

February 1976

Aero Modeller

30p USA & Canada \$1.50

INCORPORATING
MODEL AIRCRAFT



HOBBY MAGAZINE



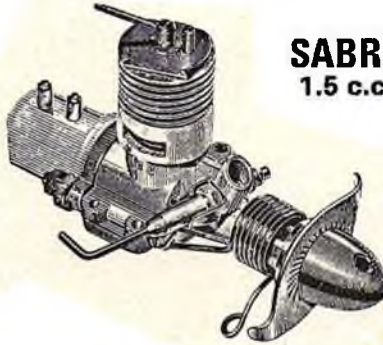
QUICKSTART

The Motors for the Modern Modeller!

**Quality
Reliability
Economy**



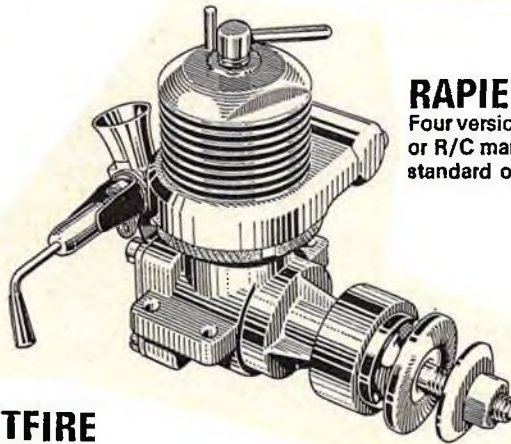
DART
.5 c.c.



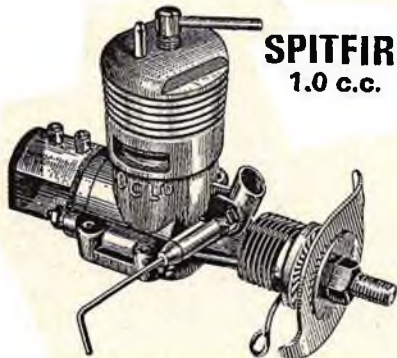
SABRE
1.5 c.c.



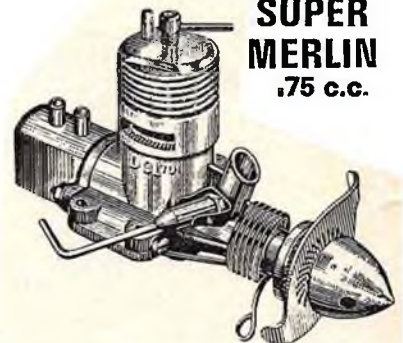
WASP
.8 c.c.



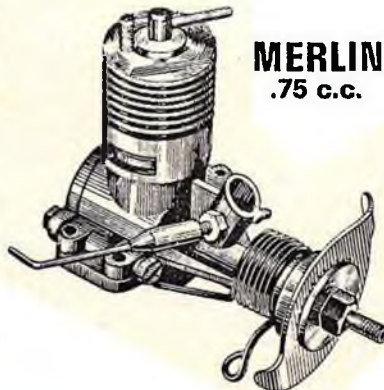
RAPIER 2.5 c.c.
Four versions - Aero standard
or R/C marine, water-cooled
standard or R/C.



SPITFIRE
1.0 c.c.



**SUPER
MERLIN**
.75 c.c.

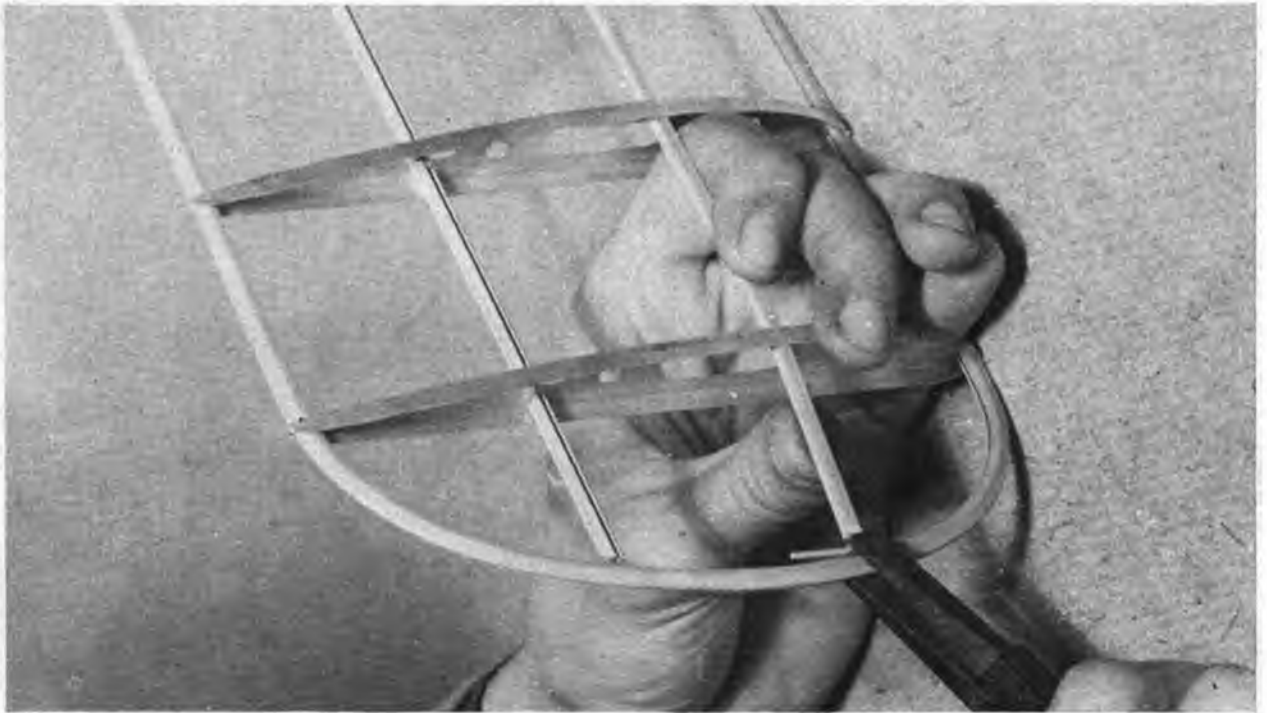


MERLIN
.75 c.c.

