considerable model. Mike starts his launch with a cricket-bowler type run-up and a tremendous rocket-like thrust shoves the model about 30 ft. up when, 'click', out come the blades and up she goes. Considering the mystery which has surrounded this type of model the friendly way in which Mike showed all the details of his beautifully engineered machine was delightful while the professional set up with his models which all fold-away, two-piece, in a neat carrying case is impressive. Mike was in the last three Canadian teams and flew A/2 for England away back in 1951, while of course plans for his gadget free Open Rubber model 'Predator' will be found elsewhere in this issue.

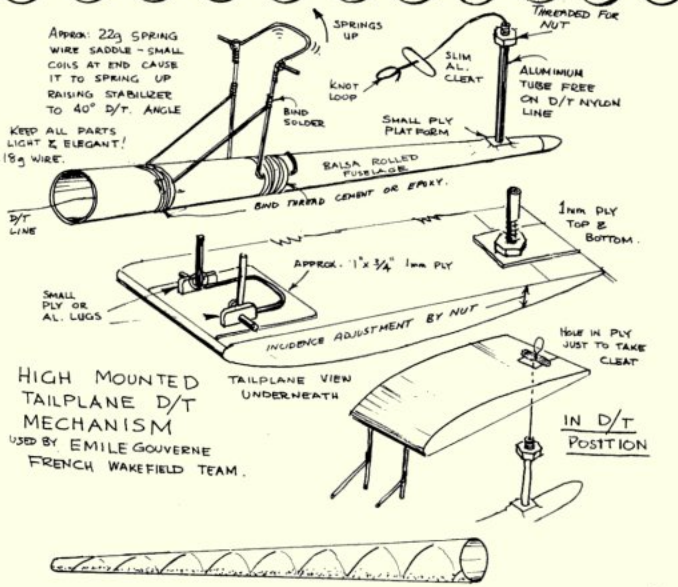
When a 'different' model appears, it stands out from the run of similar-looking Wakefields. The skilful handling of the model by Bruno Murari of Italy caught attention as he prepared it for flight – he winds up from the rear end of the motor tube and then clips on the tail section. The wing is mounted just atop the fuselage, very close to the thrust line. Housing for timer is a streamlined pod at the side with no VIT or auto rudder complications. He lost



Emile Gouverne of France mounted his Wakefield's tailplane atop this unusual spring wire saddle (seen here in the D/T position) – as sketched opposite.



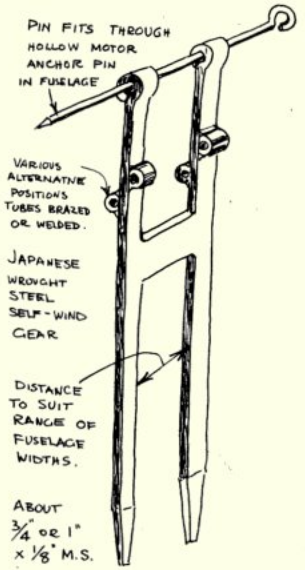
Explanation by Frank Parmenter of USA Thermal Trace Machine.



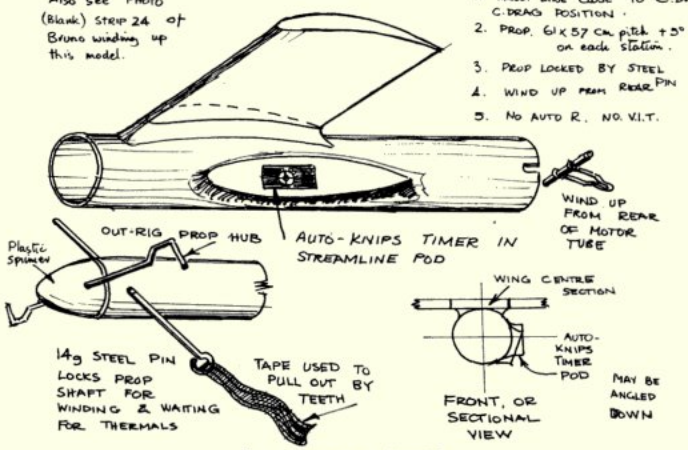
HIGH MOUNTED TAILPLANE D/T MECHANISM
USED BY EMILE GOUVERNE FRENCH WAKEFIELD TEAM.

TAILPLANE VIEW UNDERNEATH

Sketch by Ron Coleman



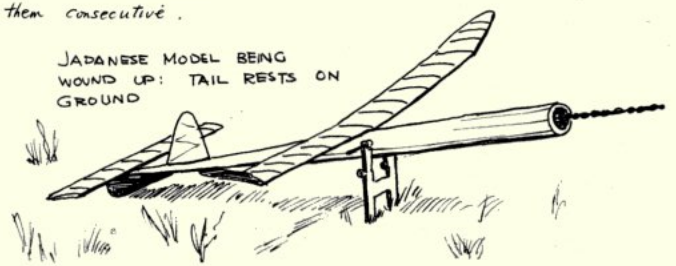
NEAR-THRUST-LINE WING ARRANGEMENT USED BY BRUNO MURARI, ITALY. WAKEFIELD CLASS.
Also see PHOTO (Blank) STRIP 24 of Bruno winding up this model.

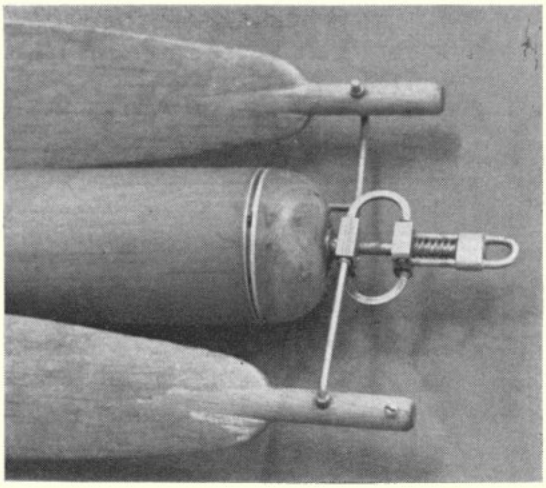


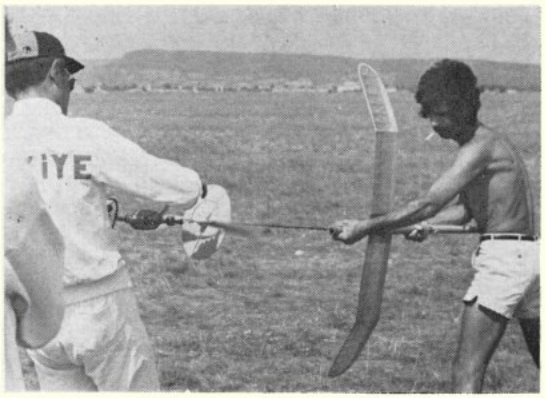
SIX CONSECUTIVE MAXES

OSMO KILPELÄINEN of FINLAND
USED A WAKEFIELD FUSELAGE WOUND IN VERY FINE GLASS MAT & RESIN IMPREGNATED ON A TAPERED FORMER. SLIGHT RIDGES AFTERWARDS SCRAPED & FLATTED DOWN. SEMI-TRANSPARENT VERY STRONG & LIGHT. He secured 5 maxes, 4 of them consecutive.

JAPANESE MODEL BEING WOUND UP: TAIL RESTS ON GROUND







At left, nose detail of Oschatz's Wakefield – very similar to his '69 winner. Above: Tagyar Akea of Turkey 'winds up' – note the use of the protection disc, also sketched opposite.

out in the first round but six consecutive maxes is no mean achievement. The out-rig prop was locked by a steel pin; the moment he sensed a thermal, Bruno whipped out the pin with his teeth and heaved the model skywards.

The use of resin bonded glass fibre for A/2 glider fuselages is well known and one tends to think of such fuselages as being ready-made 'off-the-peg' and, possibly, missing the opportunity of doing it oneself. The basis is a suitable former prepared with several coats of hard varnish and a coat of release agent. Wind on a single strip of finishing grade glass mat, slightly overlapping the edges. Dub in a coat of polyester resin and roll down with a narrow matting roller. Leave to set and before removing from the former, scrape and flat-down the slight bumps caused by overlaps. Osmo Kilpelainen of Finland has a Wakefield with such a fuselage – it is light in weight and appearance, and seemed to glow with its semi-transparent quality!

Ron Pollard has some finely finished props on his Wakefields made from soft balsa which has the necessary strength and hardness added by coats of polyester resin. This seems an ideal method as the soft balsa is light and easy to carve and smooth off. After considerable rubbing-down between coats, cellulose or enamel paints give a polished car-body type of finish.

The constructional detail of the delightful Wakefield by Emile Gouverne was pleasant to behold. An unusual high-mounted tailplane has a very efficient dethermalising spring saddle. This is an alternative to the usual rubber band and has the advantage of never needing replacement – the incidence angle is adjusted by a small nut. Some of the neatest and strongest folding airscrew hinges were on Emile's model. The blades can easily be changed.

Reuven Brand of the Israel team has a nifty method of attaching the wing pylon to a tubular aluminium fuselage. The pylon is made a snug fit and held down by rubber bands. Well, what's so special . . . ? Simply that it has a piece of paper masking tape neatly stuck along each side of the pylon which locks it solidly to the tube fuselage. No slide on landing! Thus, CG position is positively interchangeable and makes an ideal set-up when working out various systems on a new design.

The standard of craftsmanship displayed on all sides at such a meeting as the World Championships has to be seen to be fully appreciated. One expects to see the best: I had hoped to see more out-of-the-ordinary styles and methods of construction, so it was a delight to discover the beautifully curved dihedral wing by Alfred Mabille of Belgium. He explained how the spars including TE were first laminated by pinning out on a building board whilst the glue dries. Ribs are threaded on to the spars.

Turbulators were to be seen on many models particularly Wakefields and gliders. There was either the usual glued-on thread or a serrated edge to the top covering of 1/32 in. balsa. Gliders often had a stout nylon line mounted on brackets about every 20 cm, as much as a centimetre forward of the leading edge.

Shudi Suda, Japanese team manager, beamed with pleasure. 'No gadgets – no VIT . . . just plain model!' he said, showing off the plain looking Wakefield flown by Mitsuo Kobori. It did, of course, have a fuse operated D/T but it was beautifully simple and uncluttered. Mitsuo took it to third place, no doubt with the aid of that remarkable oriental thermal detecting ability being displayed again and again in these Championships. Mitsuo was the sole Wakefield member and it makes one wonder at the possible results if there had been a full team.

How simple to use their own 'Moon Tiger' mosquito coil to smoulder away; ever ready to light fuses! How simple and uncluttered their wrought steel self-winding gear just spiked into the ground!

There were not so many winding tubes in use but a number of motor breakages and some 'thwacked' fingers as a result. The Turks and the Russians were using a very effective airscrew and finger protection disc. Made of plywood, about $\frac{1}{8}$ in. thick, with a 2 in. margin of $\frac{1}{4}$ in. foam plastic facing the 'screw', it fitted firmly behind the noseblock, and revolved with the prop during the winding operation.

Unconventional tailplane/fin layout on Reuven Brand's model – the very neat, practical, wing pylon mounting system is sketched at right.

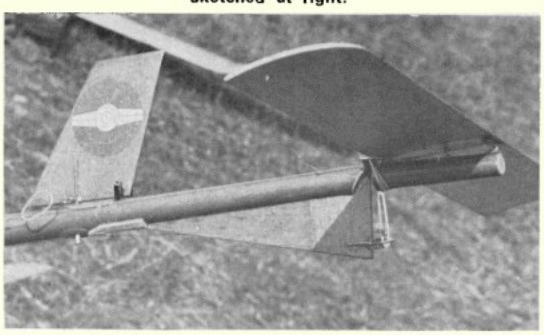
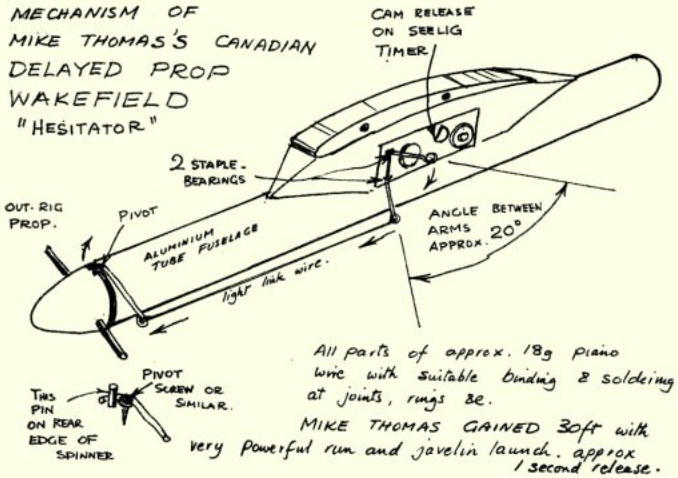


DIAGRAM OF RELEASE MECHANISM OF MIKE THOMAS'S CANADIAN DELAYED PROP WAKEFIELD "HESITATOR"

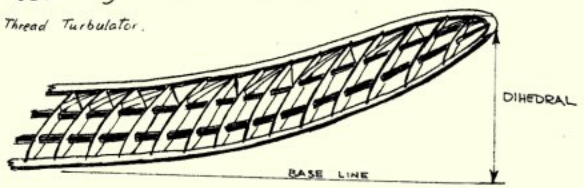


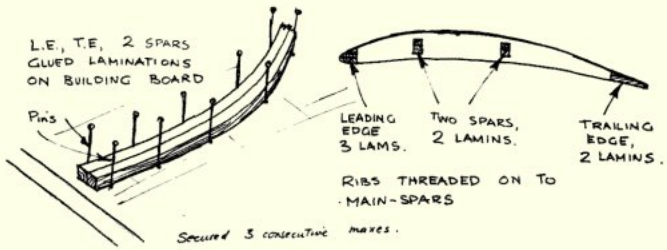
All parts of approx. 18g piano wire with suitable binding & soldering at joints, rings &c.

MIKE THOMAS GAINED 30ft with very powerful run and javelin launch. approx 1 second release.

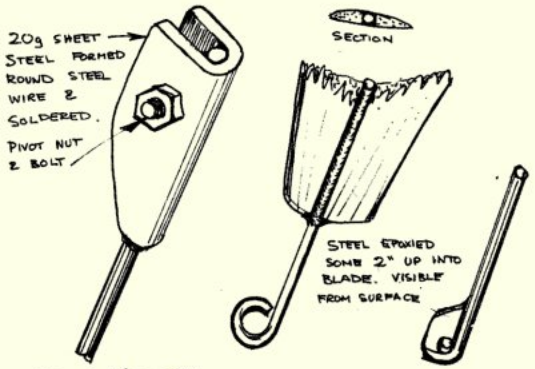
Sketch by Ron Coleman.

GRACEFUL CURVED DIHEDRAL WAKEFIELD used by ALFRED MABILLE, BELGIUM.

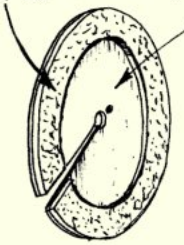




EMILE GOUVERNE (F) used this strong folding prop. hinge. Blades easily detachable. Wakefield.



FALING PROP.
FOAM PLASTIC 3/8", ABOUT 2" WIDE MAY BE AT CENTRE ALSO.

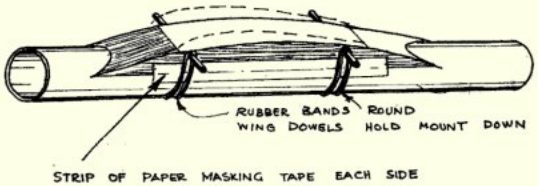


PLYWOOD DISC APPROX 12" DIA. 3-4 mm THICK.
CENTRE HOLES DRILLED & SLOT MADE TO BE A FIRM PUSH-FIT ON BACK OF NOSE BLOCK WHILST WINDING UP MOTOR.

PROP, NOSEBLOCK & DISC REVOLVE ON WINDING. IF MOTOR BREAKS PROP AND WINDER BOTH PROTECTED FROM RUBBER-LASH!

PROP-WINDER PROTECTION-DISC 'SEEN IN USE BY TURKEY AND U.S.S.R. TEAMS.

BUILT-UP FRAME/SHEET BALSA WING MOUNT SNUG FIT TO ALUMINIUM TUBE FUSELAGE EASILY ADJUSTED TO NEW CG POSITION BUT VERY SECURE DUE TO MASKING TAPE

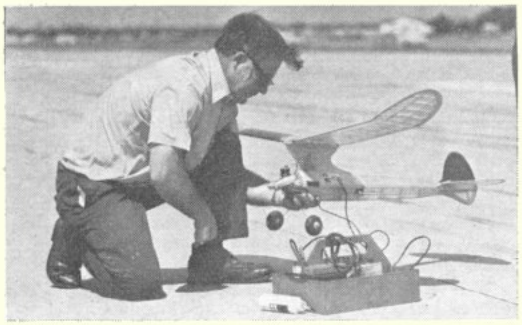


WAKEFIELD
WING-MOUNTING
BY REUVEN BRAND.

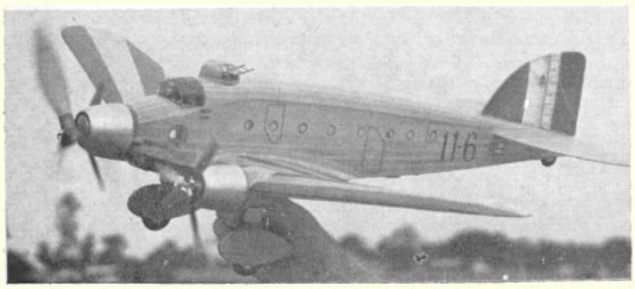
Left: How's that for attention to detail? Henry Szostek's moustache has the same amount of dihedral as his F/F Jodel D9 – pity his enthusiasm did not extend to the cockpit though. Above: William Wargo's beautifully stencilled and painted free-flight Lockheed Vega 'Winnie Mae' – was let down by the 1.5 c.c. glow engine which refused to run properly, preventing him from placing in the contest.

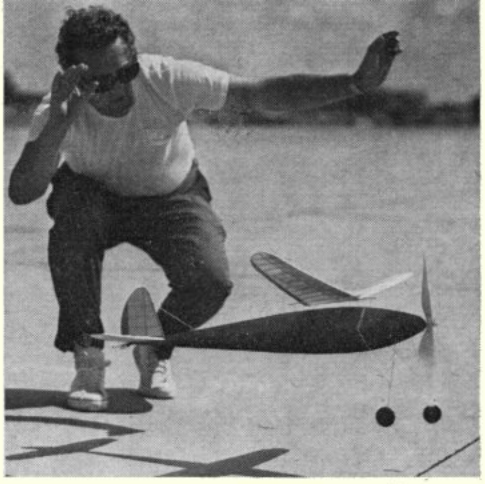
SCALE AND
U.S. NATIONAL
as seen through t

Above: nose detail of Ernest Violett's C/L Boeing Kaydet, built to $\frac{1}{8}$th scale – wish we could see more of this really impressive machine! Left: Woody Bartelt fires up his spark ignition K&B 29 in his vintage 'Alert' while below is Richard Bruning's rubber-scale Savoia Marchetti SM 81, weighing 2$\frac{1}{2}$ oz. Placed third.