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

**Quality
engineered
for lasting
performance**

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



Nearly fifty years ago a revolutionary new material was introduced for aeromodelling—Balsawood. Suddenly, models were capable of achieving a performance hitherto undreamed of—especially when thermals were ‘discovered’ as well!

It took nearly ten years for Balsawood to ‘circulate’ throughout the aeromodelling world, when by that time it was the automatic choice for every flying model. It was simply a fact that Balsa models fly better. Also you could produce any sort of aeroplane shape you wanted in it and still end up with a practical, lightweight airframe.

Of course, that did not satisfy everyone. Having run out of ‘shapes’, some modellers had to try different materials, like metal for airframes, for example. Quite clever, and reasonably light. But not as light as a balsa airframe—nor, surprisingly, as strong! (Perhaps the other saying ‘the heavier the model the harder it hits’ had something to do with it).

So—back to Balsawood as the standard aeromodelling material. It would be a different and far less successful aeromodelling world without it. There are still enough Balsa trees around to meet the demand, but that is only part of the story. Successful aeromodelling demands the use of the best Balsawood, which is where Solarbo have always come into the picture. Our know-how in selecting top aeromodelling quality Balsa dates back (almost) to the time when Balsawood was a ‘new’ material!

SOLARBO
LIMITED

COMMERCE WAY • LAÑCING • SUSSEX • BN15 8TE • ENGLAND

**WHERE GOOD Balsa
COMES FROM**

Buy and Fly the Best...

VERON

BATTLE CRY! Looking for a Dog-fight?

YOU WOULD NEVER BELIEVE HOW MANOEUVRABLE & YET STABLE THIS FINE WORLD WAR I FIGHTER COULD BE



SO TRY THE SOPWITH 1 1/2 STRUTTER

VERY-NEAR-TO-SCALE
Circa 1916-18

48" Span (1220mm)

Photo of our Prototype Model fitted with 2 Channel Proportional on Rudder & Elevator only (optional 3 on Motor), powered with a 3.44cc 'GLOW-STAR' with Silencer. For 2.5 to 3.5cc (.15 to .19cu.in.) A.B.S. Vacuum Formed Cowling, Semi-pneumatic Vintage Wheels, Vinyl Decals, Superlative Die-cutting, Preformed Wire Strutting and Super Kitting.

KIT PRICE £22.94

3 KWIK-FIX PRE-DECORATED FLYING SCALE MODELS



EASY TO BUILD : FUN TO FLY

All die-cut and decorated parts! Dead easy to build! Plastic Prop, Pre-shaped Undercarriage with fitted Wheels, Rubber Motor, Pictorial Plans. Realistic performance.

CITABRIA (Illustrated) 22"
SKYWAGON 23" BOLKOW JUNIOR 22"

KIT PRICE £1.67

YOU DON'T HAVE TO KNOCK YOUR PAL OUT OF THE SKY — BUT SIMULATED DOG-FIGHTS CAN BE REAL FUN — ESPECIALLY WITH SUCH AN ADVERSARY AS THE

FOKKER D.VIII. (46" Span 1168mm)

ALL IT NEEDS IS ONE PROPORTIONAL SERVO FOR SOME CARE-FREE & EXHILARATING FUN FLYING — AND GLIDING



KIT PRICE £14.95

For 1.5cc (.09cu.in.) With Rudder only (Single of 1 Prop) and up to 2.5cc (.15cu.in.) with 2-Ch. Prop on Elevator and Rudder.

Also for Free-flight with 1cc.

Webra

THE FINEST ENGINES

FOR YOUR MODELS

HERE'S A GOOD SELECTION OF R.C. ENGINES!



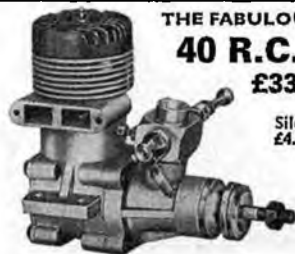
Record 1.5cc	£11.79	Speed 61 Roar Ind.	£49.50
Winner 2.5cc	£12.89	MARINE R.C. ENGINES	
Glo-Star 3.5cc	£16.90	40 RC	£39.50
40 RC 6.5cc	£33.00	Speed 40 RC	£39.50
Speed 40 RC	£33.00	Speed 61 (Front)	£52.50
61 B'hd. 10cc	£42.98	Speed 61 (Rear)	£56.50
Speed 61 10cc	£45.00	AND ALL ACCESSORIES	

Illustrated left - 'Glo-Star' 3.5cc
Ideal for the Sopwith Strutter

THE FABULOUS 40 R.C.

£33.00

Silencer
£4.68



Craftsmanship at its best - backed by the fact that Webra have been the power behind many World Championship wins

DISTRIBUTED BY VERON - AVAILABLE FROM YOUR DEALER!

KINDLY MENTION 'AEROMODELLER' WHEN REPLYING TO ADVERTISEMENTS

Aero Modeller

INCORPORATING
MODEL AIRCRAFT

February 1976

Volume XLI No. 481

CONTENTS

HANGAR DOORS	71
'BOEING F4B-4'	72
THE GHOSTLY COUPE	74
FLYING SCALE COLUMN	77
BETWEEN THE LINES	80
CAMBRIDGE SCIENTIFIC KITE	85
TOPICAL TWISTS	86
THOSE EARLY DAYS	87
SMAE ANNUAL PRIZEGIVING	90
UPDATING THE 'LIVELY LADY'	92
HEAD EAST YOUNG MAN	95
THE FREE FLIGHT SCENE	95
LATEST ENGINE NEWS	103
CLUB NEWS	106
CONTEST CALENDAR	107



HOBBY MAGAZINE



ALSO MODEL BOATS . RADIO CONTROL
MODELS & ELECTRONICS . MODEL ENGINEER
MODEL RAILWAYS . SCALE MODELS . WOOD-
WORKER . MILITARY MODELLING . GEMCRAFT
BATTLE and PUZZLES DIGEST

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

Second-class postage rates paid at New York, N.Y. Registered at the Post Office 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 HPI 1EE. Tel: Hemel Hempstead 56117.

Subscription Department: Remittances to Model & Allied Publications Ltd., P.O. Box 35, Bridge Street, Hemel Hempstead, Hertfordshire HPI 1EE (subscription queries Tel: Kings Langley 66846). Direct subscription rate £5.00 per annum, including index, \$15.00 (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 10th of each month for publication in the next immediate issue. Photographs should be accompanied by negatives where possible and can only be accepted for use on an exclusive basis for British Copyright. AERO MODELLER incorporates the MODEL AEROPLANE CONSTRUCTOR and MODEL AIRCRAFT and is published on the third Friday of each month prior to date of publication by

MODEL & ALLIED PUBLICATIONS LTD.

P.O. BOX 35, BRIDGE STREET, HEMEL HEMPSTEAD, HERTS HP1 1EE
Tel.: Hemel Hempstead 2501-2-3 (Mon.-Fri.)

Editorial Director

D. J. LAIDLAW-DICKSON

Managing Editor

R. G. MOULTON

P. S. RICHARDSON

Advertisement Manager

M. GRAY

Comment

The annual re-union of delegates to the International Aeromodelling Commission (CIAM) of the FAI saw no drastic changes in model specifications. But this conservative result was not for the want of trying on the part of some nations. We *might* have had shorter towlines for A/2 gliders, smaller rubber motors in Wakefields, two classes of Coupe d'Hiver, tiny team race tanks, a Formula One pylon race takeover, team entry for scale, up to .80cu.in. engines, and votes by only those who have an active interest in the debated subject. Instead: there are rule freezes on R/C Pylon and R/C Aerobatics; Combat is at last a W/Champs class; stand-off scale and electric R/C contest rules are internationally provisional; R/C helicopter contest details are on the table; there are to be 2nd attempts in free flight fly-offs; and those enigmas of free flight Championship organisation, towline crossing and mid-day thermal activity are on the way to clarity.

Sweden is to run the World Champs for Scale Models at Dalarna, 200 miles north of Stockholm from 18th-25th June, and Britain will host the Indoor Champs at Cardington 27th-31st August. The Netherlands will run Control Line at Utrecht, 7th-12th July. No one has offered to run the Space Models event. For 1977, the Free Flight Champs venue is still to be decided, Austria has offered to stage R/C Aerobatics at Klagenfurt and South Africa will have the first W/Champs for Thermal Soaring. Looking beyond '77 the United States and Britain have each offered to run C/L. Our invitation also includes the Scale events as part of a spectacular at Woodvale in the N.West.

on the cover

When Andre Meritte won the 30th Coupe d'Hiver International at Le Plessis Belleville near Paris in February 1974, the weather contrasted strongly with that experienced at the first British-hosted meeting at RAF Halton, as reported on pages 74-76. Andre is shown with his 'Gadget Special' which apart from winning the '74 event, was also used in the six-minute fly-off the previous year.

next month

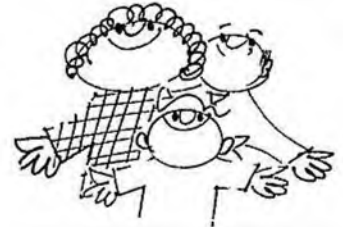
More for everyone in the March issue, with news of the latest development in man-powered flight, kit review (both regrettably held over from this issue), a full-size 'Peanut' plan, further comments from the early days of aeromodelling, plus regular features on control line, free flight, scale and engine topics - all in the March *AeroModeller* on sale 20th February.

New glues from UHU



Now there are four super glues in the UHU family. UHU Balsa Wood, UHU Plastic Modelling Glue, UHU PVC, and the big daddy of them all — UHU All Purpose.

Whichever glue you need, choose UHU. It's the big name glue you can trust.



UHU super glue

Trade enquiries to: Liberta—Imex Limited, 13, Consul Road, Rugby, CV21 1PB. Tel: Rugby (0788) 77320/77440

*Control Line
specials from*

ST. LEONARDS MODELS

NEW — Lively Lady



£10.50

45" span Control Line Stunt Model for 2.5 to 5cc by Ken Day. Extensively prefabricated.

HARDWARE SUPPLIED WITH ALL KITS



Spitfire

18" Control Line Trainer for .5 to 1.0cc by Jim Baguley. Prefabricated solid balsa construction. £2.95

Excalibur

34" FAI Class Combat model for 2.5cc by T. R. Mason. Modern shape for speed and manoeuvrability. Simple die cut prefabricated construction hardwood reinforced for toughness. £4.20

Lucky Lady

32" Control Line Stunt model for 1.5 to 2.5cc by Ken Day. Extensively prefabricated. £5.70



Little Lady

26" Control Line Stunt model for 1 to 1.5cc by Ken Day. Extensively prefabricated. £4.50



**AVAILABLE FROM ALL THE BEST
MODEL SHOPS.**

Designed by Jim Baguley, using 20 years of contest winning experience.