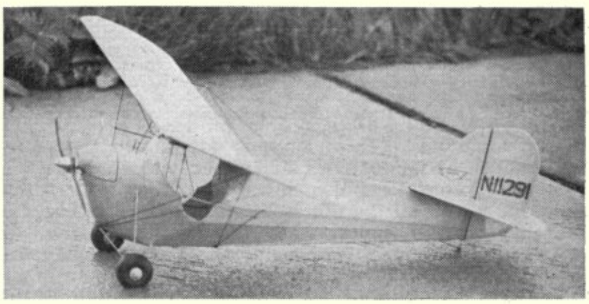


Above: Jim Watson must have shares in Pirelli – his massive rubber scale Focke Wulfe 47D spans 52 in.! Must have a stock of good quality balsa too as it weighs just 6$\frac{1}{2}$ oz. Below: Charles Schlobloher re-motors his rubber scale entry – a 1/12th scale Beech stagger-wing based on Aero Modeller drawings.

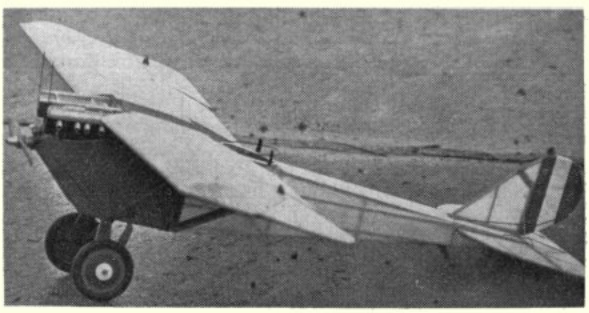


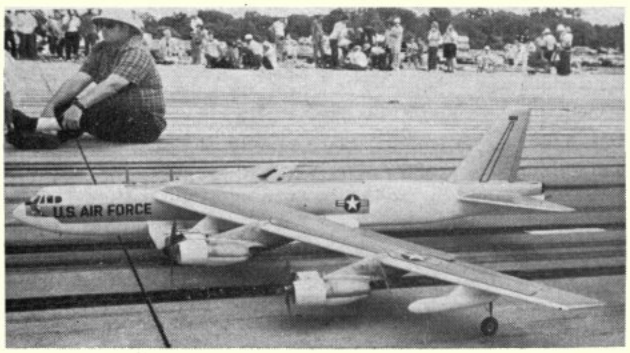


Above: superbly 'weathered' appearance on Florian Piorkowski's 53 in. span control-line Texan T-6, powered by an Enya 60. Unfortunately, this machine is no more – it fell victim to the strong wind during a contest flight. Above right: vintage models have a strong following – here Bashaw releases his 1937 Contestant rubber model. At right: neat little ($\frac{3}{4}$ in. = 1 ft.) version of the Aeronca Champ has Cox Pee Wee .020 cu. in. for power.



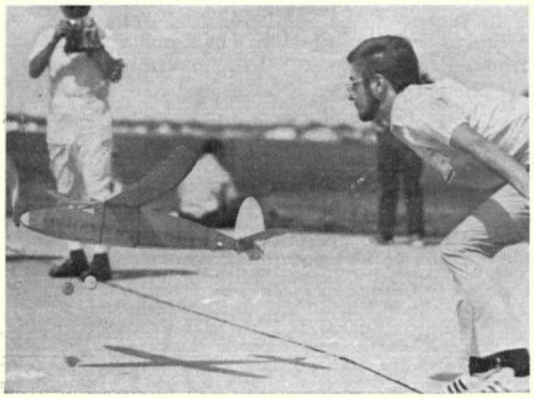
ND VINTAGE AT THE
ALS, OSHKOSH, WISC.
gh the lens of Dick Stouffer

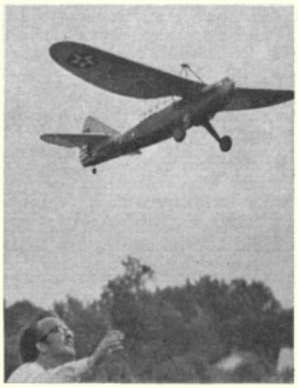




Above: some like 'em big! M/Sgt. Gordon Ford built this massive 19 lb. control-line Boeing B-52H which is powered by four McCoy 40s. Plenty of line tension! Below: 'Ger-off' – Jack Tisinia of Chicago launches his Korda Wakefield in the well supported vintage event – plans available from Aero Modeller Plans Service.

Above: Ric Dittman took first place in Junior/Senior scale F/F power category with this Cox .010 powered Loening M-8. At right: Lloyd Wood with his 2½oz., 1/20th scale Stinson Reliant rubber scale entry; and below, Bucky Servaites launches his $1\frac{1}{4}$ in. = 1 ft. scale Douglas 043-A, powered by a Super Tigre .09 diesel.

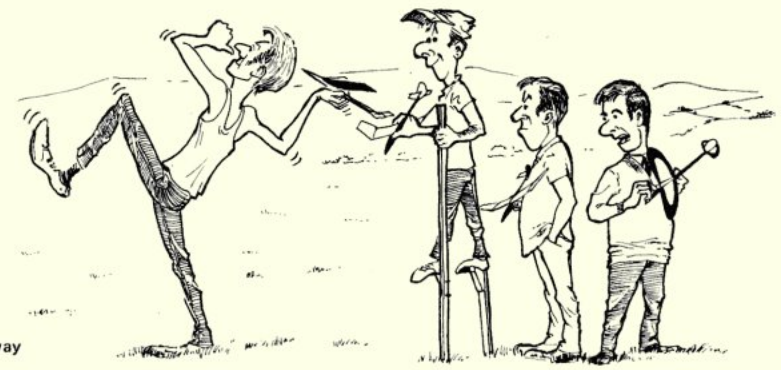




topical twists

by 'Pylonius'

illustrated by 'Sherry'



'Old Bloggs won't let anyone get away with a tactical advantage.'

Stiff Upper Lift

Chauvinism, these days, is not limited to keeping model hating females and other women libbers in their place, it is also aimed at putting your nation one up on all the others. Back in more sporting, less nationalistic times, when the World consisted of Englishmen and foreigners, the *Wakefield Cup* was competed for by gamey individuals who were model flyers first and flag waving nationalists very much second. Often the winner was an Englishmen (90 per cent of the entry) who did not have to wave his flag anyway, as it was already waving vigorously over most of the world. It was some time before foreigners took time off from fighting each other to join in the fun of playing games like football and flying model planes, but when they did get the hang of such things they proved to be much better than their tutors, so that the chances of an Englishman winning the Wakefield, even without a team manager, has become exceedingly remote.

Unlike other nations, who go in for international events with a positive chance of victory, we enter just for the old fashioned honour of competing. And, much to the amazement of a nationalistic world, which regards a sporting event as a sort of mini-war, we still continue the old world courtesy of proxy flying for absent nations. Now, with so many emergent nations throwing down their spears for similarly shaped model planes (think of the marvellous Wakefield launching training they have had) we have not only the Hanks, Jans and Serges to compete against but also the Wongs and the Oojis. This could well lead to a situation calling for regional qualifiers, thus keeping us out of those events we initiated altogether. When that time comes we shall read the headline: *'Famous Model Flyer Becomes North Korean National'*.

Winning Ways

What they do not go in for at International events these days is dignity. It was always so gentlemanly in the old days, that sedate walk to the take-off board and that flourishing launch like an olde worlde courtsey. Collecting up the bits just afterwards was apt to take a little edge off the poise, but the flyers, sportsman all, were never subjected to the degrading processes of detacticalisation. It is fair to say that they looked upon the thermals as gifts from heaven to chosen winners, not realising they had very earthy origins. Thus, they lived in ignorance of the subtleties of inserting the nose of the model into a funnel of warm air, and stoically launched their models into the coldest patches of drift, manfully accepting a rise off ground push disqualification. Just how they would have reacted to being shuffled along from launch point to launch point as a means of equating the warm air chances it is hard to tell, but might have objected to being smothered in soap bubbles.

Even with the officials vigilantly alerted to anyone getting a tactical advantage it is amazing how resourceful the human animal can be in pursuit of the kill. In fact something of a tribal effort is called for in the latest ruse. Where a model is reluctant to climb all the friends and relatives of the flyer gather under the model to move the air upwards by the frantic flapping of boards, papers and even shirts. This could be described not so much as tactical flying as all-out warfare.

Fly-Past

Was this the last Cranfield rally? If so it came as a fitting end to a glorious era of Galas and Rallies. Think of all the fun we had in our excursion coaches, how cute we looked in our funny hats, and what togetherness we had under the portable club windsock as it dipped in salute to yet another windless day. Then there were the sideshows. All the weird and wonderful models ever created were there to amaze and inspire us. Where else would we have seen 15 semi-scale models all finished in orange tissue, and a bevy of huge American gassies flown by huge early English modellers? We can even recall such institutions as C/L Stunt and Team Racing when they were mere novelties and even attracted the spectators. And what a spectacle were the first bang-bang rudder radio models; we thronged around in our hundreds to catch a glimpse of these wonders of the age.

Let's hope the men from the South Midland Area of the S.M.A.E. find a way of perpetuating this long established ritual – for at least another year.

Going Up

'Peanut' Scale, now all the rage, is nothing new. Many a modeller in the 1930s was introduced to the hobby by an American 12 in. span Scale model kit. The difference then and now is one of inflation only: one and sixpence as opposed to £1.50. And even that's peanuts these days.

Between the lines . . .

control-line matters aired by Dave Clarkson

International News

Russian C/L Championships

Reported by Nick Turkin, our correspondent in Leningrad, the Russian Championships were held in Minsk where the supremacy of the Russians in world FAI class team racing was illustrated by the following results:

	Heat	*Semi*	*Final*
1. Shapovalov/Onufrienko	3:54.6	4:07.7	8:19.6
2. Efremov/Maslov	4:09	4:09.3	8:46
3. Babichev/Bebeshko	4:16	4:05.0	Disq.

All used home-made motors of the TMA (developed HP) type. Rumour has it that the times were achieved with 50 lap range models doing 23-24 sec/10 laps (i.e. 93-97 mph). Wow! as a team race nut myself, I do not know how they do it. A Russian 1-2-3 at the next World Champs in Czechoslovakia seems likely for the third consecutive time.

Speed and Stunt were less remarkable as might be expected. In speed most competitors apparently used Rossis (surprise, surprise!) however, places 1, 2, 4 and 5 were taken by home-made engines, results being:

1. Burtsev (Kharkov) 227 km/hr.
2. Baidalinov (Kharkov) 225 km/hr.
3. Pereverzev (Leningrad) 225 km/hr.

Familiar names re-appeared in the top stunt men, viz:

1. Petrov (Moscow)
2. Kondatenko (Kharkov)
3. Plotsin (Riga)

U.S. Team Trials

From that excellent AMA publication – the *Competition Newsletter* we learn of the following from the U.S. Team Trials held at St. Louis on the 1st and 2nd of September.

F.A.I.-T/R

	Average Time	*Best Time*
1. Hodgkins/McCollum (California)	4:35	4:21
2. Albritton/Jay (Virginia)	4:43	4:33
3. Fischer/Oesterle (New York)	4:54	4:43

Hodgkins/McCollum used their ARM powered model for their first four flights and then unpacked their 'secret weapon' an exact (down to decoration) copy of Plotsin/Timofeev's '72 World Champs winning model complete with the winning motor to do a 4:21 and a 4:26. Albritton/Joy used a Bugl as inevitably did Fischer/Oesterle (with names like those how could they avoid it?).

The speed section of the Trials was unusual in that a Rossi 15 did *not* top the results which were:

	Average Speed	*Best Speed*
1. Chuck Schuette	225km/hr	227km/hr
2. Bob Spahr	219km/hr	230km/hr
3. Robert Heminway	215km/hr	215km/hr

Chuck Schuette used a Super Tigre X-15 whilst the two Bobs used the inevitable Rossi.

Stunt was topped by Bob Gieske flying his version of the famous *Nobler*, second was Gene Shaeffer with a single fin version of his usual two-fin design and third with his *Miss America*, apparently identical to the model that he won with at Helsinki in 1972, was Bill Werwage. Al Rabe from Texas missed selection by 13 points in the best two flights totals with his well-known semi-scale *Sea Fury*.

	Best Two Total	*Best Flight*
1. Bob Gieske	1839.0	966
2. Gene Shaeffer	1828.3	996
3. Bill Werwage	1804.7	943

Scandinavian Championships

Held on a car park in Oxelosund 20 km south of Stockholm during the weekend of the 14th August, our correspondent Werner Siggard of Denmark relates that this competition was organised with great efficiency by the Swedes. The Danes had a good day with individual victories in three events, viz. Team Race, Stunt and Combat, but due to not fielding a full team figured poorly in the overall team position. (1. Finland, 2. Sweden, 3. Denmark).

The first three in Speed used Rossis, Fagerstrom was very consistent with two back-up flights of 220 km/hr. Team race had a no-Bugl final, the 1st, 2nd and 3rd placers used Rumpel-Super Tigre G15 FI (Diesel), Rossi 15 (Diesel) and TMA respectively. In the final the Finns had the misfortune to plant their model at top speed thereby writing-off their TMA which was going really well.

Leif Mortensen (appropriately named as we shall see), the sole Danish representative, used a two-year-old model and a borrowed Super Tigre G20D to win Combat leaving a trail of five broken models (other peoples – not his) the last one being his opponent's in the final which he dismembered a milli-second after taking the winning cut.

Results:

Speed 1. Veikko Fagerstrom (Finland) 222 km/hr, 2. Markku Pietirnen (Finland) 218 km/hr. 3. Mats Bohlin (Sweden) 214 km/hr. **Stunt** 1. Lief Eskildsen (Denmrak) 5080, 2. Ove Andersson (Sweden) 4686, 3. Lasse Aaltio (Finland) 4253. **Team Race** 1. Hasling/Rivold (Denmark) 4:34 (last heat) 9:36, 2. Nore/Ekholm (Finland) 4:37 and 9:52, 3. Aamipalo/Fagestom (Finland) 4:31 and Retd. **Combat** 1 Leif Mortensen (Denmark), 2. Thomas Carlsson (Sweden), 3. Harri Hursti (Finland).

Danish Nationals

Reported by Werner Siggard once again, the Danish Nationals were held at Alborg on 2-3 September. The major interest was in FAI Team Race which was subject to a 'British invasion' with entries from the Tribes, Jim Broad and Ian Russell. Unfortunately, the British challenge came to nought in team race but found its target in Goodyear which was won by the Tribe 'tribe'.

Super Tigre G15FI motors converted to diesels by Emil Rumpel figured largely in the final team race results with Ole Hasling and Jens Geswendtner first and Jorgen Bobjerg and Werner Siggard third using these motors. Having seen Werner's model at Bochum in practice I can support Werner's belief in this motor – it really goes fast and is economical. Second place was gained by Per Hasling and Hans Geswendtner using their 17 oz. HP 15D powered model as used at Helsinki last year in the World Champs. Typical of Continental co-operation is the fact that this last model was fitted with a propeller made by Lief Lindt of Sweden, its motor was fitted with a piston made by Gunter Schwarz and lapped in by Emil Rumpel both of West Germany.

The Bobjerg – Siggard team racer held here by pilot Bobjerg is readily identifiable – this version having a lower aspect ratio than normal to cope with windy conditions. It went well in Sweden, but they forgot to count the laps– with the result that they landed after 99 laps . . . you do not make that sort of mistake twice in a hurry!

FAI Team Race Results

	Fastest Heat	*Final*
1. O. Hasling/H. Geswendtner	4:44	9:36
2. P. Hasling/J. Geswendtner	4:42	9:42
3. J. Bobjerg/W. Siggard	4:21	9:54

News from Home

Contest reports have come in thick and fast this month. I know that crop problems prevent responsible organisers from organising free-flight events on many fields during August, but this does not apply to we control-liners so why was August virtually empty of control-line contests? The inevitable result has been that September and early October have been crammed tight with contests. Unfortunately space does not allow lengthy reports but I hope that I have given the key data below.

Wymeswold – Midland Area Rally – 2nd September

According to a report received from Bill Draper of Nottingham MAC, this rally was held in fine, bright but very windy weather. Approximately 2,000 people gained admission to the field which makes this rally one of the best attended in 1973.

Stunt was badly hit by the wind which caused three crashes including three write-offs. One model was wrenched out of its pilot's control and proceeded across the airfield lines, handle and everything in a series of loops and turns to perform a perfect landing on the R/C landing spot completely unscratched. The pilot recovered his model and finished the contest – lucky man!

In the racing events (which featured rather poor entries) Williams/Millingship won FAI team race at their first attempt in this class beating King/Rudd and Neville/Graham both highly experienced teams. King/Rudd gained satisfaction in Goodyear by smashing their Woodford final record in 9:05 in the first ever all-glow final seen in the UK. Novices of the year Daly/Howard gave up their place in the novice final to allow another novice a chance, since they had also gained a place in the open final.

Combat was well supported with 43 entries. Because of the wind, downwind high-speed manoeuvring was the order of the day and this produced some most exciting bouts particularly in its later stages. In an all ACE final Vernon Hunt beat Paul Stanley by two cuts to one.

Results:

Stunt *(12 entries)* 1. John Newnham (Rolls-Royce) 1,736.5 pts., 2. Dave Day (Wolves 1,541 pts., 3. Ron Parsons (Blackburn) 1,476.5 pts.

FAI-T/R *(6 entries)* 1. Williams/Millingship (Feltham/Long Eaton) 10:47.5, 2. King/Rudd (Feltham) 10:50, 3. Neville/Graham (St. Albans) 11:18.

Goodyear *(13 entries)* Open Final: 1. King/Rudd (Feltham) 9:05, 2. Phinn/Halman (Grantham) 10:34.2, 3. Daly/Howard (Stockport) 13:05. Novice Final. 1. Chilton/Skidmore (CM) 11:55.8, 2. Darke/Darke (S. Bristol) 12:10, 3. Allcock/Gennard (Tipton) retd. 137 laps.

Combat *(43 entries)* 1. V. Hunt (ACE) 2. P. Stanley (ACE) 3. S. Turner (Peterborough) 4. M. Tiernan (ETT).

Western Area Rally – RNAY Wroughton – 16th September

I love going down South West, firstly because John Daly and I usually come back with a prize (!) and secondly they are a good crowd down there. Due to incorrect press announcements and really bad weather, few entries were received for the two events scheduled: FAI and B team race.

In FAI Team Race our K&B-powered *Sprint* gave us a 4:45 heat and this was the only under 5 min. heat time. The final was easy for us and considering the wind and the wet our winning time of 9:53 was quite fast.

Class B team race was altogether a much better affair. Surprisingly, Gray/Russell failed totally with their normally formidable Super Tigre TG20/23 machine, but this was more than made up by newcomers Daly/Bridge with a Dooling 29 powered model howling round on 40% nitro fuel. Neville/Graham with a very new motor improved slowly throughout the day as the motor ran-in, to win a rather slow final.

Results:

FAI – T/R 1. Glarkson/Daly (Stockport) 9:53, 2. Sutherland/Woodside (Leigh) 11:06, 3. Neville/Graham (St. Albans) 11:16. **B – T/R** 1. Neville/Graham (St. Albans) 8:13, 2. Daly/Bridge (Stockport) 9:19, 3. Carr/Penton (N. Sheffield) Retd.