ST. LEONARDS MODEL SUPPLIES

ASHTREE CLOSE, WORLINGHAM, Nr. BECCLES, SUFFOLK.
Telephone: Beccles, 713786

KINDLY MENTION 'AEROMODELLER' WHEN REPLYING TO ADVERTISEMENTS

FOX

CONTROL LINE STUNT SPECIALS



The size, weight and performance of the .35 Stunt has made it the world's leading contest stunt motor for 24 years. We are even more proud of the fact that it has introduced hundreds of thousands of young men to model building. An ideal beginner's motor, its low compression is easy to crank and forgiving of poor tank installations. The B size FOX SILENCER is easily bolted onto the exhaust stack studs.

£10.15 B silencer £3.42

FOX COMBAT SPECIAL

A brand new Super Combat Special is now available. Some of the features are: two ball bearings on main shaft, three by-passes, thicker cylinder liner and solid one horsepower out-of-the-box. This 6cc power plant turns an 8x7 in. prop at 19,000 RPM!

£19.21



Distributed by: **VERON, IRVINE ENGINES & RIPMAX**

JOHN D. HAYTREE, Fox Manufacturing Co. (U.K.)
40 BUCKERIDGE AVENUE, TEIGNMOUTH, DEVON

G.A.P. 15 D.H. BEAVER

72" span R/C Model for 35-40 power motors



Illustrated British Army version, built by J. M. R. Fleming, Wilts. This model is fitted with (5) function equipment including operating flaps. Mr. Fleming refers to the standard of materials in his kit as first class.

ITEMS AVAILABLE:

Three Sheet Plan £2.16 plus 20p P&P
Pre cut Kit £35.86 inc. postage

ITEMS WHICH CAN BE PURCHASED SEPARATELY:

Glass-fibre cowling £2.30 plus 46p P&P
Plastic wing ribs £2.14 plus 21p P&P
(Stick with normal Balsa cement)

Please send 18p Postal Order for our latest red cover lists
Prices include V.A.T.

NOTE: Plans sold separately from kits

KIT CONTENTS

All parts cut to shape, formed undercart wires, glass fibre cowling, R/C fittings, nylon covering, clear sheet for wind-screen etc. Plus ample sheet and strip Balsa wood for construction work.

COMPLETE-A-PAC Tel: 0896-84334
West High St., Earliston, Berwickshire, Scotland

SWITCH ON ...and FLY!!



MABUCHI A1

Powered by two rechargeable SUPER CELLS easily inserted in battery holder. Motor unit clips onto simple MOTOR MOUNT (supplied) . . . then you can SWITCH ON AND FLY! 4 1/2 in. dia. prop gives a power run of up to 40 seconds on a single charge* - develops roughly the same power as a small glow motor! Weight complete with batteries, 2 1/2 oz.

ENJOY QUIET, CLEAN, NO FUSS POWER FLYING with single, twin or multi-engine installations! Just design your next free-flight model - sport or scale - around this REVOLUTIONARY NEW ELECTRIC POWER UNIT!

All components (except electric motor) constructed of light, tough plastic - virtually crashproof.

WISPER the first British kit especially designed for A1 AEROMOTOR POWER! 24" span price £2.60



Recommended model size up to 36 in. span. Use lightweight construction for best flight performance. Many existing kit models are readily adapted to A1 AEROMOTOR power - like the CAMBRIA "HOBO" in the photograph above. Try TWIN ENGINES on larger models!



RECHARGE IN 60 SECONDS!



Recharge your A1 AEROMOTOR right on the flying field with the MABUCHI QUICK CHARGER. Place Super Cells in top compartment and press button down for required charging time. (Every 1 minute charge time gives approx. 10 seconds flight time) *4-5 minutes for maximum flight duration. Charger is powered by its own replaceable dry batteries.

A1 AEROMOTOR UNIT £2.40

A1 AEROMOTOR BATTERIES (pr) . . £1.40

A1 AEROMOTOR CHARGER £3.45

Distributed By Ripmax

AT YOUR MODEL SHOP

← **Quest WISPER**

Specially designed around the MABUCHI AI AEROMOTOR. All-sheet balsa with die-cut fuselage, wing and tail parts - pre-shaped ply formers, wheels, dowel, u/c wire. Assembles quickly and easily - and is GREAT FUN to fly.



24" span

price
£2.60

Quest

IMP



18" span for .049 glow or 0.8 - lcc diesels

THE IDEAL FIRST CONTROL LINE MODEL

price
£1.95

ALL wood parts pre-shaped, plus bellcrank, control horn, wheels, u/c clamps, wire, fixing screws, etc. Fully detailed PLAN and instructions.

also **READY-TO-ASSEMBLE**

BANDIT



12in. span CHUCK GLIDER—for fun! . . . 43p

LUCIFER



18in. span CHUCK GLIDER—for contests! . . . 54p



QUEST KITS are superior BRITISH designs, fully prefabricated, and very complete!



YOUR SIGN OF GUARANTEED QUALITY

DISTRIBUTED BY RIPMAX

AT YOUR MODEL SHOP

WOLSTENHOLME

MODELS

**45/47 WHALLEY ROAD,
ACCRINGTON, LANCs.**

Telephone: (STD) 0254-37771

Payment by **ACCESS, BARCLAYCARD, PAY-BOND** etc. — **Just ring your card number**

BALSA PRICE LIST AS FROM DEC 1st

Size	Price
1/2" x 1/2" x 36" x 10	£0.32
3/8" x 3/8" x 36" x 10	£0.40
1/2" x 1/2" x 36" x 10	£0.56
1/4" x 3" x 36" x 10	£1.36
1/8" x 4" x 36" x 10	£2.00
1/8" x 3" x 36" x 10	£1.52
1/8" x 4" x 36" x 10	£2.24
3/8" x 3" x 36" x 10	£1.84
3/8" x 4" x 36" x 10	£2.72
1/2" x 3" x 36" x 10	£2.00
1/2" x 4" x 36" x 10	£3.04
3/8" x 3" x 36" x 10	£2.40
3/8" x 4" x 36" x 10	£3.28
1/2" x 3" x 36" x 5	£1.40
1/2" x 4" x 36" x 5	£1.92
3/8" x 3" x 36" x 5	£1.84
3/8" x 4" x 36" x 5	£2.56
1/2" x 3" x 36" x 5	£2.29
1/2" x 4" x 36" x 5	£3.12
1" x 1" x 36" each	£0.36
2" x 2" x 36" each	£1.07
2" x 3" x 36" each	£1.59
3" x 3" x 36" each	£2.24
3" x 4" x 36" each	£2.92
1/2" x 1/2" x 36" x 10	£1.16

CONTROL LINE KITS IN STOCK NOW

KeilKraft Ranger	£2.32
Radian	£2.32
Champ	£2.30
Damon	£4.95
Gazelle	£2.75
Spectra	£6.50
Marquis	£5.35
Talon	£4.25
Mercury Cobra	£4.72
Toxan	£2.06
Marvin	£2.34
VERON COMBATEER	£4.67

WILLIAMS SMOOTH CONTOUR WHEELS

4 1/2 in. diameter	£4.65
2in. Scale Gun Kits	
Parabellum	£1.75

We stock kits by KeilKraft, Mercury, Pegasus, Lindoa - and all accessories.

IF YOU ARE LOOKING FOR A GLIDER, HAVE A GLANCE AT THESE

Keil Kraft Chief	£4.25
Topper	£1.95
Caprica	£2.95
Elmira	£17.95
Mercury Swan	£1.66
Martin	£1.50
Jolly Roger Standard	£14.95
Super	£15.95
E.M.P. Ageas	£21.40
Avon Craft Slingsby	£14.11
Veron Cobra	£37.96
Super Nova	£16.75
Ripmax Ivinghoe	£10.25
Cambria Capstan	£15.95
Mini Phase	£9.44
Veron Impala	£9.62
Springbok	£14.58
Pegasus Mijat	£17.50
Topaz	£26.24
Craft Air Windrifter	£24.92
Moby-Hawk A.R.T.F.	£62.50

Late-night Opening
Fridays till 7.30pm. Closed all day Wednesday. Mail Order a pleasure. Post free over £30. Prices are correct at time of going to press.

WE STOCK PROFILE PUBLICATIONS

FREE FLIGHT	
Mercury Wizard	£4.25
Veron Sky Skooter	£5.48
K.K. Snipe	£2.94
K.K. Cossna 1170	£4.28
K.K. Ladybird	£4.28

ENGINES	
Cox Medalion .15 STD	£14.95
Webra Glo Star 20 with silencer	£15.35
O.S. 20 STD with silencer	£12.29

ONE ONLY—OLIVER TIGER
MAJOR second hand, works mod. STD and RC Carb—silencer, with asst. spares.
FIRST—£18.00

K.K. HANDBOOK 50p

Now! The one you asked us to make ...

The New MacGregor Digimac I

One Channel proportional bargain at only

£39.50

Yes, it's here. The Digimac One you've been waiting for. The youngest of the MacGregor proportional radio controls. The cheapest of the range. Cheap that is at the low, low price of £39.50, but not in quality. It's still got the MacGregor name to live up to for reliability and rugged construction, with the finest of after sales servicing on tap.

Built and developed wholly in the UK, specifically for those new into radio control. It gives you a lot more guidance for a lot less money.

Remember that the Digimac One, like all the MacGregor proportional combos, can be converted to take up to six channels. With a Digimac One, you've really begun!



**MacGregor
Radio
Control**

Canal Estate, Langley, Berks SL3 6EQ

Available from your local stockist.

NEW KITS from



'NEW LOOK' models, brilliantly design-engineered with accurately die-cut and shaped wood parts, hardware items, etc. Each kit also includes a FULLY DETAILED PLAN & assembly instructions. DISTRIBUTED BY RIPMAX MODELS.

CONTROL LINE



SCOUT
21" span

Sleek, speedy – and really easy to build. Designed specially as a trainer or sports model for .75-1cc engines. Preshaped parts, hardware, wheels and spinner included. No soldering reqd. Price £3.95



KIT CONTENTS

Sheet balsa fuselage and tail parts fully shaped; moulded cowling blocks; die-cut wing ribs, etc. Shaped ply and wire parts, bellcrank, horn, wheels, acetate sheet, tissue, etc. . . plus sheet of decals. Everything you need to complete the model except cement and colour finish.

HURRICANE

28in. span semi-scale models for I or I.5cc engines featuring really easy assembly, realistic appearance (clear canopies for example). Full aerobatic performance on I.5cc engines. Semi-enclosed sidewinder engine makes them different from other profiles!

each model price £4.40
and FW190



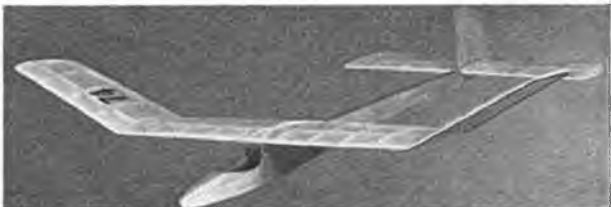
ALSO COMING IN THIS RANGE

28" span SPITFIRE 28" MESSERSCHMITT ME 109



HOBO
28" span

All sheet and every part fully shaped ready to go together. Predecorated, too . . . assembles ready to fly in an hour! Fully cambered wing and tail. Easily adapts to ELECTRIC F/F power (Mabuchi A1). Price £1.85



MERLIN
33" span

Built-up wing and tail for light weight and high performance. All sheet fuselage, clear canopy. Kit includes everything (except cement). A superb towline trainer! Overall length 21". Price £1.65