Top: winner of the speed event at the Scandinavian Champs – Fagerstrom of Finland who recorded three very consistent times with his Rossi 15. Below are the team race winners from the same meeting – Hasling/Rivold. Their model was finished just before the meeting and has an electrically operated fuel shut-off to stop the Rumpel Super Tigre for refueling. At bottom are the winners of the Danish Nationals, Ole Hasling and Jens Geschwendtner who also used a Rumpel Super Tigre.

Northern Gala – Rufforth – 29th September

Like at Cranfield, the weather was cold and windy with the threatened rain finally falling heavily just before the finals were flown. Nevertheless this, the only Saturday competition in the contest calendar featured quite moderate entries, and quite fast times, especially in the racing events by Heaton/Ross who did a 3:53 in '½A', a 4:25 in FAI and a 3:16 in 'B' Team Race showing unmatched versatility; adding in their 5:06 Goodyear heat they repeated their performance of the last two Northerns in being the fastest in all four racing events.

FAI had the largest entry, besides Heaton/Ross's very fast heat other fast heats were by Davy/Howarth (4:36) – heave ho, Les! Clarkson/Daly (4:45) and Langworth/Muncaster 4:50. In the final Heaton/Ross had to withdraw with a broken undercarriage leaving Davy/Howarth to win with only four pitstops as opposed to our seven. The large puddles lying all over the flight circle made landing and taking off interesting to say the least. I had one just before John's pitting station and it gave an enviable source of brakes!

The other racing events were pretty uneventful except again for Roger Bridge's Dooling 29 Class B machine. This 30 oz. model does 116-120 mph, with better landing and restart characteristics this model would be a real threat to anyone. The 'B' final had to be postponed with the agreement of the proponents because of lack of light (i.e. it was night). It was held the next weekend at Topcliffe at the same meeting as the Goodyear Marathon.

Results:
½A-T/R *(7 entries)* 1. Heaton/Ross (Leigh) 8:22.6, 2. Davy/Howarth (Wharfedale) 8:55.0, 3. Langworth/Muncaster (Wharfedale/Novo) 9:17.5. **FAI-T/R** *(14 entries)* 1. Davy/Howarth (Wharfedale) 10:13.8, 2. Clarkson/Daly (Stockport) 10:28.0, 3. Heaton/Ross (Leigh) retired. **B-T/R** *(9 entries)* 1. Heaton/Ross (Leigh), 2. Barker/Hill (Wharfedale), 3. Goddard/Temporal (Wakefield). **Open Final Goodyear** *(9 entries)* 1. Heaton/Ross (Leigh) 10:14.5, 2. Clarkson/Daly (Stockport) 10:41.5, 3. Cooke/Everitt (Leigh) Retired **Novice Final** 1. Goddard/Temporal (Wakefield) 12:33.4, 2. **Junior Stunt** *(4 entries)* 1. Barry Homes (FFAST) 337 points, 2. Graham Worfolk (Allerton Grange) 239 points, 3. David Sharsby (Allerton Grange) 130 points. **Combat** *(7 entries)* 1. B. Stangroom (Wharfedale), 2. R. Ambler (FFAST), 3. B. Holmes (FFAST), 3. D. Smith (Guisborough).

Goodyear Marathon – Topcliffe – 7th October

The marathon is one of my most favourite events of the year. I suppose that this is because John and I have been very successful in previous years in this event with second in 1971 and equal first in 1972.

The notable occurrence this year was the excellent performance by Stockport novices Berry/Pritchard who flew 1,150 laps in the hour to place second. They used a Daly MVVS in a *Little Rebel* equipped with a large tank and a shut-off. First place Place/Haworth used their PAW 3.5 special powered *Johnson Special* to win with 1,192 laps. This was less than the 1,300 laps expected by Don mainly due to a line falling off (fortunately at a pit-stop and not in the air!) and having to be re-fitted.

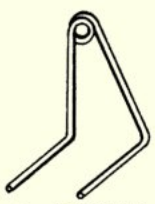


Figure 2 - EXTERNAL HORN
Sew and epoxy to elevator.

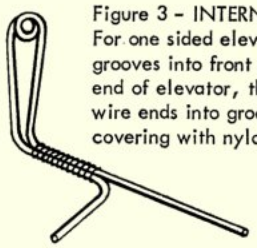
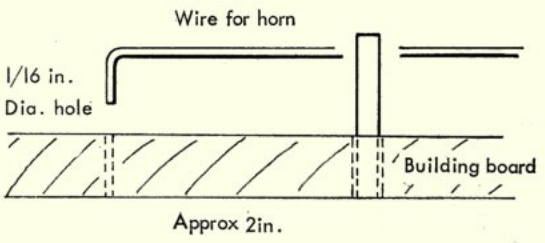


Figure 3 - INTERNAL HORN
For one sided elevator. Sand grooves into front and inboard end of elevator, then epoxy wire ends into grooves, covering with nylon patch.

Bind with fuse wire and solder

Figure 1.



Stockport club achieved 2nd, 3rd and 4th from their seven entries, these top three Stockport entries all being over the 1,100 lap mark. As evidence of rising standards in this event eight teams equalled or exceeded the 1,000 lap mark, a feat only achieved by the winner in 1971.

Results:	*Laps*	*Motor*
1. Place/Haworth (Wharfedale)	1192	Haworth PAW
2. Berry/Pritchard (Stockport)	1150	Daly MVVS
3. Clarkson/Daly (Stockport)	1145	Daly MVVS
4. Daly/Howard (Stockport)	1109	Daly G.15
5. Ross/Heaton (Leigh)	1045	Haworth ETA
6. Langworth/Brewster (Wharfedale)	1028	Langworth Oliver

Yes, Ross/Heaton is correct – Malcolm flew and Derek pitted. Notice that the top six motors were all, to a greater or lesser extent, specials.

Speed at Cranfield

For the first time C/L speed was included in the Cranfield schedule of events and produced a most friendly and interesting contest. Mike Billington (who provided these notes) won with a very new K&B 40 Schnuerle in a very small and light (19.7 oz.) model which achieved 172 mph with 40% nitro fuel – I should think that there is plenty more to come here as the motor was absolutely 'stock'. Anyway, a new '40' class record for Mike – just 8 mph short of the 60 class too. Incidentally, Mike, in common with the majority of speed fliers at Cranfield, used ML70 oil. Ken Morrisey in second place finished his best ever year – he has won all of the Northern contests this year except for Burtonwood, with his Super Tigre G.60 ABC model weighing 35 oz. and Ivor Roffey was third using similar equipment to Ken.

Mike notes that this contest may well mark the end of an era in British speed flying in that piped motors of the larger (5 and 10cc) sizes are now becoming readily available and therefore we should expect many new records next year. Noteworthy was Mick Nash de Villiers' home-made mono-line handle which is designed to take very heavy pulls, locks onto the pylon and has a semi-automatic safety strap system. This is a good example of getting one's priorities right – first make sure that your system is safe.

Results:
1. M. Billington (LAST) 172.0 mph (K&B 40S), 2. K. Morrisey (Sharston) 165.7 mph (ST.G.60 ABC), 3. I. Roffey (Elliot) 154.3 mph (ST.G.60 ABC).

Make it easy – bent wire horns

Horns bent out of 18 or 20swg wire are very quick to make and are surprisingly strong and easy to install. The basic requirement is for a loop in the middle of the piece of wire and this is formed in a few seconds on a simple jig as shown in figure 1

All that is necessary is to bend a 90° bend into the 18 or 20swg wire, insert this end into the 1/16in. diameter hole and holding the wire with the finger tips down on to the board and against the peg, wind the wire quickly and tightly around the peg. With the loop in the wire we can now make other types of horns as shown in diagrams 2, 3 and 4.

I have used such horns bent out of 20g wire for combat models, Goodyears, FAI and B Team Racers with no signs of bending or distortion in use. For big stunters I would recommend that 18g wire is used because of the bigger throws and distances involved.

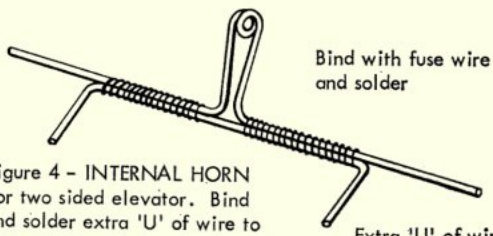


Figure 4 - INTERNAL HORN
For two sided elevator. Bind and solder extra 'U' of wire to give attachments to elevators on both sides, as described in figure 3

FREE-FLIGHT COMMENT

'Butch' Hadland, representing the Royal Air Force Model Aircraft Association at FFn International Contest, Strubby, with his pair of Wakefields which have curled down tips to improve airflow.

by John O'Donnell who unravels some of the 'mysteries' of flight

SOME INDICATIONS of the mechanism by which a wing produces lift were outlined in the June issue. The process depends on increasing the air pressure on the wing undersurface and/or simultaneously decreasing the pressure on the upper surface. Due to the shape of the wing section and the characteristics of the airflow, this pressure differential is not constant along the wing chord. Most of the wing lift is produced by the forward part of the wing – particularly when the wing is at a high angle (of attack) to the main airstream (see figures 1 and 2).

Since the generation of lift usually involves flying the wing at an angle, it might well be thought that increasing the angle should increase the lift – and indeed it does at first. There are, however, other effects as well. Drag also increases with angle, whilst the lift of the wing moves even more forward. Moreover there is a very real limit to the angle of attack! Past a certain point (that varies with both section and model characteristics) the flow round the wing breaks down – often suddenly, and always with a dramatic loss of lift. This is the dreaded stall – inconvenient with models, but often disastrous with full-size aircraft.

Figure 1

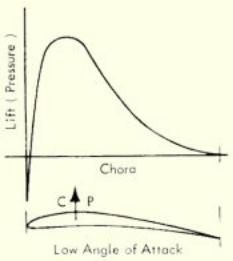
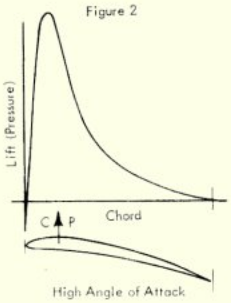


Figure 2



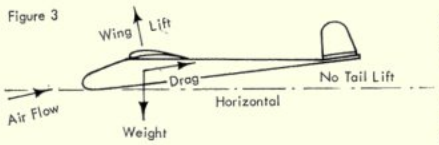
In flight a model is subject to various forces – such as lift, drag, weight and thrust. Normally their relationship is arranged so that they form a positively stable system – this means that the model will recover from a disturbance and resume its earlier flight path. On its own, a wing of normal section is unstable due to the fact that the forward movement of its lift with increasing angle of attack tends to increase the angle further (see figures 2 and 4). Similarly the opposite is also true!

Control of this 'pitching tendency' is the purpose and function of the tailplane – which is why our American friends call it a 'stabiliser'. It also serves to ensure that the wing is indeed flown at the intended angle of attack. This is important since it is usually necessary to adjust a model to fly near the stall in order to obtain good glide performance, i.e. low rate of sink. Obviously this is 'living dangerously' since models are subject to various disturbances, from poor launches to gusts – all of which can affect the airflow and possibly initiate a stall.

To simplify discussion it is often convenient to think of the wing lift as being concentrated at a single point – usually called the 'centre-of-pressure' or C.P. This is analogous to the way in which the mass of the model is regarded as acting at the 'balance point' or centre-of-gravity' (C.G.) At the sort of angles appropriate to model glide conditions the C.P. is in the region of 30% of the wing chord measured from the leading edge (see figure 1).

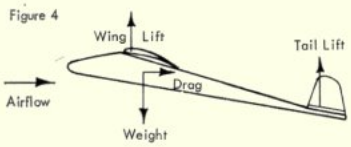
The simplest force arrangement is to have the C.P. and C.G. coincide as shown in figure 3. Note the inclusion of drag, a force that opposes motion in the same way as friction. If our hypothetical model is disturbed by, say, a gust so it tries to fly in a nose-up attitude, then the C.P. will move forward as already mentioned. However, the nose-up attitude also causes the airflow to alter over the tailplane so that it produces lift. Since the tailplane has the advantage of a long

Figure 3



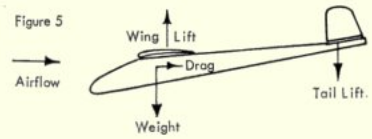
C.P. and C.G. coincident -no tail lift. Normal flight, in equilibrium. Note : lift is perpendicular to airflow and drag is parallel - they are not vertical and horizontal. Weight always acts vertically.

Figure 4



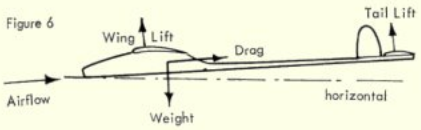
Model trying to fly nose-up. Tail lift provides nose-down (corrective) moment. Situation unstable, hence forces out of balance horizontally.

Figure 5



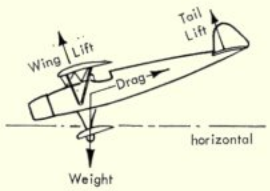
Model trying to fly nose-down. Tail "lift" provides nose-up (corrective) moment.

Figure 6



Rearward C.G. balanced by tail lift. Still stable

Figure 7



High drag needs nose-down attitude to incline lift sufficiently to balance large drag (i.e. horizontal components must balance out)

'moment arm' (distance from the C.G.) the tail's corrective effect is usually sufficient to depress the model's nose and restore the 'status quo'. In a similar fashion a nose-down attitude causes the tail to 'lift' downwards and over-ride the rearward movement of the centre of pressure (See figures 4 and 5).

As the tailplane does not lift in normal flight – only when disturbed – it has to be set appropriately. A symmetrical (or flat plate) tailplane would be rigged with its centre-line parallel to the airflow. The more normal flat-bottomed-airfoil tail needs to be positioned at its 'angle of zero lift' which is usually a few degrees *negative*. Naturally enough a model rigged as just described has considerable 'longitudinal dihedral' or difference between wing and tail incidences. The end product should be stable but could well be inefficient on other counts.

Normally a free-flight model is rigged with its centre of gravity much farther back than the 30% wing chord associated with the centre of pressure. In fact, the usual range of C.G. locations is from 50 to 100% chord – and odd examples off the wing are sometimes encountered. The rearward C.G. merely means that the tailplane has to provide some lift in normal flight (see figure 6). Hence the tailplane has to be at some angle of attack to the air flow, with an inevitable reduction in the longitudinal dihedral.

In moderation these changes have little effect on the general stability of the model – and they do produce a more efficient model. Not only does the tail contribute to the overall lift, but there seems to be some effect on the total model drag. A secondary effect can come from the use of less nose-weight and hence the producing of a lighter model. Incidentally, the relationship between high drag and poor glide may be apparent from figure 7.

Like most techniques, that of moving the C.G. back can be overdone. With most conventional designs the symptoms are the combination of a good glide (if undisturbed) with a marked reluctance to recover from even a gentle stall. With designs featuring large tailplanes and C.G.'s around the wing's trailing edge there can be a disconcerting tendency for the model to *dive-in* following a stall. The methods of obtaining a stall recovery are tied-up with circling flight – a complication I have not yet mentioned and one that I intend to leave for a future column.

Glider queue at the FFn Internats, with S.M.A.E.'s Tech. Secretary and Juryman Peter Freebrey surveying Ian Dowsett's A/2. Note the September sunshine!

CONTROL LINE
Team Trials

R.A.F. North Luffenham, October 14th

The Tribe Brothers (at left) have now qualified for membership of an official British team, but Continental racing is not new to them. Here they are seen with Bobjerg, another keen British modeller Jim Broad and Werner Siggard at the Danish Nats which they competed in before journeying to the Bochum International, reported last month.

TRADITIONALLY it seems, the Team Trials which we use to select the modellers who are to represent us abroad (in this case the 1974 World C/L Championships, scheduled to be organised in Czechoslovakia) are held at the end of the previous season. This, we would suggest, is not good practice, even if we accept the principle of a team selected on the basis on one day's performance. The disadvantages are many, but the likelihood of cold weather is perhaps the worst aspect. Take this particular case as an example: the weather was distinctly cold on October 14th with a stiff wind, while the conditions in Czechoslovakia around August/September are likely to be extremely warm. The teams who succeeded on this occasion performed well under the prevailing conditions, but would the results have been different with the temperature raised at least 20 degrees Fahrenheit?

Speed fliers are particularly affected by cold weather, especially when using F.A.I. fuel – the motor can be heard to 'cool off' as it comes into wind on each lap, making a top-class flight almost a lottery, if not an impossibility. Likewise in team-race, some motors perform noticeably worse in cold conditions, while in aerobatics a cold hand lacks 'feel' and hence precision is affected. Many were the competitors who would prefer the results of several contests to be taken into account, which would at least reduce the chances of a team selected purely under 'cold' conditions.

Despite these comments which concern the timing/structure of the Trials, it must be made clear that these were the best organised (and supported) Trials for many a long year.

Aerobatics had the luxury of a 'full set' of judges consisting of Messrs. M. Harvey, C. Green, J. Harley, D. Blake and J. Lynch who acted as 'line judge'.

On looking at the line Judge's score sheets it appeared that his marks were well in line with those awarded by his colleagues which seems to prove that line angles can be seen fairly well from the up-wind position. Cynthia Blake, wife of the C/L Sub-Committee Chairman, added the scores keeping pace with the action at all times. A scoring system of the best two flights from three was used, and in the interests of judging consistency, all entrants were requested to make three flights.

First to fly in Round 1 was Jim Mannall, but due to engine problems he called an attempt and flew at the end of the round. He was followed by Steve Blake who failed to complete the schedule, his motor cutting in the clover leaf, which was a pity, as he was heading for a good score. Next up came John Heanen with his usual neat performance, although he seemed to be rather off-track in the overhead manoeuvres. Pete Tindal flew next, but with his Fox 40 set lean, the model flew far too fast, resulting in a misplaced pattern. Number five, John Newnham, flew to his usual standard, his score being second best of the round. Last but one to fly was Ron Parsons who seemed to be having an 'off' day, and he was followed by Jim Mannall on his second attempt who made no mistake this time, and topped the round.

After a 15-minute break to get the circulation going, Round two commenced in the same order. Though Jim Mannall had continued engine trouble, once the model became airborne he produced a second well-scoring round, dropping only six points. Steve Blake flew a much improved pattern, his motor lasting to the end, and it was obvious that the contestants were getting used to the conditions, as John Heanen and Pete Tindal increased their scores. Ron Parsons completely lost the round due to his engine failing to start.

After lunch, Round three was flown in reverse order. This time Ron Parsons got his engine going and recorded a better round and John Newnham's third flight was his best of the day, but Pete Tindal dropped his score slightly. The remaining three to fly all recorded much better scores, but Jim Mannall seemed plagued with engine problems, the model having to be held nose down before take-off.

Incidentally, Steve Blake was less than confident at placing in the team, having had virtually no practice at all for nearly a year – added to which was the fact that he was married the day before the contest and this was the first day of his honeymoon. . . . Congratulations, Steve and Rosemary!

Team race too, had a 'full set' of officials, with Pete Freebrey, Don Howarth and Pete Richardson acting as a jury, and John Horton performing stirling service with lap-counting/timing duties, aided by 'off-duty' competitors. With the help of a loudspeaker system, Pete Freebrey was able to issue 'warnings' which the pilots just could not misinterpret and Pete's verbal bombardment must have shaken a few pilots who thought that they were capable of whipping unnoticed! In this way the Trials provided a useful training session for budding T/R crews – it being quite a jolt for some to find themselves up against a jury as strict as may be encountered at a World Champs – several were disqualified for stepping out of the pilot's circle before the model was in the pit-man's hands.