PETREL
43" span

Stable and really pretty in flight – with a fine soaring performance. Die-cut ribs, precut fuselage parts, etc. Model conforms to the A1 contest spec – an ideal club design! Overall length 27". Price £2.65



MISTRAL
55" span

Continental-style open class high performance towline glider with built-up wing and tail, sheet fuselage construction (all parts die-cut). Features D/T tail and auto-rudder. Price £3.65

SEE THEM ALL AT YOUR MODEL SHOP

KINDLY MENTION 'AEROMODELLER' WHEN REPLYING TO ADVERTISEMENTS

Heard at the HANGAR DOORS

THE ALL-ROUNDER, that aeromodeller who dabbles at all classes from control line speed to FAI free flight and radio controlled aerobatics is a comparatively rare animal. Especially the really successful exponent. New Zealand, Australia and the USA can nominate a few names that would qualify for a sort of aeromodelling Pentathlon, but European countries have become so specialised that the interests of the C/L, F/F, Scale and R/C are regarded as conflicting rather than complementary. All the more interesting therefore, is the latest achievement of Sweden's Rolf Hagel.

We've known Rolf as a C/L speed flyer, FAI Power Champion, highly skilled team manager and engine tuner of repute for many, many years. Now Rolf has turned his hand to cable car racing and within months has shattered the Italian-held world record for 2-5cc by 8km/h with a speed of 253.30km/h (158mph) using his own modified Super Tigre X-15. Rolf tunes his engines to peak at 30,000 rpm! He also equips other Swedish cable-racer enthusiasts with Hagel - OPS conversions for 5cc and 10cc classes. Congratulations to this skilful engineer, whose talents do so much to inspire others in modelling.

MODEL FLYING FIELDS ASSOCIATION is the proposed title for a London based organisation created to protect the interests of model flyers. The aims of this independent non-profit making association are to improve the status of model activity, to issue a directory of clubs and flying sites, to help members to obtain flying areas and to retain them. The MFFA will have expert knowledge available for negotiation with local authorities and would provide assistance through a retained secretary.

First reaction will inevitably be why not through the SMAE? The Society of Model Aeronautical Engineers is already involved in identical procedures, covering all of the nation. As the organising body, recognised by the Department of the Environment and Home Office, the Ministry

of Defence and Civil Aviation Authority and the CCPR; the SMAE has already sustained the rights of numerous clubs, and protected the interests of all modellers whose public open spaces have been threatened with restrictive bye-laws. The recent *Model Flying* newsletters emphasise this effort, and have given a detailed account of the processes affecting

model sites in the Greater London Council area of administration.

The SMAE has a heavy work load ahead in dealing not only with flying areas and local authorities but also the implications of the Noise Abatement Act and the now ominous Control of Pollution Act. Any complementary effort such as the proposed MFFA would go a long way to meeting the demand for proficient representation of interests. Duplication would be disastrous, co-operation could be constructive for everyone.

The concept of the MFFA is at present in the formulative stage. London and the Home Counties readers who are interested in joining are invited to make application (proposed fee is £5 for membership) or enquiries and opinions can be forwarded by us if sent care of the Editorial Offices.

F.A.I. CALENDAR

(Provisional)

for control-line and free flight contests

WORLD CHAMPIONSHIPS

18-25th	Sweden	<i>Control Line scale: (with R/C scale and Pylon)</i>
June	Dalama	
7-12th	Netherlands	<i>Control Line: F2A, F2B, F2C</i>
July	Utrecht	
27-31st	United Kingdom	<i>Indoor: F1D</i>
August	Cardington	

CONTINENTAL CHAMPIONSHIPS

18-20	Czechoslovakia	<i>Model Rockets FAI International Competition</i>
June	Dubnica nad Vahom	
28th July-	Yugoslavia	<i>European Championships: F1C</i>
2nd August	Zagreb	
10-12th	German Fed. Rep.	<i>European F/F Championships: F1A, F1B</i>
September	Homburg/Saar	

OPEN INTERNATIONAL EVENTS

3-4th	France	<i>'Concours International de Combat Sportif': F2D</i>
April	84460 Cheval-Blanc	
8-9th	German Fed. Rep.	<i>2nd International Combat Contest: F2D</i>
May	Oberhausen	
29-30th	Czechoslovakia	<i>International Competition for Rocket Models</i>
May	Dubnica nad Vahom	
29-30th	Austria	<i>'International Fesselflug-Cup 1976': F2A, F2C</i>
May	Kraiwiesen, Salzburg	
20-30th	Netherlands	<i>Free Flight: F1A, F1B, F1C</i>
May	Rozendaalse Heide	
19-20th	German Fed. Rep.	<i>VIII Eiffel Cup: F1A, F1B, F1C</i>
June	Drove	
3-4th	German Fed. Rep.	<i>IX International Contest Munchen: F1A, F1B, F1C</i>
July	Munchen	
3-4th	Netherlands	<i>Combat International Rotterdam 1976: F2D</i>
July	Rotterdam	
16-19th	Spain	<i>'Garcia Morato' International: F1A, F1B, F1C</i>
July	Lerida	
23-25th	Hungary	<i>Macek-Cup: F2A, F2B, F2C</i>
July	Pecs	
2-7th	USA	<i>AMA National Championship: F1A, F1B, F1C</i>
August	Dayton, Ohio	
28-29th	Czechoslovakia	<i>International Competition: F2D</i>
August	Brno	
28-29th	Belgium	<i>International Contest AMV: F2A, F2B, F2C</i>
August	Verviers	
18-19th	German Fed. Rep.	<i>International Fesselflug-wettbewerb Bochum: F2A, F2B, F2C</i>
September	Bochum	
2-3rd	Netherlands	<i>Criterion Midden Nederland VIII: F2A, F2B, F2C</i>
October	Utrecht	
8-10th	Hungary	<i>Nyirseg-Cup: F2A, F2C</i>
October	Nyireghaza	



BOEING F4B - 4

a colourful, $\frac{1}{8}$ th scale control-line model of the famous U.S. Navy fighter for 0.40-0.50 cu. in. motors
by Ron Truelove

THE BOEING F4B-4 is an attractive scale subject and, following construction and flying experience gained from a 44in. span C/L sport biplane, several features were incorporated in this version, which, at 1:8 scale, has the advantage of being a one piece model without being too cumbersome to transport.

The wing/strut/fuselage connections seemed from the previous model to be the key to the basic structure and it appeared that the following arrangement would be most satisfactory. It will be noted from the drawing that the lower wing halves are fitted onto the bottom fuselage taking their dihedral braces from the $\frac{1}{8}$ in. ply former F4, whilst the upper wing, which is flat and in one piece, has its main spars securely fixed by 14swg piano wire to formers F2 and F4. This forms the basis of the wing/fuselage connections, and the interplane struts, aileron link rods and wing bracing wires are for appearance only and are therefore, only lightly glued in place. This system was proved on the sport biplane when it inadvertently landed on its right lower wing and completely demolished it, but left the remainder of the airframe unscathed.

Other features include a drooping undercarriage, which consists of lightly sprung telescopic legs – the spring assisting drooping only. Stronger springs, incidentally, would produce an unwanted bouncing effect upon landing. The glow motor, mounted inverted to reveal as little of itself as possible, was fitted with a home-made internally situated silencer, but this is something of a luxury as it takes a lot of precision machining to produce, and a commercial silencer (shown on drawing) is permissible in competitions anyway.

A standard *Roberts* three line system with upright plane unit (bellcrank) provides the linkage to the engine's throttle control, a must for this type of model. The scale spacing of the ribs adds a lot to the appearance of the model and is much easier to achieve than first appears, given a little organisation. . . . The first items to build are the construction jigs for the built up ribs R2 and W2 (see sketch), so that to save time these ribs can be built during the construction of the fuselage. The jigs, consisting of $\frac{1}{8}$ in. ply mounted on a softwood base, are well waxed with a candle before each rib is glued in place. To make the ribs, the two $\frac{1}{8}$ in.sq. upper strips are glued together and pinned in place first, followed by the short strips (and triangular TE piece on W2), and finally the lower strips. The assembly is then put aside to dry, whilst attention is turned to the fuselage construction. By this method, the ribs can be built slowly without really wasting any time – when each rib is thoroughly dry, the pins are removed, the ribs cut to size, following lines marked on the jig, and carefully removed, ready for the next one. Thirty W2s are

required and 22 R2s, plus a few spares of each.

The fuselage is started by cutting formers F1 to F9 marking centre lines on same. Drill F1 to suit the engine mount, throttle pushrod and tank pipes, then assemble mount to former, and epoxy anchor nuts to the rear face. Remove mount when epoxy is set.

The plan shows two types of undercarriage: fixed or drooping. Select your choice, then bend 12swg main wire (one for fixed U/C, two for drooping) and bind with terylene cord and epoxy to F2, together with the 14swg front cabane wire, and 14swg centre U/C brace (one piece for fixed U/C, two pieces for drooping). Likewise the 14swg rear cabane strut wire is bent up and bound to F4 (note forward joggle shown on side view), but not epoxied at this stage.

Cut the $\frac{1}{8}$ in. ply bellcrank mounting plate and screw to the *Roberts* plane unit. Bend leadouts as shown and assemble to bellcranks. Cut $\frac{1}{4}$ in.sq. spruce bearers to length and mark positions of formers. Next dry assemble F1 to 5 to bearers, together with tank and bellcrank plate, and when satisfied slide each former slightly out of position, one at a time, epoxy and slide back – not forgetting the bellcrank. Check assembly for straightness and squareness, fuelproof front of F1 and put aside to dry.

Glue $\frac{1}{4}$ in.sq. crutch members to F3, 4 and 5. Check alignment and allow to dry. Pin scrap $\frac{1}{4}$ in.sq. temporary spacer across crutch at F5 and glue tail ends of crutch together – check alignment. Mark positions of formers F6-9 on crutch and glue in place, together with the tail wheel bracket and one $\frac{1}{4}$ in. x $\frac{1}{4}$ in. planking strip on underside to hold formers square. Remove temporary spacer when dry.

The tailplane is made from $\frac{1}{4}$ in. sheet, hollowed out, or



built up from $\frac{3}{8}$ in. thick strips, and when dry is rough shaped and sanded and the $\frac{1}{8}$ in. sheet rib pieces added. The tailplane is glued to the top of F9 and the rear of F8. Check alignment and squareness. The elevators are made from $\frac{3}{8}$ in. sheet, hollowed out or built up, plus $\frac{1}{8}$ in. sheet ribs similar to tailplane. Hinge with nylon hinges, and join with horn assembly as shown. The $\frac{3}{8}$ in.sq. pushrod has a fixed metal quick link at the front and an adjustable one at the rear; these are securely bound and epoxied in place. The pushrod is then inserted in the fuselage from the tail end, clipped in place, and the elevator control is set up and adjusted.

The fin and rudder are then cut from $\frac{3}{8}$ in. sheet, sanded to shape and the fin is glued to the top of the tailplane and rear of F8, and the rudder to the rear of the fin. Note offset! Once more check for alignment and squareness.

The 16 swg throttle pushrod is now connected via a fixed metal quicklink to the *Roberts* bellcrank, the other end being dealt with later. The 14swg diagonal cabane strut wire can now be added, being bound and epoxied to F4, and bound with fusewire and soldered to the front cabane strut wire. Plank the fuselage with $\frac{1}{2}$ in. x $\frac{1}{8}$ in. strips. (It is recommended that any cockpit detail required be added before the final planking of the cockpit area).