Each team was given five flights, then the fastest and slowest times were discarded and the three remaining flights totalled to provide a result. In this way 'bad luck' in one flight could be overcome, while a flight containing unnoticed 'assistance' would not count either. Consistency was the all-important criterion.

Twelve teams entered, and it was not surprising to see Heaton/Ross come out way on top with their Bugl-powered camouflaged racers, their best heat times being a 4:35.7, and worst 4:55.8. Incidentally, in this latter heat they could have claimed a re-flight – one of their opponents (Bernie Langworth) tripped while flying, and as he fell, grabbed Derek Heaton's arm. This naturally gave the model a quick 'twitch' of down elevator – sufficient to trip the fuel shut-off, forcing the Leigh pair to make an extra pit-stop! F.A.I. rules do not really cover such a situation. . . .

The Tribe brothers were remarkably consistent with their Bugl-powered racer (4:52, 4:52.4 and 4:50.5) obviously their past year's hard work of practice, and yet more practice, has begun to pay off, but over-enthusiasm is something they will have to watch out for – their flying style can border on the illegal and indeed they suffered one disqualification for 'foot out'. Nonetheless, they have certainly improved a lot and are beating lots of 'names' regularly.

Third team place was hotly contested by some five teams – in fact, just 25 seconds separated 3rd and 8th places! In the end, the decision went to King-Rudd who beat fellow Feltham flyers Harknett/Smith by a total of nine seconds, though both were down on their usual performances. Clarkson/Daly had a disapointing day with firstly a cockpit canopy which fell off just before a heat (the delay fixing this used up their engine 'warm up' period, resulting in a 'cold' run) while they later had an elevator fall off. In addition, the K&B obviously prefers a warmer climate – and who could blame it!

The overall impression was that many of the pilots risked disqualification either through placing a foot outside the flight circle too soon (one pilot had two consecutive disqualifications for this) or by blatant whipping. Also, many of the flying styles were deliberately obstructive, and while

the *Sporting Code* does not impose specific penalties for this, it is possible that a 'hard' jury may place their own interpretations. As it was, many pilots were forced to run around the perimeter of the flight circle as a 'wide' pilot took large strides to slow him down. In one flight, it was estimated that Heaton was slowed by some 15 seconds, although admittedly being left-handed makes him especially susceptible to 'blocking'. Also, the customary 'one lap whip' on take-off is being somewhat abused – it's amazing the pull that the lines can stand on occasions!

Speed was run efficiently and strictly, by Gordon Farnsworth, and many was the pilot who was unaccustomed to flying as per rule book, especially with regards to the 'five minutes per flight' rule. Due to the ever-constant threat of rain, Gordon rushed the rounds through without pausing for lunch and thus by early afternoon the team was known.

Allan Woodrow provided the exception to the rule that you cannot go fast when it's cold – he set a new British record of 137.64 m.p.h.! Always something of a 'dark horse' in speed flying, Allan must have been getting in lots of practice down in Yeovil recently. However, it was a bad day for the North Sheffield club – neither Brian Jackson nor Bill Firbank managing to qualify, although Bill did equal third place David Smith's best time of 129.68 m.p.h., but lost out on his back-up flight.

Previous team member Ron Irvine failed to record an official flight, his main trouble being insufficient fuel – the Rossi gobbling up the normal quota of fuel far quicker than normal – in fact, the model/tank/motor is exactly as used at Helsinki in 1972! Business commitments have left Ron little time for practice since then – the same 'complaint' being extolled by Mick Callaghan. He was particularly unlucky, having achieved over 130 m.p.h. in practice with his Miebach-tuned Rossi, complete with a thoroughly reliable centrifugal force fuel switch. Alas, lack of experience at flying 'in the pylon' caused him to 'dump it', wrecking the model, but fortunately not the engine.

For the first time, height markers were in use, which proved embarrassing to some – both Allan Woodrow and Gordon Isles suffered a disqualification on one flight for flying high. Gordon suffered take-off dolly problems but even so only narrowly missed a team place, his one 'official' being 129.3 m.p.h., another 0.5 m.p.h. and he would have been in!

There was a certain amount of controversy over the flying style adopted by the first-placed flier, Allan Woodrow, as his handle was held at an angle of at least 45 degrees to the lines, thus he was looking along his right shoulder in flight. However, it was decided that he was not applying physical assistance to the speed of his model (it being virtually impossible to whip when in the pylon), but it does indicate yet another loophole in the rules – the Sporting Code does not specify the angle at which the lines must leave the handle. Actually, Allan's reasoning for this flight style was sound – the model was over-sensitive and when jogging around the pylon the line lengths are not altered relative to one another when the handle is held in this fashion. In other words, the model was de-sensitised. Let's hope he moves the C.G. forward before Czechoslovakia so as to avoid a potential 'problem'.

Results:

Aerobatics: 1. J. Mannall (Buckaneers) 2,000 pts.; 2. J. Newnham (Rolls-Royce) 1,918.5 pts.; 3. S. Blake (Buckaneers) 1,918.5 pts. **Team Race (Total 3 flights): 1. Heaton/Ross (Leigh) 14:12.0; 2. Tribe/Tribe (Cosmo) 14:34.9; 3.** Rudd/King (Feltham) 15:01.8. **Speed:** 1. A. Woodrow (Yeovil) 137.24 m.p.h.; 2. P. Halman (R.A.F.M.A.A.) 130.05 m.p.h.; 3. D. E. Smith (Lee-on-Solent) 129.68 m.p.h.

READERS' LETTERS...

SOARING IN SHEFFIELD

Dear Sir,

May I take up one or two column inches to point out to readers of the *Aero Modeller* some local rules which affect the Sheffield S.A.'s continued use of their Peak National Park flying site?

(1) Much of the moorland area is privately owned or belongs to bodies such as the Waterboard for the area.

(2) Negotiations for the use of sites have never been easy, and only recently the Sheffield S.A. has taken the full rental load for flying purposes, a load previously shared with another club.

(3) No members of the S.S.A. fly internal combustion models in Peak Park areas because of the annoyance caused to other users.

(4) We have been asked specifically to inform members of the general public (i.e. everyone NOT a club member) when they are trespassing on private property, and ask them to leave the area concerned.

Anyone visiting the area should, we feel, exercise a degree of common sense and courtesy with regard to the above points; other parts of the country, no doubt, have equivalent restrictions which affect modellers in the locality and which, if flouted by 'casuals', can act to the detriment of the long-term interests of resident fliers.

It should also be remembered that many Insurance Policies are invalid if models are not flown from an approved site.

A recent small invasion from the South-West resulted in mor flouting of locally observed rules in a half hour than happens during a year of Club Activity, the attitude being one of *'we're not doing any harm'*. The harm done by the ignoramus lingers in his wake and is suffered by others. A courteous enquiry about local conditions could save a great deal of trouble, and will usually lead to an equitable arrangement. Unfortunately, modelling appears to attract many who would be shown the door in other types of Sports Clubs, and only constant efforts to raise levels of behaviour and consideration by the majority of model fliers can offset the harm caused by the foolish minority.

Over the past season it has given me great pleasure to see the enjoyment that a good afternoon of Club activity provides for tourists to the area. There is a greater appreciation nowadays of the sheer beauty of model flight and of operator skill (there is often quite spontaneous applause from observers!) This indicates that the prestige of the sport is growing, and we are all to some extent, its ambassadors.

Bradway, Sheffield. Trevor Faulkner
P.R.O. Sheffield S.A.

VINTAGE CLARIFICATIONS

As the Director of the Vintage event at the Northern Area Rally I would beg leave to clarify various inconsistencies in John O'Donnells report in the November issue concerning the disqualification of his entry.

His model was ruled ineligible in that the turbulators fitted represented an aerodynamic modification, airfoil characteristics being drastically altered by the addition of same, and consequently the aircraft was not considered as being in accordance with the published plan. Although it was pointed out that the model would be acceptable if these additions were removed, this was refused on the grounds that it would then fly no better than any other *Scram* entered, and my ruling was hotly contested with public accusations of personal discrimination and victimisation. An appeal against the disqualification was placed before the N.A. Competition Secretary who, after serious consideration, upheld my ruling.

The question of 'structural modification' did not arise as stated, in this context, and such work is NOT prohibited under SMAE rules, which allow minor strengthening but do not specify a limit to which such work may be taken.

The ensuing 'repercussions' were entirely at the instigation of Mr. O'Donnell at the end of the contest, which unfortunately I had to leave at 4 p.m., and would largely appear to be the outcome of disgruntlement on his part. However, his objection to the entry flown by J. Reavley was quite valid – the model was entered and flown after my departure from the entry table and was accepted in good faith by other officials present who were unfamiliar with its prior history. I would mention that Mr. Reavley has at no time made any secret of its origins.

Ewan Jones's 'Mallard' has a sheet fin substituted for the built-up original following destruction of the latter when the model was blown over on a past occasion. The replacement is accurate in both outline and thickness and was accepted as a modification within the scope of the rules and, had I been able to be present at the final controversy I would have opposed the objection most strongly with, I trust, a different outcome to the results.

Finally, I do not agree that these happenings will ruin Vintage in the long term although such may well have been the outcome had John's model been accepted, thus opening the door to others, more interested in 'pot-hunting' than the spirit of the event, to employ greater licence in the interpretation of a given design. Vintage enthusiasts, in general, build exactly to plan . . . Mr. O'Donnell's admission of working only 'very closely' may well rouse doubts as to whether other small variations might have resulted.

Leeds, Yorkshire *J. Moseley*

Jon Davies, member of the U.S. team at the Wiener Neustadt World Champs also made it to Strubby to help add to the 'International' flavour. Here he winds the motor for his Wakefield which was featured on the cover of the November issue.

John O'Donnell gives a contestants view of the 'privately organised' meeting, held at R.A.F. Strubby September 7-9th

FREE FLIGHT NEWS INTERNATIONAL

BEING THE first free-flight International Contest held in the U.K. since 1958 is sufficient to make this meeting noteworthy. What made it unique was being run as a private venture by a few individuals, rather than by S.M.A.E. or even an Area. Even so, to qualify for inclusion in the F.A.I.'s Calendar, the whole undertaking had to be 'approved' by the S.M.A.E. after 'vetting' for financial and other arrangements.

For International Meetings the F.A.I. Sporting Code demands much from the organisers (as well as the competitors) especially as regards processing and the like, while some requirements, like jury representations, involve considerable expense. After all these preparations, and a considerable number of inquiries, the actual foreign participation was most disappointing and comprised exactly one representative apiece from Belgium, France and the U.S.A.

Even the British enthusiasts were slow to enter – presumably due to the substantial (by domestic standards) entry fee of £3.50, or a pound less if willing to timekeep. Eventually, nearly 100 people provided 112 individual entries – over half of which were in A/2 glider. Surprisingly, there were 17 'no scores' – mostly through non-arrival!

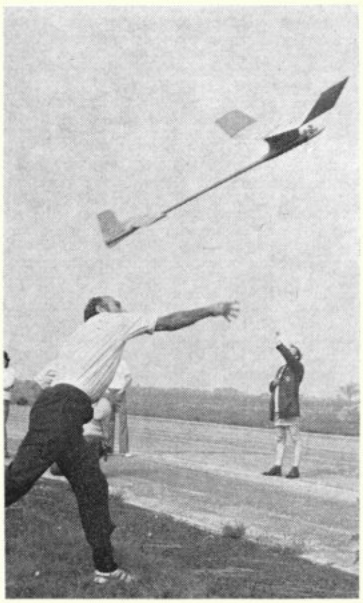
For many entrants the contest was a three-day affair, with the Friday devoted to test flying, Strubby being 'available' the day before the actual competition as per the F.A.I. requirements. Events on the Saturday were a little slow to start due to the organisers cutting their arrival 'too fine'. At this stage the weather was incredible – flat calm with early mist rapidly clearing as the sun broke through, to give conditions that were quite literally hot enough for bikinis!

The contest was run in 45-minute rounds in a Power, Wakefield and A/2 sequence while the F.A.I. starting line was used with 'pole positions' being predetermined (I suspect by the organisers rather than by 'draw') and moved along the line each round. This arrangement soon showed up the defect implicit in the basic idea – with the line of posts partly over grass and partly over tarmac or concrete, one's position could be critical with 'marked' lift sometimes out of reach. This applied particularly in Wakefield which is just as dependent upon thermals as A/2 – but which cannot be towed to the appropriate place! Wind variations meant that the line of posts did not always remain crosswind, and again this could be advantageous to some contestants – those who found themselves on the downwind end!

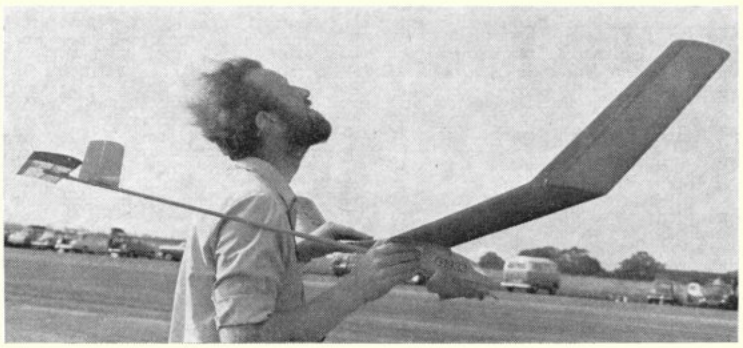
Even more radical than the posts was the timekeeping system – to the British modeller at least. Two 'official' timekeepers were allocated to each post where the fliers were expected to fly one after another. Most timekeepers had been recruited from the fliers (of other events) by the reduced entry fee already mentioned. Too often they were late in arriving at their post and this effectively shortened the available flying time. Even with the co-operation of the other contestants, a flier could well have very little time in which to make his flight. This applied particularly in Glider where there were four fliers per post, giving each a nominal 10 or 11 minutes to fly. This situation was circumnavigated by some groups who split up the two official timers, found each a companion, and hence flew two models simultaneously. While the basic system is common on the Continent, I cannot accept that it is an equitable and satisfactory way to run a contest.

The events started with Power. Despite the calm, hot conditions the air was surprisingly 'dead', and any mistakes under power were reflected in the subsequent duration. There were only three maxs and one 'near miss' from nine or ten fliers. This low standard was typical of the whole power contest in which the flying could only be described as mediocre. Despite the common use of sheeted wings and tails, power patterns were often inconsistent.

Wakefield had three times the Power entry – and the same



Left: Jack Allan launches his power ship but had his hopes ruined by a double over-run. Sheeted surfaces and G/F rod fuselage. Below: Pete Freebrey waits for signal to release Ian Dowsett's A/2 – note perspex canopy.



'dead' air for the first round. There were a dozen maxs, most of which only scraped the three minutes, and plenty of very poor scores. This is typical of much Wakefield flying, where 'non-thermal' durations can be well under two minutes (despite the usual still-air claims of around 3½ minutes).

The first A/2 round saw the first real lift of the day, with Dave Yates marking what proved to be real monster thermal. He had towed well 'upwind' and this gave plenty of time for two 'waves' of fliers to launch. A number of those forced (by the timing system) to 'wait their turn', then towed downwind to join the thermalling herd! I would estimate that two-thirds of the A/2 entry flew in this one thermal.

Conditions remained nearly as calm for the second round, although the drift direction reversed. Although the number of maxs per round was similar, the number of 'full houses' fell dramatically. As there were signs of the wind strengthening it was decided to move the launching line part way across the 'drome to suit. This obviously took time, but by eliminating the lunch break the contest got back on schedule. Unfortunately, the wind continued to be fickle, and the third Wakefield round soon saw models drifting at 90 degrees to that expected, and straight out of the airfield into a group of trees and farm buildings. Those who flew at this stage not only lost valuable time due to the obstructions, but returned to find the round had been 'interrupted' to move the line a second time!

As this gave far better visibility to those still to fly, plus vastly reduced chances of damage I 'protested' the interruption. The Jury accepted my protest, but had obvious difficulty in finding a satisfactory solution. Finally, those who had flown early were offered a second chance if they wished to re-fly, and 15 minutes were allowed for this. Only three took the re-flight, and of these I managed to repeat my first score exactly!

Models were still drifting out of the 'drome, so a further move was instigated for the fourth round – this time right across the airfield. There was now a steady breeze and a generally overcast sky. Lift was naturally weak, although the Wakefields 'drawn' near the runway generally found some help. A/2 proved to be very tricky indeed with a mere eight maxs being recorded, despite there being very few retirements. As an aside it was remarkable just how many fliers continued right to the bitter end, even though their hopes must have long since died.

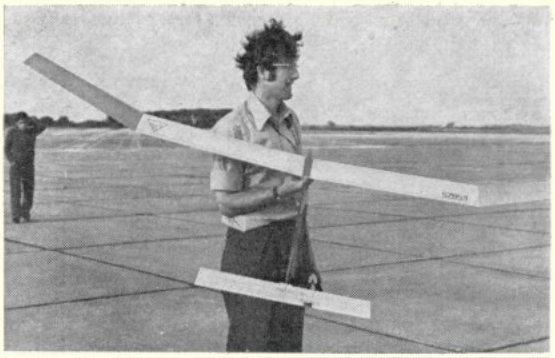
At the end of Saturday's flying there were only two perfect scores in Power (Monks and Allen), one in Wakefield (Lefever) and three in A/2 (Dilks, Williams and Yates). While Power was unimpressive and Glider the usual 'game of no mistakes', fortunes in Wakefield were fluctuating – and a lot of fliers were in a competitive position.

The airfield cleared rapidly after the fourth round, influenced, no doubt, by the 'social evening' arranged in a hotel in the nearby village. From what I hear this proved most successful, with a well-stocked buffet that extended to providing chicken 'left-overs' for many campers' breakfasts!

Sunday had three rounds for each category, and started a little breezy – although it could hardly be called windy. The pace continued much as before, even to a move of control and launching line prior to the final round. The day started misty, went sunny and eventually clouded over – to complete a weekend of very varied weather.

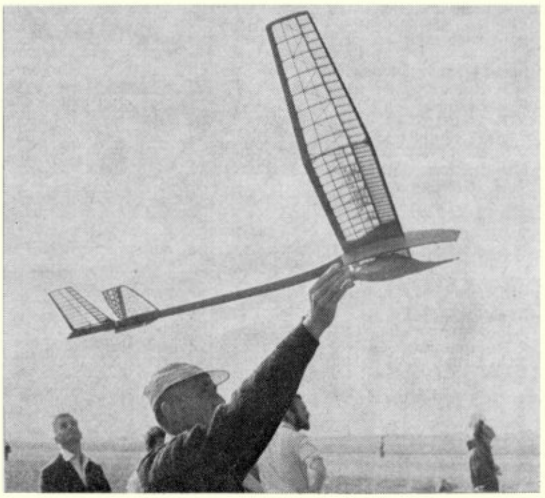
Wakefield had an easy fifth round if the number of maxs was any indication. In contrast, the sixth and seventh seemed difficult. This gave continual movement of 'top' positions, depending upon who missed the lift. At the end of the penultimate round I was leading, by just two seconds ahead of Jon Davies of the U.S.A. Misjudging the air on our final flights saw us drop to fourth and sixth respectively. Final maxs from Ron Pollard and Laurie Barr were sufficient for them to climb to first and second. Ron flew two of the black and red models that he took to the World Champs – changing models half-way through the contest. Both featured anodised (black) aluminium front fuselages, rolled sheet booms with plenty of epoxy reinforcement, Schwartzbach propellers and elliptical tipped wings of Koster section. Laurie flew his usual style model developed from Roy Wotton's design. Third was Ray Elliot, three seconds behind Laurie and five in front of my delayed-prop model. It is appropriate to mention that Albert Fathers scored sufficient time for third place – but post-contest processing found his model was underweight by several grammes and he was consequently disqualified.

Ray Monks continued to max on the Sunday in F.A.I. Power, and won convincingly with one of his Championship models. Dick Johnson did five maxs after two sub-three-



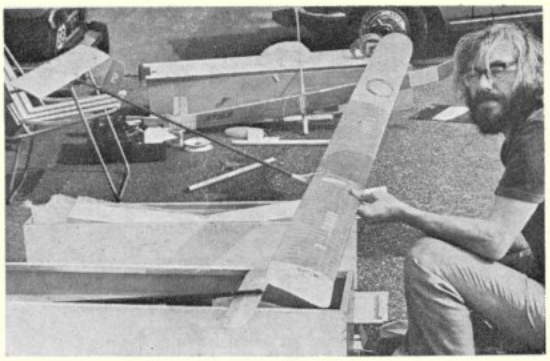
So close . . . Pete Williams (above) and his A/2 with which he placed second after a ninth round, following the F.A.I.'s progressive max fly-off system.

Hello, that's not right! Ron Pollard (right) surveys the tailplane which broke on his last flight which nonetheless gave him first place in the Wakefield event.



Left: French A/2 of Felgines, launched by Bogaerts of Belgium – unfortunately the wing broke in an ensuing line tangle.

Right: Gary Madelin failed to max out in round four, but with an otherwise perfect score, finished fourth in the A/2 class.



Left: that man Monks again! Ray alone achieved a perfect score in the poorly supported Power event, using one of his familiar Championship models. Above, Geoff Lefever who started well in both Wakefield and A/2 – but his luck didn't hold out – seen here with his glass-fibre fuselaged A/2.

minute flights in the first two rounds and took second place. It might well have been third, but Bob Bailey was given an over-run on his seventh flight, allegedly since his timers could not hear his engine cut, thanks to another engine being started nearby. Naturally, the flight max'd but the second attempt was 50 seconds short. There was talk of a protest but it didn't materialise. Unlucky was Jack Allen who dropped score on his fifth flight and then missed a sixth round score altogether. He had chipped a propeller tip unnoticed, and the resultant vibration upset his timer, leading to an over-run.

Glider eventually provided the only fly-off of the weekend. Of the three perfect scorers from Saturday, Dave Yates fell down badly thereafter. This left Terry Dilks and Pete Williams to complete their seven maxs and fly-off for first place. The deciding flights were to the F.A.I.'s progressive max system with but four minutes allowed for launching.

Terry towed up first and promptly 'catapulted' his model off into a good thermal to record an easy four minutes plus. Peter's flight looked much more uncertain but eventually 'worked into' lift and also max'd. Motorised recovery had both models back remarkably quickly for a ninth flight that proved decisive. Terry got away well in air that 'petered out' to give a 2½-minute flight, while Peter was down in under 100 seconds. The winning model was conventional enough, and owed its success to being flown well by a 'man on form'.

Third place went to Terry's clubmate John Boon who had dropped ten seconds in the easy first round when his model collided with a tree! Gary Madelin was fourth due to 'only' 2½ minutes in the late Saturday round – mainly due to a tendency to spiral after a stalled release.

The meeting concluded with a formal prizegiving under cover in the airfield's Officers' Mess building. Awards were presented by the C.O. of R.A.F. Manby, Group Captain Bayley and were impressive by normal domestic standards. Apart from the perpetual trophies and replicas to the three winners, there was an assortment of merchandise that extended the prize list down to tenth in A/2, eighth in Wakefield and sixth in Power. Modelling goods had been donated by both Trade and individuals, and it was heartening to see such support.

Finally, it is more than interesting to record that the organisers asked me to send *Free-Flight News* a criticism of their efforts with a view to 'doing better next time'. With such an attitude the 1974 affair should be very good indeed!

A/2 winner Terry Dilks with his conventional design model, also employing glass-fibre rod fuselage and carrying a double-timer system for extra security.

Results

Class F.I.A. – Glider

1	T. Dilks (GB)	1260+240+146						
2	P. Williams (GB)	1260+240+99						
3	W. Boon (GB)	170	180	180	180	180	180	180=1250
4	G. Madelin (GB)	180	180	180	149	180	180	180=1229
5	D. Tipper (GB)	180	180	180	144	180	180	180=1224
6	B. Baines (GB)	180	180	155	162	180	180	180=1217
7	A. Jack (GB)	180	180	180	123	180	180	180=1203
8	E. Drew (GB)	180	180	114	158	180	180	180=1172
9	J. Billam (GB)	180	180	97	161	180	180	180=1158
10	D. Truluck (GB)	180	180	95	158	180	180	180=1153

(59 entries)

Class F.I.B. – Wakefield

1	R. Pollard (GB)	180	113	177	180	152	180	180=1162
2	L. Barr (GB)	127	107	180	180	180	180	180=1134
3	R. Elliott (GB)	127	156	147	180	180	180	161=1131
4	J.O'Donnell (GB)	180	180	141	155	180	180	110=1126
5	J. Baguley (GB)	180	180	148	134	180	180	119=1121
6	J. Davis (USA)	180	180	166	180	180	128	97=1111
7	M. Woodhouse (GB)	180	71	180	180	180	127	180=1098
8	C. Hadland (GB)	147	180	180	168	156	167	95=1093
9	A. Jack (GB)	158	180	180	158	168	109	134=1087
	G. Lefever (GB)	180	180	180	180	116	71	180=1087

(35 entries)

Class F.I.C. – Power

1	R. Monks (GB)	180	180	180	180	180	180	180=1260
2	R. Johnson (GB)	171	161	180	180	180	180	180=1232
3	R. Bailey (GB)	180	170	165	180	180	180	132=1187
4	R. Collins (GB)	56	180	180	180	167	180	175=1118
5	J. Allen (GB)	180	180	180	180	163	–	180=1063
6	K. Faux (GB)	–	180	127	180	142	180	180= 989
7	P. Bond (GB)	158	167	155	–	180	180	140= 980
8	L. Burrows (GB)	–	180	180	170	85	180	180= 975
9	P. Harris (GB)	150	180	58	78	121	180	180= 947
10	T. Grey (GB)	63	180	114	69	126	180	73= 905

(18 entries)

GOLDEN WINGS AEROMODELLER MODEL CLUB

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

JUNIOR CONTESTS AT SOUTH MIDLAND AREA RALLY
Cranfield, September 23rd

Only seven yougsters entered for the Junior Kit competition although the weather was really quite kind. Once again valuable prizes (donated by M.A.P. Ltd.) were available, but not all of these were awarded because of the low numbers actually flying their models.

In Glider, which was restricted to those flying the **Mercury Swan** only two entries were made and one of them was unable to record a score despite brave attempts throughout the day. So the winner was Grahame Moore (age 11) who wisely made just one flight (above 20 seconds) in order to win.

In Rubber where the **KeilKraft Senator** was the chosen design the remaining five people battled it out quite excitingly. Eight-year-old Paul Gaze won with three consistent flights totalling 193 seconds with N. Denton close behind at 188 seconds. Mark Miller (the Nationals winner) was undoubtedly the unluckiest entrant – he made one flight of about 200 seconds and lost his model. As a 180 second 'maximum' was operating he could, of course, claim only 180 seconds for that flight. A second flight of over 14 seconds was all he needed, but without a model it is difficult! The full results were therefore:

Rubber

1	P. Gaze	(8)	193 seconds
2	N. Denton	(14)	188 seconds
3	M. Miller	(8)	180 seconds
4	M. Moore	(13)	155 seconds
5	R. Hobbs	(12)	80 seconds

Glider

1	G. Moore	(11)	79 seconds

Significant points from the results are that the eight-year-olds can clearly show the older ones a thing or two at times! It is also nice to see a new name R. Hobbs having a try.

Well, what about next year? You tell us please. If you don't tell us then someone has to make a decision and it may be one that you do not like – you cannot complain later if you don't speak when asked!

One decision has already been made – the same models (Swan and Senator) will be eligible again next year, even if extra kits are added to them.

★ ★ ★

Things were brighter on the control-line side as the eight entries received was comparatively good for the *Junior Stunt* event and some 400 per cent better than the previous year's turn-out! This made it very encouraging, and worthwhile, for the organisers although it was a pity that three of the entrants had to withdraw before making an official flight – too much practising!

All flew profile fuselaged models (with the exception of a lone combat wing) which shows that 'full stunters' are not necessary – should they even be allowed? As it was, 14-year-old Ian Gray topped the results with a very fine performance from his *Flight Streak* and for his efforts he won a Fox 19, kindly donated by *Irvine Engines*. This incidentally was the most valuable prize presented to *any* contest winner at Cranfield – so come on you Juniors, the rewards are good and the entry fee zero, which can't be bad!

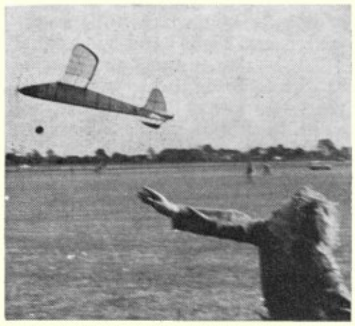
Results:

1	I. Gray	(14)	190.8 points
2	J. Filmer	(14)	174.6 points
3	B. Kenzie	(15)	149.6 points

Winner of the rubber section of the Junior Kit Contest was Paul Gaze, seen here counting the turns he is applying to his Senator.

Another contestant at Cranfield winds the motor prior to making another contest flight. Many of the models produced by these youngsters are very well built and flown to a high standard.

Thirteen - year - old Maurice Moore launches his Senator in fine style but placed no higher than fourth, despite being just 38 seconds behind the winner.



Dear John Bridge,

I am between 10 & 16 years of age and would like to become a member of the 'Golden Wings Club'. With this application I enclose postal order (International Money Order) for 25p to cover cost of the enamel club badge, two coloured transfers and membership card.

NAME IN FULL.....

ADDRESS .....

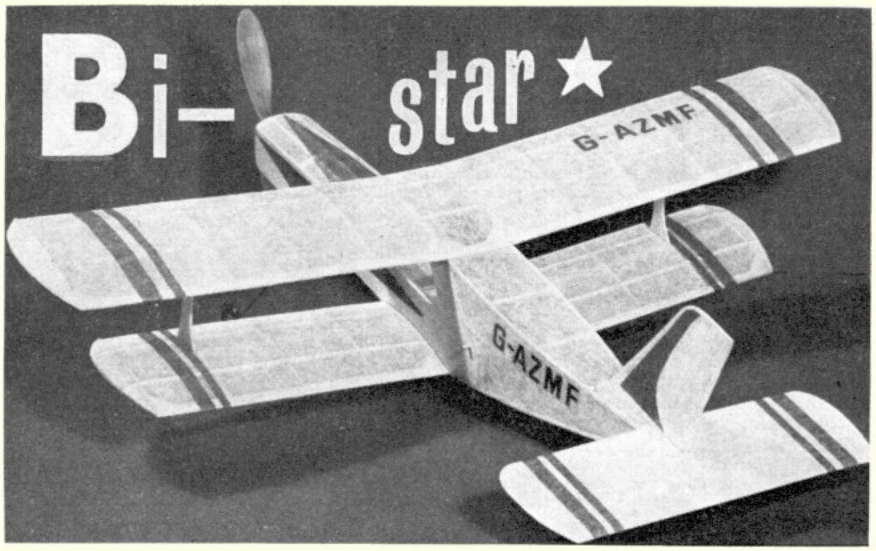
.....

YEAR OF BIRTH.....**SCHOOL**.....

NAME OF ANY OTHER CLUB OR CLUBS TO WHICH I BELONG (if any).....

Send to: **GOLDEN WINGS CLUB, AEROMODELLER, P.O. BOX 35, BRIDGE STREET, HEMEL HEMPSTEAD, HERTS HP1 1EE.**

12/73 15p in the £1 Rebate plan purchase coupon for Golden Wing Members G.W. No. .....



Delightful 18 in. span rubber-powered sportster designed by RAY MALMSTROM

FREE PLAN No 1

ALTHOUGH VASTLY outnumbered by the familiar monoplane, biplanes both model and full-size have an appeal and a glamour all of their own. *Bi-star* is no exception to this and combines the performance of a small duration-type model with the realism usually associated with a semi-scale job. So if you are looking for a bit of glamour (aeromodelling variety! !) then stop right here, and grab that balsa-knife.

Fuselage: Cut out two fuselage sides from $\frac{1}{16}$ in. sheet, noting the former slot shown in Fig. 1. Add reinforcing pieces **A,** rear peg pieces **B** and $\frac{1}{8}$ in. strip pieces at the nose. Lay over plan and build rear section of fuselage from $\frac{1}{16}$ in. square strip, noting change of angle of top longeron at tail end – this is important as the tailplane is cemented to the extreme end of the fuselage and must be at 0° incidence to the centre (or datum) line (Fig. 2). Now construct the master former **C** from pieces cut from $\frac{1}{16}$ in. sheet (Fig. 3). Cement the two fuselage sides to the master former checking carefully that the sides are upright at right angles to the former. Bring the rear ends together and cement. Add all fuselage cross-pieces ($\frac{1}{16}$ in. square) and nose cross-pieces ($\frac{1}{8}$ in. square).

Cut out nose formers **D, E** and **F,** and cement in position, adding the $\frac{1}{16}$ in. square nose stringers. Now add lower nose reinforcing pieces **G.** Bend a length of 20 swg. wire to form the undercarriage (this is best held in a vice) and then firmly bind and cement to $\frac{1}{16}$ in. sheet piece **H.** Place $\frac{3}{4}$ in. diameter lightweight plastic wheels on axles and retain with small pieces of tightly fitting electrical tubing or a blob of cement – as shown in Fig. 4. Cement the undercarriage assembly to fuselage (Fig. 5). Cover top of nose section and rear of fuselage, leaving open the lower rear bay for the tailwheel assembly, and section below rear peg, with lightweight tissue water shrink and give one coat of thinned dope (thinned 50/50 dope and thinner). Add thin cellophane or acetate sheet windscreen and windows. Cut a length of $\frac{1}{16}$ in. diameter hardwood dowel for rear rubber anchorage.

Tailplane-fin assembly: Cut tailplane and fin from $\frac{1}{16}$ in. sheet and lightly sand round the edges. Give each a coat of dope, thinned as before, pinning the surfaces to the building board while drying to avoid warps. Cement fin into tailplane fin spot-check that fin is upright. Cement tailplane-fin assembly to fuselage. Check that tailplane is at 0° incidence to centre (or datum) line. Add fairing pieces **K** and **L.** Bend tailwheel leg from 20 swg. wire. Cement to $\frac{1}{16}$ in. piece **J** and reinforce with two layers of doped tissue. Cement tailwheel assembly into lower rear bay of fuselage.

Noseblock-propeller assembly: Cut pieces **M** and **N** from $\frac{1}{4}$ in. sheet, then cement together and sandpaper piece M to profile shown. Drill accurately to accept a length of brass or aluminium tubing for the 18 swg. prop shaft. Reinforce front and rear with small discs of 1/32 in. plywood. *Bi-star* uses a *Veron* 6 in. diameter ready-carved balsa propeller (obtainable from your model shop, or contact Messrs. Veron for nearest supplier). These efficient balsa propellers only need a little sanding of the blades, and three coats of clear dope. Carefully drill the centre hole and reinforce with a length of brass or aluminium tubing. Form the propeller drive shaft from 18 swg. wire, insert through noseblock, add two cup washers, and freewheel as detailed on plan. Note the down thrust angle. Apply a spot of oil to prop-shaft for free running – this is important.

Wings: Both upper and lower wings are built in exactly the same way – a left- and right-hand wing panel and a centre section. Cut 14 ribs (upper) and 12 ribs (lower) from 1/32 in. sheet. Build both wings and centre sections over plan – note that the root ribs are angled. Set these ribs with the aid of jig piece **S** shown in Fig. 6. Assemble wing panels to centre section, pinning centre section to board and using dihedral pieces **T** and **U.** (Fig. 7). Cover the wings with lightweight tissue, water shrink, and dope with 50/50 dope and thinners, pinning each panel separately to board to avoid warps. This is important.

Now cement top wing in position on fuselage. The

Continued on page 705

DH PUSS MOTH

An 18½ in. span rubber-powered scale model by our scale columnist ERIC COATES

BEFORE, during, and just after the last war, the *Puss Moth* was probably the most popular subject for a scale rubber powered model. Several plans, of varying scales, were published and quite a number of kits were marketed by a variety of manufacturers all, alas, now fond and distant memories. The most popular scale was ½ in.=1 ft. (1/24th). Examination of photographs of these old models, however, reveals that in many cases the designers took considerable liberties with the outlines of the *Puss* and virtually all paid scant respect for a scale structure.

In my model, the first rubber-driven scale model I have ever designed, I have tried to incorporate as near to a scale structure as possible, utilising some of the techniques evolved over many years of powered scale model designs, but also freely 'crib-

FREE PLAN No 2

bing' methods employed by the acknowledged expert on this class of model – Doug McHard. The tail surfaces, however, are slightly enlarged from true scale and a small amount of dihedral is incorporated – this latter modification I personally feel is an improvement in the appearance of the full sized Puss; which always gives a droopy appearance with its dead flat wings! The wing section is also flattened on its lower surface to make for easier building and slow the flying speed down a bit.

I am indebted to Vivian Bellamy, G.P., of the nearby village of Botley, Hants, who allowed me to crawl over G-AEOA to measure and take photographs. Dr. Bellamy virtually rescued G-AEOA from the scrapheap in the 1960s – completely remaking the wooden wings and tail structure which had rotted with the ravishes of time.

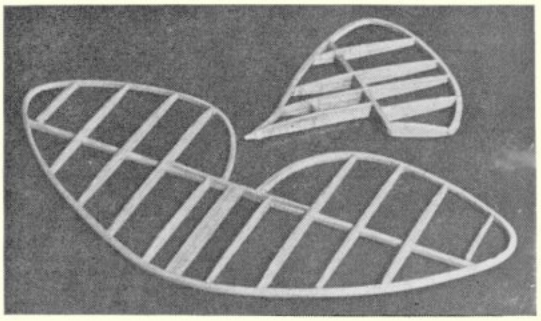
Although the model is no beginner's project it is not difficult for those with a delicate touch. If you have built nothing but R/C models for years though and fancy having a go I would suggest an intermediate model such as a Keil Kraft *Senator* or *Ajax*; just to get the feeling for light scantlings again. Because there is rather more structure than is usual on a scale model of this size, care must be taken in selecting the lightest possible grades of balsa to do the job asked of them.

Fuselage

Start with the fuselage, which is the simplest part. Two basic fuselage sides are made from medium-hard 1/16 in. square. Omit the stringer along the fuselage centre line at this stage (see sketch 1). I recommend PVA as an adhesive for most of this model, to eliminate structural warps. Cut out the fuselage formers F1 to 4, then join the two basic sides with formers 3 and 4 and fit all the intermediate cross braces between them (see sketch 2). Crack the longerons at former 3 and join at the nose with 1mm. ply former 1. Join the longerons together at the tail. Add formers 2A, 2P and 2S and the 1/16 in. sheet tailplane platform. Fit the remaining cross members followed by the centre line stringers – note these are carried over the cross members aft of former 3 but are flush forward of this point. The top and bottom stringers are now added; they are of a softer grade of balsa to allow them to bend edgewise on. The lower part of the U/C is now formed from 22swg wire and epoxied to the appropriate cross members. The fuselage structure is completed by adding the 3/32 in. sheet cowl bottom and wrapping 1/32 in. sheet round the nose between formers 1 and 2. This process is facilitated if the outer surface is thoroughly soaked first – licking is the best way of achieving this!

Tail surfaces

The secret of making a good job of the tail surfaces lies in the outlines. The sheet segments, beloved by the kit manufacturers, I find hideous, therefore I recommend everyone to have a go at laminated outlines. As many regular readers know I usually fabricate my tail structures on a centre core of 1/32 in. sheet but on a model as small as this such a structure would be far too heavy. I still use a centre core for the construction of the outlines though. Cut templates from 1/16 in. sheet to the exact shape of



the *inside* contour of both the tailplane and fin then rub a candle round the edges. Cut several strips from 1/64 in. sheet (or 1/32 in sanded down) 1/16 in. wide. Thoroughly soak these, then wrap round the contour of the template – pinning where necessary. Apply PVA to the outside and apply a second strip. Repeat for a third strip and then put aside overnight to dry. When removed from the template after drying you will be surprised at the rigidity of the contour.

The tailplane is then constructed conventionally, the ribs being made from ⅛ in. strips of soft 1/32 in. sheet. Sand to contour after assembly. The fin is a little more tricky as the 1/16 in. square spar passes through the centre of the ribs. The fin post is formed by adding extra 1/16 in. sq. to either side of the spar up to the third rib.

Wings

The tips are produced over a template in a similar manner to the tail contours just described.

Three rib templates are required: 2 off R1 and 1 off R2. All ribs are from the lightest quarter grain 1/32 in. sheet. Eight off R1 are made for the inboard parallel portion of the wing. The root rib is merely a strip of ⅛ in. x 1/16 in.; the tapered ribs are produced 'block' fashion – 9 pieces of 1/32 in. sheet sandwiched between R1 and R2. The main spar and L.E. slots are cut in the ribs 'en masse' by means of a 1/16 in. diameter drill and a Swiss file where the trailing edges of the outer four ribs are individually modified to suit T.E. structure. The tip rib is fitted as a piece of 1/32 in. x ¼ in. strip, sanded to contour, in situ, after the tips are fitted.

The T.E. is pinned down to the plan, and all ribs slotted into the 1/16 in. x 3/16 in. spar and spaced at their correct stations. The spar is then pinned to the plan and the T.E. glued to the ribs. The L.E. is then slotted in and glued to the nose ribs – note both the L.E. and T.E. have scarf joints in them. The preformed tips are now attached to the L.E. and T.E. and the leading edge is now sheeted on the upper surface. It is recommended that the contour is preformed by coating the inside face with balsa cement and allowing to dry before attaching to the ribs. The L.E. inboard of the last R1 is blocked in. The whole structure is now lightly sanded.

Prop Assembly

The propellor is carved from a block of light balsa. If the blank shown on the drawing is worked to and undercamber is incorporated an efficient propellor, of only 4½in. diameter, will be produced. It won't be very scale like in appearance but it will produce the required power for about a 30-40 sec. run. A commercial plastic prop is useless for this model. The noseblock is carved from soft balsa. The journal bearing is 18 swg brass tube epoxied in place with 3° downthrust incorporated and the 18 swg prop shaft incorporates a free wheel – a thrust race is preferable to a couple of cup washers. The noseblock is located into former 1 with a 3/32 in. sheet spiggot.

Covering

On the original the fuselage was covered with red lightweight Model-span, the flying surfaces with white Jap tissue, using thinned dope as the adhesive. The covering was water shrunk and given one coat of thin clear dope.

Final Details

The cabin is covered with very thin celluloid. Take a postcard and dope it aluminium on one side, then cut into strips with a balsa knife and glue them over the celluloid, with impact adhesive, to represent the aluminium framing. Wing struts are made from ⅛ in. x 1/16 in. balsa. Colour dope was used only on the sheeted nose and the struts, on the original, to keep the weight down, registration letters being cut from heavyweight black Modelspan tissue doped on. The fuselage registrations were outlined in white ink while the upper surfaces of the wing tanks were represented with white paper. The control surface hinge lines were done with a lining pen containing thinned grey dope.

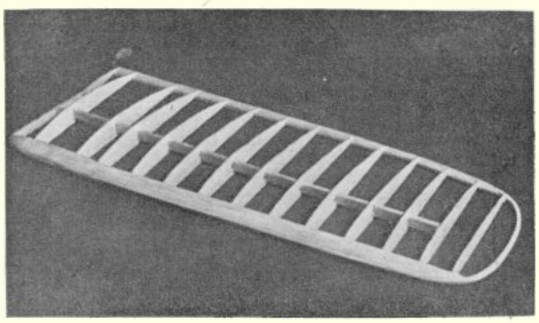
Assembly

The whole model is assembled using balsa cement. Nothing knocks off as with a light model such as this one can fly into obstructions with impunity. For trimming purposes, however, I would recommend that the fin be attached to the tailplane but that the latter be held to the fuselage with rubber bands.

Flying

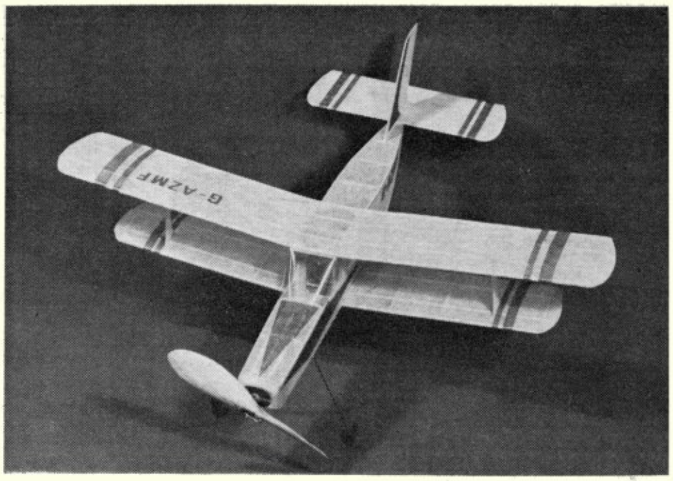
The model was designed for indoor flying in large hangars, though it will fly very well outdoors on a calm day. I would recommend in any case that trimming is carried out in the open over grass. Insert the motor and pretension. Ballast the model with plasticine to the C.G. position shown on the drawings then adjust rudder angle and tailplane incidence until a long straight glide is obtained.

Apply about a hundred turns and launch. Adjust the thrust line, by packing the nose block, until a straight flight with a slight turn to the left is attained – increase the number of turns slowly so that a left climbing turn is achieved. Using 1/32 in. Pirelli, 600 turns are about the normal maximum. For hangar flying aim to make the model turn in about 60 ft. diameter circles; climbing to about 40 ft. maximum the glide should be in wider diameter circles still to the left. When this has been achieved the tailplane can be glued permanently to the fuselage and any subsequent trim changes can be achieved by warping the tail surfaces and ballasting.



BI-STAR

Continued from page 702



Looks good, doesn't it! Model is easy to build – in fact, it was designed for 'less than expert' fingers – and flies a treat. No need to carve a special propeller either, it uses a standard Veron prop, available from most model shops. A biplane makes a welcome change from the usual run-of-the-mill model too – give it a try and see for yourself.

lower wing fits into a cut-out on the sheet fuselage side – be very careful when assembling the lower wing to make sure that the undersurface of the wing centre section is flush with the fuselage undersurface. You may have to sandpaper the cut-out in the fuselage slightly to achieve this. It is important, as this flush-fit gives the lower wing the correct amount of positive incidence. Take care over this please – and avoid a fit of depression later! Finally cut two interplane struts **V** ($\frac{1}{16}$ in. sheet) dope, and cement in position, making sure you do not twist the wing panels when fitting. That completes *Bi-star's* construction. Not too nerve-wracking was it?

Balancing: This is a very simple – but very important – part of the proceedings, and one that many of us, in our eagerness to get out for that first test-flight tend to skip! Before balancing, take an 18 in. length of $\frac{1}{4}$ in. wide flat rubber strip, and tie into a loop. Lubricate and install between the drive-shaft hook and the rear dowel anchorage. Now place the tips of your fore-fingers under the upper wing tips at the points indicated on the plan – your *Bi-star* should balance level, but it is possible that you may need a little nose or tail weight to achieve this correct balance. However our original model needed no additional weight at all.

Flying: Test glide over long grass in calm conditions. From a shoulder-high launch, *Bi-star* should touch down 23-50 ft. ahead of you. Obtain a **straight** glide. Slight adjustment to the rear edge of the fin should correct any tendency to turn right or left. A vicious turn indicates warps or bad alignment of the flying surfaces. With a satisfactory glide achieved, you can use the short test motor for a power-on hop (the test motor, well lubricated will take about 150-200 turns). *Bi-star* should climb away from a steady launch, level-off and settle into a shallow glide. You may need a $\frac{1}{16}$ in. packing strip inserted on the left hand side of the noseblock to overcome torque. If all is well, discard the test motor and install the flight-motor – 32 in. or $\frac{1}{4}$ in. wide flat rubber strip, made into a 16 in. loop (or alternatively 64 in. of $\frac{1}{8}$ in. wide flat rubber strip made into two loops – four strands). Well lubricated and 'run-in', motors should take about 650 turns. Our best flight on test was 54.9 secs. Anyone for the minute? Good luck – and happy landings with *Bi-star*!

FLYING SCALE COLUMN

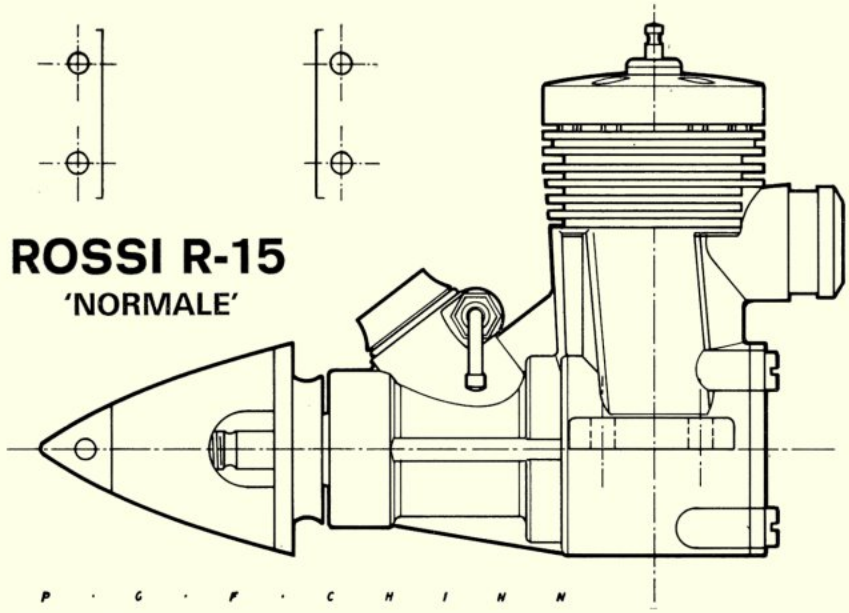
Continued from page 683

I was one) alike. The event was hardly oversubscribed. The two panels of four judges, marshalled by the S.M.A.E., outnumbered the prospective team members by two! Because the date and exact venue, other than vaguely 'Eastern U.S.A.' was at the time still unknown, the event was not a true Trial in that competitors were not required to sign a declaration that if selected for the team from the results, they would be willing to travel to the Championships at their own expense. Possibly the prospective expense deterred all but the keenest!

A competition was not really required in Control Line as there were only three competitors – Mick Reeves flying his *Zlin 526*, repaired after the prang at the 1972 World Champs., at Toulouse, Horace Venables with his *Fokker EV* and Mick Staples flying his *Avro 504K*. Four competitors necessitated a competition(!) in Radio Control. Terry Melaney flying his superb *Moth Minor*, as well as ever, topped the results as expected. Jack Sheldon flying his *Nipper* not nearly so well, attained second place. Mick Reeves flying his *Cassutt* somewhat erratically, due to a faulty transmitter, managed to edge Tony Lunt and his *Fokker Dr.1* out of third place. The *Fokker* looked superb in the air but, as Tony would be the first to admit, it is a good Class 2 model and was, therefore, not in the same class as the other three in the static judging. So, if as is probable, the first three are selected for the team, Mick Reeves will be flying in both classes again as in 1972.

Results.

		Flight	Static	Total
Control Line				
1. M. Reeves	*Zlin Trener 526*	1378	1641	3019
2. H. Venables	*Fokker EV (D.8)*	1044	1773	2817
3. M. Staples	*Avro 504K*	571	1547	2118
Radio Control				
1. T. Melaney	*D. H. Moth Minor*	1840	2048	3888
2. J. Sheldon	*Fokker Dr.1*	1646	1072	2718
3. M. Reeves	*Cassutt Racer*	1228	1621	2849
4. A. Lunt	*Tipsy Nipper*	1261	1917	3178



ROSSI R-15
'NORMALE'

ENGINE TEST

Latest version of Italy's most powerful 2.5 c.c. engine, reviewed by PETER CHINN

P · G · F · C H I N N

IT IS ONLY ten months since the Rossi 15 was first dealt with in the A.M. Engine Tests, but the interest in this World Championship winning engine is such that we felt bound to bring the situation up to date by running a further report, this time on the current version for which the manufacturer has claimed an even higher power output than was achieved with the 1972 model.

Once again, the unit submitted for test was the standard or 'normale' (i.e. non-pipe) version that has become recognised as the *only* motor to use at the present time if one expects to achieve any sort of success in international class free-flight power events.

The modifications that have been made to the present model consist mainly of a larger diameter crankshaft journal, a larger rear ball-bearing, later rotary-valve closure, modified cylinder port timing and (the only outwardly visible difference) slight changes to the main casting in the vicinity of the lower cylinder fins.

To take the casting first. This has been modified to add more metal externally to the lower part of the finned section between the transfer passages and where the exhaust stub joins the cylinder casing. This also increases the area of the lower fins which now completely surround the cylinder except where interrupted by the exhaust. In addition the case is fractionally higher which, in conjunction with the absence of the 0.2 mm. head gasket, reduces the gap between the top fin and the cylinder head.

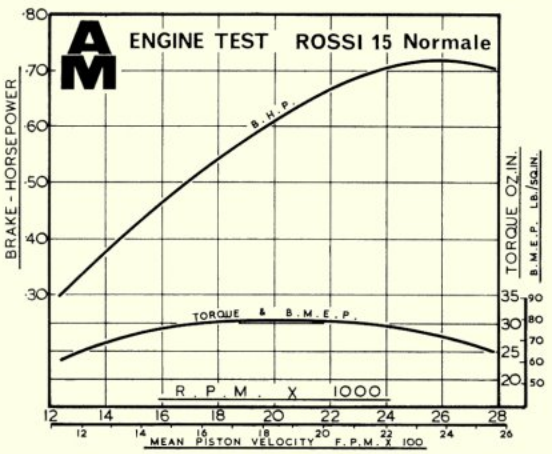
Internally, the case is machined to make the larger o.d. rear ball bearing necessary to support the new crankshaft. The shaft has a 10.5 mm. (instead of 10 mm.) main journal and this has allowed the valve port to be widened to extend the induction period. Measurement of the test engine indicated a rotary-valve timing of 41 degrees ABDC to 62 degrees ATDC. This compares with a 39-47 degree period measured on the earlier engine. The large valve port is, of course, rectangular and, as before, registers with a slightly offset, parallel-sided bearing aperture, to assist gas flow and give rapid opening and closing. The machined intake venturi, with its six peripheral jets, is unaltered and has a 6 mm. throat for an effective choke area of 28.3 sq. mm.

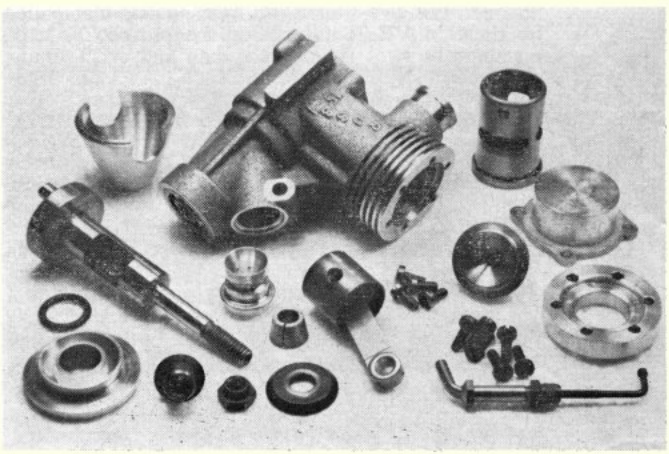
Cylinder port areas and shapes remain virtually unchanged (the third port is just a trifle deeper) and the measured exhaust period, at 152 degrees of crank angle, is not significantly different from the (150 degrees) of the previous model but the main transfer period, at a measured 136 degrees, is open for six degrees longer than before and the third port, which previously opened two degrees later, now opens simultaneously with the main transfers for a 10 degree longer period than before.

The craftsmanship exhibited in the construction of this engine continues to be of a very high order.

Performance

Right from the beginning, the handling characteristics of our R.15 were impeccable. Nowadays, ultra high performance does not automatically mean tricky





or vicious handling qualities (the latest K&B racing 40 is another engine that demonstrates this) and we can honestly say that the hand-starting qualities of the Rossi were better than some so-called 'beginner's' diesels we have handled. Admittedly, many contest flyers prefer to use an electric starter on the R.15, rather than expose their fingers to the risk of cuts from the sharp blades of a glassfibre prop and, for convenience, we also used a starter but for anyone who does not want the bother of carrying around a starter and battery, a rubber finger stall will make a tolerable substitute so far as the Rossi 15 is concerned.

Rossi Brothers' current recommendations regarding running-in the R.15 call for 25 minutes bench running on a 3 to 1 methanol/castor-oil mix using a 7½ x 3 in. prop, followed by a further 60 minutes bench running on the same fuel with a 7 x 3 prop. Clearly, the latter is intended to ensure that the engine is fully freed up at its peak. At this stage, in fact, our motor turned a TopFlite 7 x 3 in. at 26,600 r.p.m. – 1,200 r.p.m. faster than the earlier engine tested.

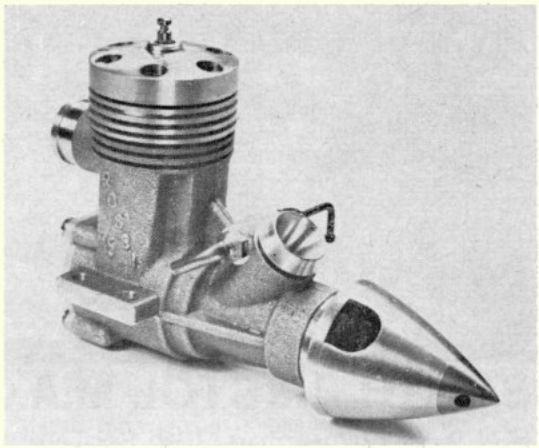
The manufacturer's claimed power output for the R.15 *Normale* is now 0.75 b.h.p. at 25,000 r.p.m. (and, incidentally, 0.90 b.h.p. at 28,000 r.p.m. for the piped version) and we got very close to this with a figure of 0.72 b.h.p. at a slightly higher (26,000 r.p.m.) peak. This seems to tie in quite well with the 7 x 3¼ in. Bartels epoxy-glassfibre prop used by many contest flyers. Our motor turned a stock example of this prop at 24,400 static which would suggest that, already so close to its maximum power output, the engine would quickly unwind to just beyond its peak when the model is launched and thereby rapidly accelerate the model to its maximum climbing speed. One hears of some continental F/F exponents running their R.15's at 25,000-26,000 r.p.m. static, so one hesitates to suggest props that would hold the Rossi to very much lower static r.p.m. but, just for the record, our test sample turned a 7½ x 3¾ in. Bartels at 22,200 and a 7 x 4 in. Power-Prop at 21,400. For the benefit of those who might care for a tentative essay into the world of C/L speed without the complication of a tuned pipe, it may be worth mentioning that our Rossi turned a 6 x 7 in. (Top Flite pattern) Bartels at 20,200 and a 5¾ x 8½ in. Bartels-Moki at 20,800. Going farther down the scale to what was once considered a normal size prop for FAI free-flight, an 8 x 4 Taipan nylon-glassfibre was turned at 17,800, while a 7 x 6 in. Bartels rotated at 17,100.

This really represents the limit of the Rossi's usefulness *on FAI fuel, at least*. Under still heavier loads, torque now drops off rapidly, power output then becomes inferior to that of much less exotic designs and the engine begins to run unsteadily.

The message is loud and clear: Don't buy a Rossi unless you are going to use it for the purposes for which it was designed – or unless you are prepared to part with £34 just for the pleasure of owning one. But if you aspire to FAI competition success, the answer is simple: you just have to have an R.15.

Power/Weight Ratio (as tested): 2.00 b.h.p./lb.
Specific Output (as tested): 291 b.h.p./litre.

Footnote: In accordance with FAI regulations for the 2.5 c.c. World Championship class, straight methanol/castor-oil fuel was used for all our tests. However, for events where doped fuels are permitted the Rossi brothers approve up to 70 per cent nitromethane provided that the engine is first given adequate running-in on straight fuel and provided that the nitro content is then introduced in gradually increasing quantities. A reduction in compression ratio is recommended with nitro fuels and can be easily effected by fitting one or two of the aluminium head gaskets available for this purpose. It may also be necessary to use a different glow-head from the No. 2 type fitted as standard. Glow-heads are now obtainable in four grades. No. 1 *calda* (hot) and No. 2 *media* (medium) for FAI fuel and No. 3 *fredda* (cold) and No. 4 *molto fredda* (very cold) for nitro fuels.



SPECIFICATION

Type: Single cylinder, aircooled, glowplug ignition Schnuerle loop scavenged two-stroke with crankshaft rotary-valve and twin ball bearings.
Bore: 15 mm. (0·5905 in.)
Stroke: 14 mm. (0·5512 in.)
Swept Volume: 2·474 cc. (0·1510 cu.in.)
Stroke/Bore Ratio: 0·933:1
Checked Weight: 163 grammes (5¾ oz.), including spinner assembly.

General Structural Data

Sandcast aluminium alloy *crankcase/cylinder-casing/front housing* unit. Detachable rear *crankcase-cover* secured with four screws. Hardened steel *crankshaft* with full disc internally-counterbalanced crankweb, 10·5 mm. o.d. main journal, 7·5 mm. i.d. gas passage and 4·5 mm. o.d. crankpin. Shaft supported in one 10·5 x 21 mm. 8-ball steel caged ball journal bearing at the rear and one 6 x 16 mm. 6-ball brass-caged ball journal bearing at front. Flat crown deflectorless lapped cast-iron *piston* running in hardened steel *cylinder liner*. 4 mm. o.d. hollow *gudgeon-pin* located by circlips in piston. Machined aluminium alloy *connecting-rod*, unbushed, but with oil holes at both ends. Two-piece machined *cylinder-head* assembly consisting of trumpet-shaped combustion chamber insert having integral ignition filament and a separate outer ring securing complete assembly to main casting with six screws. No head gasket. Machined aluminium alloy *prop. driver/spinner-backplate*, mounted on shaft via aluminium split taper collet. Machined aluminium alloy *spinner shell*. Steel spinner *nose-cone* securing spinner assembly to shaft. Machined aluminium alloy *venturi insert* with 6 mm. i.d. choke and retained by tangent mounted needle-valve assembly feeding fuel to six peripheral jets in venturi.

TEST CONDITIONS:

Running time prior to test: 1½ hours, approximately.
Fuel used: 75 per cent methanol, 25 per cent Duckhams Racing Castor Oil.
Glowplugs used: Rossi No. 2 glowheads as supplied.
Air Temperature: 23 deg. C (73 deg. F).
Barometric Pressure: 30·05 in.Hg.

SOUTH BRISTOL M.A.C. GALA

R.N.A.Y. Wroughton, 30th September 1973

THIS YEAR'S GALA was marred somewhat by a cold strong wind and a rival attraction 'up North'.

Free-Flight activity was sporadic but intensified during the afternoon, flights going far but into open country. Power glider were won by full houses from Derek Wain and Pete Stewart. Chuck Gliders, being able to survive the conditions with impunity, drew quite a good entry and a closely fought contest.

In contrast, Rubber had but two fliers! The South Bristol *forte*, Vintage Precision, was fairly well supported, the winning machine, a little Veron *Sentinel* had quite a history. Built by Jon Clemens in a tent in Africa within sight of Victoria Falls, it was 100 per cent kit construction, and travelled back to England in the cockpit of an airliner, courtesy of a sympathetic pilot!

Thermal Soaring attracted a good entry and the conditions certainly tested the operators skills to the full. Many large machines were in evidence as against last year's medium-sized crop, eventual winner being Dave Dyer.

The control line Combat event was a late inclusion, and had a reasonable entry the eventual final being between Richard Evans and Mick Tiernan, whose models were strapped together with Sellotape at this stage, and was held in very gloomy conditions. Interesting was the use of the F.A.I. re-circulation of knocked-out fliers rules which gave all more flying and thus a more interesting contest.

Results:
Open Power. 1. D. Wain (B & West) 9:00, 2. J. Hook (Southampton) 7:15, 3. A Comfort (S. Bristol) 5:59 **Open Glider.** 1. P. Stewart (Crookham) 9:00, 2. A. Jack (Southampton) 7:33, 3. G. Madelin 7:11. **Open Rubber.** 1. R. Cummins (B & West) 7:02, 2. P. Uden (Maidenhead) 2:33. **Chuck Glider.** 1. B. Silcocks (S.B.) 3:08, 2. J. Tipper (Lee Bees) 3:07, 3. R. Cummins (B. & West) 2:57. **Vintage Precision.** 1. J. Clemens (B & West) 0.85 per cent Error, 2. J. Mayes (S. Bristol) 3.00 per cent Error, 3. R. Greenslade (S. Bristol) 7.00 per cent Error. **Combat.** 1. R. Evans (S. Bristol), 2. M. Tiernan (Leicester), 3. D. Dowdeswell (Glevum). **Thermal Soaring.** 1. D. Dyer 8.35, 2. P. A. Clarke 791, 3 N. Webster 772.

Top left, Dave Dyer looks pleased with his trophy for winning the thermal soaring event. On his right is G. Stowell with his O & R 60 spark ignition-powered KeilKraft Falcon which he flew in the Vintage event. Top right is J. Clemens of Bristol and West who flew this Veron Sentinel to first place in Vintage Precision – with less than 1 per cent error! At left, a good turn-out from the Maidenhead combat fliers, although they failed to place in the final results.

Left, Open Power winner D. Wain used an O.S.19 in old model. At right is Richard Evans who won the combat event. Far right is Open Rubber winner R. Cummins.

CLUB NEWS

PERHAPS the most graceful, least complicated form of model flying is the free-flight glider; it is also the least expensive. Moreover, it provides the ideal introduction to model flying as well as being highly rewarding at all levels of expertise. These facts have been known to generations of modellers, and certainly not ignored by the present one, if the 40 team entry in the S.M.A.E., *Model Engineer Cup* for A/2 glider is anything to go by.

The September bulletin of the **Leicester M.A.C.** discusses the hoary question of how to time a ten second engine run. Appears a member was involved in timing a marginal case at the Strubby meeting. Sound can be pretty indistinct, particularly in a wind, and it has a time lag; you just cannot see the propeller at present day altitudes; and transition from power to glide is often so smooth that model attitude is not a determinant. Who'd be a timekeeper? Obviously what is required is some sort of electronic gadget to bridge the human fallibility gap. The newsletter carries an appendum giving a full run down on what the club is all about, covering history, rules, constitution, etc. Quite an organisation.

What will we be flying in 2073 A.D.? White integral wings, you might say, if we're good, but according to **Three Kings'** *Court Circular* we'll still be flying models – but in an even more alarming way; a sort of souped up vintage with Dr. Who overtones. Not a serious prognostication; just a bit of club humour. Well in the realms of reality, though, is a piece of souped-up vintage by Geoff Burkett. It is an *Avro Lancaster,* 6 ft. 5 in. in wingspan. It has working flaps and a third line controls four E.D. 3.5 c.c. Hunter diesels. Must take some holding on the line, and even more so on a Mini roof rack. Naturally the *Model of the Month.* Another super scale job to grace the Three Kings' clubroom is the *Bristol MID* featured on the cover of the October *Aeromodeller.* Jack Jansen, the builder of this and many other large scale projects, was found to be living on the club doorstep, figuratively, of course. Club members got the chance of seeing how well their Scale jobs shaped up nationally at the S.M.A.E. 'All Scale Day' at Rissington. Derek Goddard's *Airspeed Oxford* scored high on both static and flight to get a well deserved third place.

Tactical flying may be a nuisance, but does non-tactical flying prove anything? At a Topcliffe Open Glider meeting held in August, and reported in Ron Firth's *Model Aeroplane Gazette,* there was no hanging about for the bubbles to rise or the cheek to glow; it was straight off the launch point into come what may. Weather was gusty and the max cut down to 1 min. 45 sec. (cornfield conservation). Only two flyers aggregated 7 min. into the fly-off, and no doubt this could have been improved upon tactically. In a Rubber event, held at the same time, the max time was again made adjustable to the conditions, and flights were confined to three 15 minute periods, spaced at hourly intervals. Theoretically, a max flight should land inside the airfield, thus obviating those scouring searches over the surrounding countryside. Personally, I would like to see this latter form of contest succeed; the 3 min. max in poor conditions leads to too many lost models and much trespassing. Question: When is a vintage model not a vintage model? Answer: When it is a kitted up version of the original design – or rather the kit plan. A letter in the newsletter draws attention to a whole host of discrepancies which exist between Bob Copland's original *Northern Star* plan and that of the kit. From a purist point of view the original is to be preferred, but as both come from the same vintage year, 1938, I rate them as equally authentic.

Hardly is summer over than we are thinking about winter galas. Announcing theirs for January 13th, the **East Anglian Area** is to make two combined R/G/P events of it, Open and F.A.I. That is on the F/F side, but there is also to be Novelty R/C and a C/L event. The Area newsletter reports on the 5th Area Meeting at Watton. As usual the Norwich and Anglia clubs turned out in force, and quite a bevy of Power models took the air for the Team Power event, Norwich fielding two teams. Anglia, who have now assembled quite a strong power faction, knocked up the highest aggregate, with Bob Wells, more noted for his Wakefields, putting up the highest time: 3 maxes plus a 3:30. Some nice plans in the current issue; not so much for building from as for expert appraisal. Like Chinamen, Wakefields look very much alike to the outsider, but there is a wealth of variation to be seen by the cognoscenti.

What should a club newsletter contain? That is the question discussed in the **Aylesbury & D.M.F.C.'s** *Concorde.* The view of Pete Richardson is that it should be the basis of an exchange of information on engines, new kits etc., and not so much a news-sheet for people who do not attend club meetings. If only club members generally would spend a little of their hobby time in setting down some of their findings and experiences the club newsletter would, I believe, play a much more vital part in club life than it does now. It really is a pity that so many newsletters, originated with high enthusiasm, should go into desuetude through lack of contributions. A problem in these times of great diversity is to promote events that will have a wide appeal across the whole membership spectrum. Aylesbury has found one at least; duration contesting with *Sky Streak* snap-together-and-fly rubber models. Top time seems to be 13 seconds. Chuck gliding, also popular in the club, is a togetherness activity; easy to produce models and simple contest schedules. Thoughts are now hovering around the one-off kit contest. A letter in the bulletin refers to an article on aeromodelling which appeared in a popular magazine. He did not go much on the punch line, *'Every enthusiasts dream is a plane that he can command at will by radio'.* Maybe this is true of 75 per cent of model flyers today. Many newcomers to the hobby cannot imagine anyone taking to the sport other than to enjoy the thrill of remote piloting but might be worth mentioning that radio flying does not suit all temperaments. It is a very exacting pursuit, imposing those strains and anxieties that accompany high thrill activities. People of a nervous disposition etc. . . .

Chief aim of the 'Flying Kestrels' club of Kenilworth is to teach their members to fly radio-controlled models properly and safely – excellent sentiments, and ones well worth pursuing by other groups. Wide variety of models evident, which we are informed have been suitably 'beefed-up' to withstand the rigours of landing on a none-too-smooth flying field! Interested parties should contact the P.R.O. address given in text below.

Whereas free flighters in this country tend to restrict contest schedules to very few events, trans-atlantic meetings appear to have quite a generous spread of events. Too many I would say for the rather thin entry of 87 in the 1973 N'West F/F Champs held in August. No less than 14 events are listed in the *W.M.C. Patter* result sheet. What expands the contest schedule is the high number of Junior events. We in this country do not separate the men from the boys on the flying field; when someone is old enough to take up the contest challenge he has become of age.

We have a report from Mr. R. Wilson, who is the Consultant & Liaison Officer of the Hadfield Centre, of a Rally held by the **Derbyshire Radio Operated Model Engineering Society** on September 16th. The weather on the day began threateningly but resolved into shirt-sleeve order. A good crowd turned up to enjoy some excellent flying. Ray Slack won multi aerobatics, with Derek Brunt second, and E. Birch flew a *Morane Saulnier* into first position in the Scale event. Wally Nield was runner-up with his *Gypsy Moth*. Next year the Hadfield Group are going to put on an exhibition flying and static display, with prizes for best models, and **Parkway M.F.C.,** is to lay on an exhibition and bombing display. Anyone interested in adding to the fun should contact the Warden, Hadfield School & Centre, Hadfield, Nr. Glossop, Derbyshire. Splendid facilities are provided for the clubs in the group, and membership extends even into the top echelons of the model industry.

Barry Clay, the P.R.O., of the **Flying Kestrels** of Kenilworth, states the aim of this Warwickshire group very succinctly: to teach members to fly radio models properly and safely. Instruction is held every Sunday with standard *Ventura* trainers. Mr. Clay goes on to tell us that the club is an offshoot of the Midland Aero Club, formed back in 1909 as a model group. The flying field is rented pastureland, where the accent is very much on safe flying and tidy behaviour. Certainly for radio flying these private pastureland sites are ideal; isolated from houses and free from public incursion, the whole area can be effectively controlled and 'policed'. All the year round flying, and membership still open. If interested in this very happy group, write to Barry Clay at 1 Copland Place, Tile Nill, Coventry, Warwickshire. In the accompanying newsletter, *Kestrel Circuit*, there is a proposal to introduce a simple flight test to ensure that a flyer is capable of handling his machine with the proficiency necessary for flying near the public. He could perhaps receive a set of wings or a certificate as proof of his capability.

From Monmouthshire comes news of the founding of the **Cwmbran Modelling Society.** According to the letter we have had from Mr. G. Jones, the Hon. Sec., all types of models are catered for, with particular emphasis on aircraft and boats. Negotiations are in hand with the local council for a flying field and boating lake. Membership already stands at 25, and anyone interested should write to Mr. Jones at 56 Oakfield Road, Cwmbran, Mon., or telephone the Hobbies Shop, Cwmbran 66727.

Lucky **Northampton M.A.C.** They have just moved back into their refurbished club room. New lighting and power points are there to assist the club building programme, and a start has been made on a *Caprice* and the inevitable *Warlords*, F/F and C/L appear to be the main club interests and contests in these classes are run throughout the season, with an overall Individual Championship award. A note in the newsletter about the itinerary of Chairman, Howard Boys. He did a tour of the modelling centres of Europe on his trusty old motor-cycle steed, known as *Villian*. He covered 4,800 miles at a very modest cost.

What has happened to the wide open spaces of California? The **San Diego Orbiteers** are still looking for a patch to alight upon. It does seem odd that clubs can find flying space in our overcrowded island, but not in the places where Europeans migrated in search of lebensraum.

Would like to see a few more reports. What about it, you P.R.O's?

Clubman

CONTEST CALENDAR

November 25th **ST. ALBANS M.A.C. WINTER GALA.** Open R/G/P, Cd'H, A/1 and HLG (John Simeons Trophy for Power). Chobham Common, 10 a.m.

December 2nd **FALCONS GALA.** Open R/G/P at Chetwynd.

CLUB SECRETARIES:

Please forward details of your forthcoming contests or rallies as soon as possible to avoid duplication of dates and/or interests in next season's Calendar. Items for insertion in the Calendar must be received at this office by the 20th of the month, for publication in the next immediate issue. Details should be brief but explicit, and include exact location of venue.

New Edition!

PLANS HANDBOOK 1

Aeromodelling

Free Flight, Control Line, Scale, Unorthodox, Sports

Completely updated 1973/4 edition of the ever popular plans handbook has 128 pages packed with hundreds of model designs illustrated and described with pertinent data plus grading for ease of construction, Novice or expert can select his model building programme from gliders, rubber driven, power models, unorthodox; all types of control line or free flight; scale or duration; even vintage or waterplane. Whatever your interest in model planes, provided it's not radio control (for which you need Handbook Number 4), you'll find your next model subject in this unique book. Tabulated data on engines, useful features on trimming for free flight, finding the Centre of Gravity, handling rubber motors, using balsa wood, covering, plastic moulding, and complete indices to scale plans all illustrated designs and the famous 'X' list of old favourites make the plans handbook essential for all aeromodellers.

At your local model shop or direct (post free) 20p from

MODEL & ALLIED PUBLICATIONS LTD.,
P.O. BOX 35, HEMEL HEMPSTEAD, HERTS HP1 1EE

MICHAEL'S MODELS FINCHLEY

MICHAEL'S MODELS

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

M.V.V.S. D7 2·5c.c. Diesel

£12.75

Postage 10p

Paybonds accepted, Access Card and Barclaycard welcome

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

BINDERS

£1.35 including postage & packing and V.A.T.

FOR YOUR COPIES OF AERO MODELLER

In handsome red book-cloth with gold blocked name plate on spine to take 12 copies of your AEROMODELLER. Copies open flat and can be removed unmarked as required.

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

THINKING OF RADIO?

NOW THERE **IS** AN ALTERNATIVE TO **'OLD HAT'** BANG-BANG ESCAPEMENTS! AVAILABLE IN BRITAIN NOW IS THE ULTRA LIGHT PROPORTIONAL RUDDER SYSTEM THAT IS SWEEPING AMERICA, AND HERE'S WHY–

Ace Commander—

- FROM 2½ oz. AIRBORNE WEIGHT!
- SUPERHET RECEIVER 2.4 VOLT
- FULLY PROPORTIONAL STICK CONTROL AND IN-FLIGHT TRIM
- SMOOTHER AND EASIER TO FLY
- NI-CAD AND MAINS ISOLATED CHARGER INCLUDED
- READY WIRED, PLUG-IN SYSTEM
- INTERCHANGEABLE ACTUATOR/BATTERY COMBOS
- HIGH POWER TRANSMITTER
- SIMPLE – RELIABLE. ONLY ONE MOVING PART
- 1½ TO 2 HOURS FLYING PER CHARGE*
- HIGH QUALITY – GUARANTEED

COMPLETE AIRBORNE WEIGHTS (Stock Systems)

Unit	*Weight*	*Recommended Use*
Baby/225 ma.*	2.5 oz.	.020 or up to 48" glider
Baby Twin/225 ma.*	2.7 oz.	.020 or .5 c.c. 70" glider
Standard/500 ma.*	4.4 oz.	.049-.10 cu. in.
Standard/225 ma.	3 oz.	,, ,,
Stomper/500 ma.*	4.8 oz.	.049-.23 cu. in.
Stomper/225 ma.	3.4 oz.	,, ,,

GREAT for Beginners – **FUN** for Experts

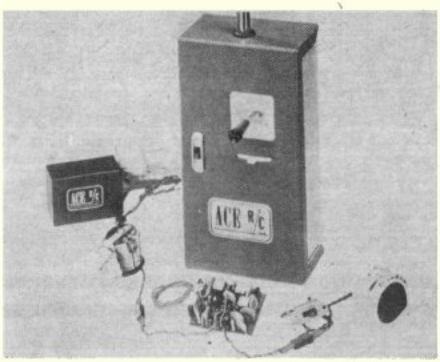
Thousands sold. The ideal way to start R/C at low cost. Never obsolete because of unbeatable low weight for tiny aircraft. Endless possibilities for proportional rudder in free-flight scale designs!

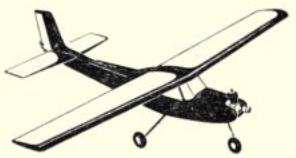
£28.95

10G15 BABY

10G15T BABY TWIN SYSTEM £29.95
10G16 STANDARD SYSTEM £29.50
10G17 STOMPER SYSTEM £30.95

Please state frequency
25.995, 27.045, 27.095, 27.145, 27.195
16-page Owner's Manual with complete flight course for Beginners comes with each system.
ADD 10% VAT + 25p p.&p.





Highly recommended for beginners. 34" moulded foam wing. Designed especially for Propo. Rudder with Commander Baby or Baby Twin and Cox Pee Wee .020. 12-14 oz. flying weight.

ACE DICK'S DREAM KIT £4.25

ACE R/C INC.

Est. 20 years

Send 3½p stamp for fully detailed Brochure

MAIL ORDER ONLY
C.W.O. to:

SKYCRAFT

29 BYRD, STATION RD., WHITLEY BAY, NORTHUMBERLAND

MODEL and a HOBBY
CHRISTMAS NEW YEAR

Review of International F.A.I. Team Racing in 1973

Date	Venue	Result	Engine	Propeller	Best Heat
April 20-22nd	Hradec Krolove Czech	1, 2 & 3	Bugl 15	Bartels	4:24
May 26-28th	British Nats., England	1, 2, 3 & 4	Bugl 15	Bartels	4:27
July 6-8th	Pecs, Hungary	1, 2 & 4	Bugl 15	Bartels	4:14
Sept. 1-2nd	Breitenback, Switzerland	1, 2 & 3	Bugl 15	Bartels	4:20
Sept. 8-9th	Bochum, Germany	1 & 4	Bugl 15	Bartels	4:19
Sept. 29-30th	Lugo di Romagna, Italy	1, 2 & 3	Bugl 15	Bartels	4:14
Oct. 5-7th	Nyiregy-Haza, Hungary	1, 2 & 3	Bugl 15	Bartels	4:12

P B MOTOREN

PAUL BUGL
8501 MOOSBACH 164
WEST GERMANY

BARTELS GLASSFIBRE PROPELLERS

JURGEN BARTELS
29 OLDENBURG
POSTFACH 563

RipMax single-channel

PATHFINDER

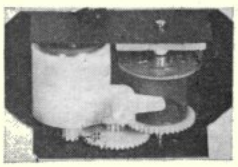
Tx-Rx COMBO . . . . . only £11.75

Yes . . . this modest sum buys a HIGH POWER TRANSMITTER and matching MINIATURE RECEIVER of fully proven quality and reliability.
Add the plug-on ESCAPEMENT PACK and you have a COMPLETE SINGLE-CHANNEL SYSTEM (less batteries) for UNDER £14! The inexpensive way to start Radio Control!

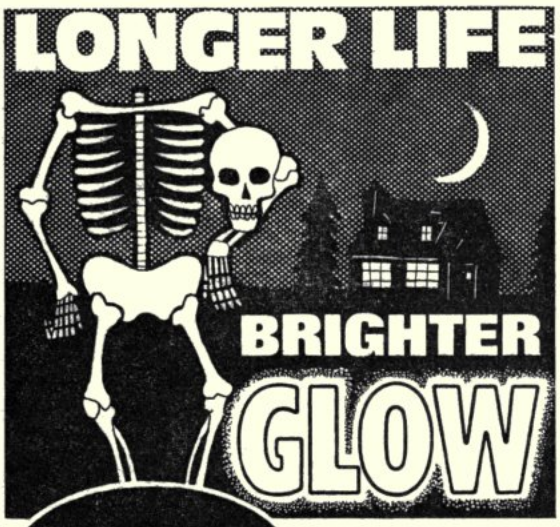
Prewired ESCAPEMENT PACK £1.95
Prewired RELAY PACK ... £1.95
(adapts Rx to work MOTORISED ACTUATOR)

MOTORISED ACTUATORS

Minimite Rudder Servo **£3.90**
Minimite Motor Servo **£3.90**
SPECIAL OFFERS!
MK Dynamo Servo ... **£4.45**
MK Dynavator Servo **£4.90**
(special ELEVATOR actuator)
Rand LR3 Servo ... **£9.95**
(The BEST Galloping Ghost servo)
Selectagear Pulse Servo **£2.95**



AT YOUR MODEL SHOP



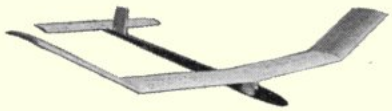
JOY LUMINOUS PAINT

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

JOY quality products for Sticking, Staining, Polishing, Painting

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

ST. LEONARDS MODEL SUPPLIES



ASTEROID
48" span A1 glider with contest performance.
£2.20 inc. p&p

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

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

Designed by JIM BAGULEY all kits have: Simple construction; Detailed Plan and Instructions; Die Cut Ribs; Coloured Tissue.
Expert back-up advice if needed.
May be obtained from all leading model shops.

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 £

CLASSIFIED ADVERTISEMENTS

All Classified Advertisements must be pre-paid.
PRESS DATE for January issue, 1974, 16th November, 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 16th November 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.

Who is BINDING?

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

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

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

FOR SALE

A.P.S. Pika ready to fly with S/C R/C, £25. Combat models, one with Oliver Mk. II, £5, other McCoy 29-powered, £4. Enya 15, £1.50. Cox QZ 049, £1; near new D.C. 1.5 c.c., £2.25, new 2v. battery and charger, £1.25 each. C. Grant, 4 Plantation Way, Amersham, Bucks. J.

K.K. Radian control-line stunt model. Cox 049 complete and ready to fly, £4.50. E. Soumian, 12 Rhodes Avenue, London, N.22. J.

P.A.Ws. 2.49, £3, 1.49, £2, O.S. 10 R/C, £4. 'Aeromodellers' 1970-present, 10p each. Tel: Plumtree 2995. J.

Testors Cosmic Wind ready to fly C/L trainer with McCoy 049 and all accessories, £7. D.C. Merlin, six hours' running time, £2.25. Cox Thimble Drome, £2. Details on request. S. Main, 24 Camperdown Road, Nairn, Scotland. J.

CORNISH GLIDING AND FLYING CLUB
Gliding Courses in modern fleet from May – B.G.A. Fully Rated Instructors – fine soaring – lovely coastal airfield – ideal for a different family holiday – Aerotows available.

Details with pleasure from:
The Course Secretary
The Cornish Gliding and Flying Club
Trevellas Airfield, Perranporth, Cornwall
Phone: Devoran 862518

SWANSEA
SWANSEA
SWANSEA
See Model Shop Directory

GOLDEN AGE PLANS

Classic flying scale rubber designs from Magazines and kits of the thirties reproduced exact size in fine line black print on large sheets, Lockheeds, Bellances, Cessnas, Curtiss, Corben, Martin, Fairchild, Piper, etc. Plus Hawker Hart, Supermarine S6B, SE5, Fokker DR1, Camel, GeeBee, etc.
Send addressed envelope and International reply coupon for illustrated list and prices to

Golden Age Reproductions
P.O. BOX 13, BRAINTREE, MASS. 02184, U.S.A.

WANTED

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, N.2. Telephone: 01-455 1963. T/C.

Wanted. Dooling .29, Dooling .61, McCoy .60, good condition, state price. Tel: Bloxwich 77530, Perrins, 12 Providence Close, Leamore, Walsall, Staffs. J.

Reliable easy-to-manage, radio-controlled model aircraft wanted, single- or multi-channel, anything considered. P. McManus, Newton Park Farm, Newton Solney, Derbyshire, or telephone Repton 3280 evenings, Derby 45665 daytime. J.

To buy/copy/exchange. A/M 1961 index. R.C.M.&E. indices 1960/63/65. To buy/exchange A/M Annuals 1965/6 and 1966/7. Various pre-1950 'Aeromodellers'. Telephone: Jones 01-422 1752 or write 75 Ravenswood Crescent, Harrow. J.

---

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

BOOKS

Wanted. Aeromodeller Annual – 1966/67, 1967/68, 1968/69. I will pay £2 for each. Marhly Vinko, Grizoldova 2, 62342 Ruse, Yugoslavia. JK.

Wanted. 'Model Airplane News' February to December 1971, February to October 1972, 'American Aircraft Modeller' 1972. Davy, 8 Carr Lane, Willerby, Hull. J.

American magazines by annual subscription. 'Flying Models', £3.15. 'Model Airplane News', £4.95. 'American Aircraft Modeller', £5.50. Send stamp for complete list. Willen (Dept. 1), Howard House, Howard Road, London E11 3PL. Tel: 01-556 7776. T/C.

'Aeromodeller' back issues mart, vast stocks of back issues held in stock. Beaumont, 11 Bath Street, London, E.C.1. ALT/TC.

PERSONAL

Penfriends wanted anywhere, any age. S.A.E. to: Pen Society, (T77) Chorley, Lancs. J.

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

BOB ASHBY
Secondhand Engine Specialist

All types of motors bought and sold. Send that old or unwanted motor for best quote by return. S.A.E. for list.
Moreroyd House, 99 Dark Lane, Batley, Yorks WF17 7PW
Tel. Batley 476709

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.

For a change of pace, try a Peanut, or two, or three. Bob Peck's Druine Turbulent, Miles M18 and Pietenpol Air Camper.

Peanut scale kits are still available at **£1** each plus 25p p/p on any number of kits. S.A.E. for details or a 20p P.O. will bring you the complete illustrated catalogue of over 50 small flying scale plans from the Bill Hannan Hangar plus details of accessories.

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

MISCELLANEOUS

Calling all aeromodellers in the Glasgow area. If you have experience in aeromodelling or radio control, we may have just the job for you. Please call at Argyle Models, 247 Argyle Street, Glasgow. J.

HANG-GLIDING/KITE SOARING!

Want to know more?

Send S.A.E. for details to:
NATIONAL HANG-GLIDING ASSN.
9 The Drive, W. Wickham, Kent

Cash on Delivery Service

It is known throughout the modelling world that we have the best stocks in the country but even we sometimes fail to deliver the goods for various reasons – for example: Two modellers sending for the same item at the same time and we only find one in stock. To make things easy all round why not make use of the Post Office with C.O.D. service.

1. **If we have the item you require you will receive this by return.**
2. **If we are expecting further stocks we will inform you that your order will be delivered in approximately 7 days.**
3. **We will know if your requirements are not available and will inform you accordingly suggesting an alternative.**

PAY THE POSTMAN C.O.D. – IT MAKES GOOD SENSE

Newsletters and all lists sent for 20p in stamps

ROLAND SCOTT LTD.
28 EAST LANCASHIRE ROAD (A580), WORSLEY/SWINTON, LANCS.
Phone: Walkden 6707 (061-790 6707)

KINDLY MENTION 'AEROMODELLER' WHEN REPLYING TO ADVERTISEMENTS

AUTHENTIC-SCALE

For the Scale Fan who enjoys building as much as flying . . . a flying scale series designed by the 'Master Modeller' – Harold J. Towner.

N.A. MUSTANG P51. Showing 'B', 'C' & 'D' variants. Highly detailed. For C/L but can be modified for R/C. For O.S.15 or similar. 'A real beauty.' 1" scale, 37" w/span
Price **75p** + 5p p.&p.

H.P. HAMPDEN. The R.A.F.'s 'FLYING SUITCASE'. Twin engines, for rubber. A truly impressive replica. 29" w/span.

BRISTOL BEAUFIGHTER. A lovely replica of this famous aircraft which flies really well. 28" w/span.

HAWKER TYPHOON 1B. For F/F or C/L. Suitable for R/C conversion. 28¼" w/span.

REPUBLIC THUNDERBOLT P47D. The famous 'JUG'. For rubber, but would convert to power. 27¾" w/span.

FAIREY BARRACUDA. F/F Power or S/ Channel R/C. Features folding wings as per original. 26⅝" w/span.

BELL AIRACOBRA. Rubber only. A superb model of this beautiful machine. 25" w/span.

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

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

BUILD FOR 1974 with RONYTUBE

A2 tubes at **£1.50** each + p.&p. 50p (up to 4)
A1 tubes at **£1.30** each + p.&p. 50p (up to 4)
FAI/0 power tubes at **£1.80** each + p.&p. 75p (up to 2)
Chuck glider tubes, 20, 24, 30 in. long at **30p, 40p, 50p** each + p.&p. 20p (up to 12)
Wing spars, 18 in. long **30p** per pair + 20p p.&p. (up to 12)
Postage rates apply U.K. only, otherwise send for quotation.

Inquiries and orders to:

RONYTUBE
23 IVY ROAD, WALKERVILLE, NEWCASTLE UPON TYNE NE6 4PU
or telephone 0632-623735

VINTAGE FLYING SCALE PLANS

1940 Aer-O-Kits 15" Master, Battle, Harvard, Moth Minor, Fury, Cygnet, Vildebeest, Wellesley. Plan, instructions and printwood for ribs and formers **20p** each. All 8 **£1.25** (U.S. $6.00).
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. All 12 **£1** (U.S. $4.00).
Trailblazers from 'Flying Aces' 1937/9 Depersdussin, Gun-Bus, JN4 – **15p** each (U.S. 50c).
Wright, Bleriot, Curtiss Pusher, Douglas DWC Spad D7, Ryan NYP, **20p** each (U.S. 50c).
NC4 Flying Boat, Handley Page 0/400 – **25p** each (U.S. 75c).
Aeromodeller 19" Miles Master II (Nov. 1941 issue) – **20p** (U.S. $1.00). All post paid.

S.A.E. or international reply coupon for illustrated list of over 50 plans

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

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

WOLVERHAMPTON MODELS & HOBBIES

Bell Street, Manders Centre, Wolverhampton
Established 1957
Tel. Wolverhampton 26709

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

Take a holiday gliding course with the
YORKSHIRE GLIDING CLUB
Fully residential Clubhouse with Licensed bar – full-time professional instructors – wave and hill soaring – modern fleet of gliders and tug aircraft – winch and aerotow launches – Falke motor Glider.
Book now for 1974 season April to September.
For brochure write to: **The Secretary, Yorkshire Gliding Club, Sutton Bank, Thirsk, Yorks.** Tel. Sutton (Thirsk) 237

Another exclusive engine from The Modellers Den
The 1·5cc Russian MK16 diesel for just £4·95!

The Modellers Den are proud to introduce the attractive precision engineered 1.5cc MK 16 Diesel from Russia. Each MK 16 –

* Has an output of 0.14 BHP. at 14000 RPM
* Twin Ball Races for smooth running.
* Weighs under 4oz.
* Comes with an 8" nylon prop, double-ended spanner, tommy bar and mounting screws.

* Is test run before despatch.
* Carries a full guarantee and is backed with a comprehensive spares service.

Why not add this exclusive 1.5cc engine to your collection? Simply post your order (Enclosing cheque/postal order for £4.95) now to –
The Modellers Den Ltd.,
Dept M3, 2 Lower Borough Walls,
Bath BA1 1QR. Tel. (0225) 60115.
Registered No. 1035873 (England).

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

PIRELLI rubber. Hanks 500 gms. – 75 yd. approx. post paid	£3.25
SUPER TIGRE G 15 'Goodyear'	£14.50
TATONE D/T timers	£2.65
ROBERTS 3-line C/L handle for Scale and Carrier	£3.75
ROBERTS 3-line bellcranks upright or suspended	£1.82
Nitromethane, 500 cc (callers only please)	£1.50
K&B 35 Stunt motor. Special offer. Cannot repeat	£6.50
FOX 29X stunt motor. Special offer. Cannot repeat	£4.95
A.M. 10 1 c.c. diesel. Special offer. Cannot reneat	£3.95
VARLEY 2v. 9 amp/hr. accumulators. Non-spill type	£2.53
U-REELY C/L handle complete with 150 ft. lines	£6.25

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

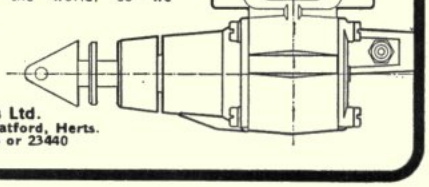
THE CHOICE OF CHAMPIONS

ETA

TRADE MARK

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

SEND FOR LEAFLETS TODAY!



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

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
Plastruct Centre
Comprehensive stock of kits, engines and accessories for C/L and F/F.
Paybonds – Access – Barclaycard

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.

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

EXETER
Tel: 76935

EXETER
RADIO CONTROL
MODELS
35 SOUTH STREET, EXETER EX1 1ED.

FAREHAM
Tel: 4136

G. M. H. BUNCE & CO. LTD.
206 WEST STREET, FAREHAM

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

FARNWORTH
Farnworth 74688

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. Dunston 605545 Whickham 887218

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

Veron, K.K., Graupner, RipMax, Micro-Mold, Fibreglassfuselages & Ronytubes, Fox engines, R/C equipment & accessories. Free advice & flying tuition. Ask for Bill Gordon.

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

KINDLY MENTION 'AEROMODELLER' WHEN REPLYING TO ADVERTISEMENTS

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, 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
Closed Monday and Thursday
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, glow 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 agent 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

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

Skill, patience and Humbrol modelling products

Quality, reliability and value for money make Humbrol modelling products brand leaders the world over. Ask for Humbrol by name . . . available from all leading Model and Toy shops.

Humbrol will be pleased to send you— FREE—colour cards and leaflets.

Write to: Mr. W. H. Stewart, Product Manager, Dept. 12, Modelling Division, Humbrol Limited, Marfleet, Hull.

HUMBROL