Position engine mount on F1 and offer up the engine to determine position of engine mounting holes on the beams. Drill to suit and file flats where holes appear on the other side of the beams, to take nuts which are epoxied in place (the inner parts of 'floating' anchor nuts have been found most useful). The removable cowl will be retained by a 'Dzus' quick release fastener. This type is preferred because it pulls in as it locks, and requires a wire clip

which can be made to suit almost any application. The fastener 'stud' in the Boeing is fitted to a small $\frac{1}{8}$ in. ply plate by drilling in it an undersize hole and pushing the plate right home onto the small neck of the stud. The plate is then epoxied to the front of F1A, the wire clip being bent up and secured under the two lower engine mount fixing screws.

With former F1A, the engine, and mount in position, the cowl blocks can be carved and glued into place together with the dummy engine cylinders. The cowl joint is preferably cut after the blocks have dried.

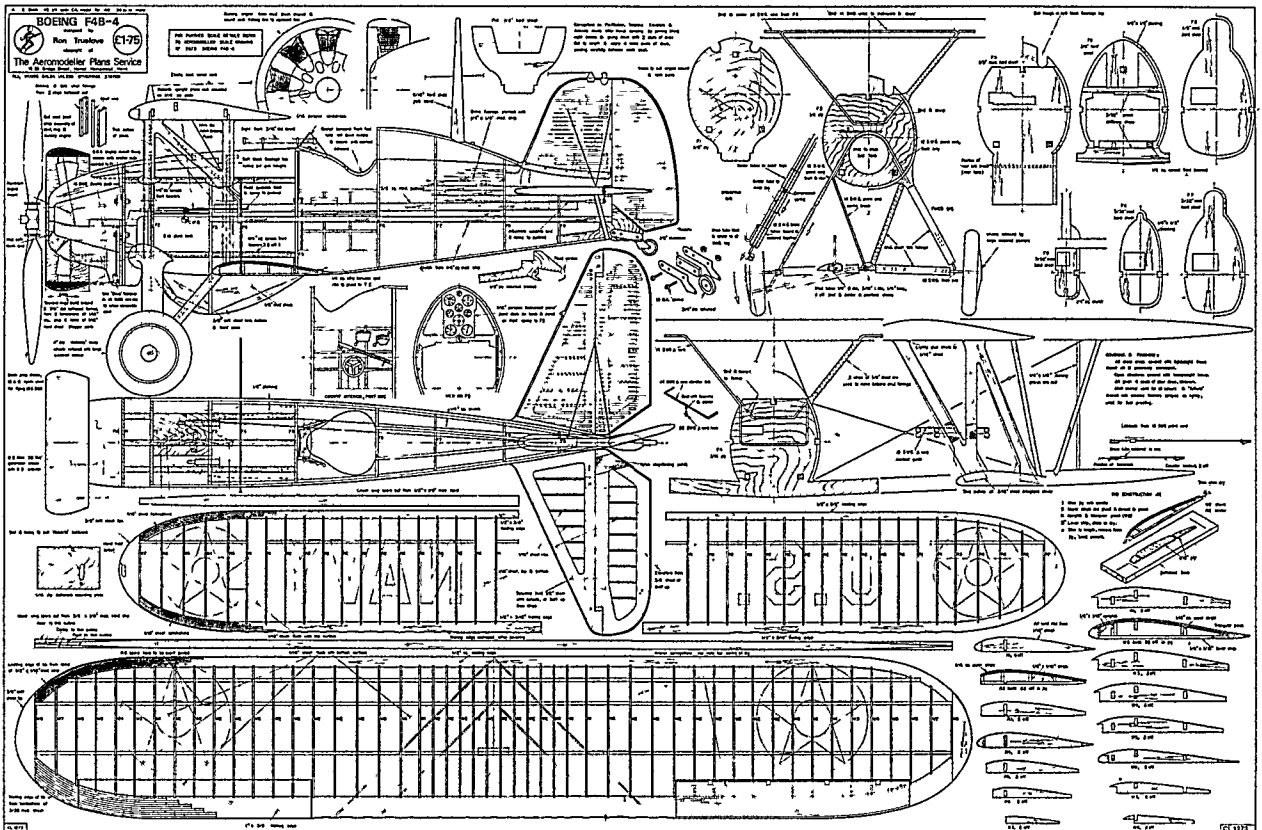
The townend ring is built around a softwood former made from pieces of 2in. x 2in. glued together, rough carved and finished on a drill with a lathe attachment. (I later used this former for the core of a line reel.) The ring consists of three inner laminations of $\frac{1}{8}$ in. ply plus four laminations of $\frac{1}{8}$ in. hard sheet, all with their grain running across the width and their joints suitably staggered.

While this is drying the adjustable throttle link can be fitted to the engine and pushrod. When dry, the ring is shaped to the section shown and glued on to the dummy engine cylinders, the joint not being cut until all is thoroughly dry.

The undercarriage should be next, the fixed version being fairly straightforward, the 10swg axle having all the other legs and struts bound and soldered to it. The drooping version has a two piece axle, pivoted at the centre and sliding in a tube at the bottom of the telescopic leg. The leg consists of three 12swg wires, two previously fixed to F2, and the third sliding up and down, using the ply former as an upper stop.

continued on page 108

FULL SIZE COPIES OF THIS 1/9th SCALE REPRODUCTION ARE AVAILABLE AS PLAN NO. CL1273 PRICE £1.75 (INCLUSIVE OF VAT AND POSTAGE) FROM AEROMODELLER PLANS SERVICE, PO BOX 35, BRIDGE STREET, HEMEL HEMPSTEAD HERTS HP1 1EE





FOR TEN YEARS we organised an AeroModeller team of Coupe d'Hiver flyers to take part in the annual event near Paris, but February '75 came and went – and there was no contest. The International Challenge had become such a tradition – something *had* to be done to fill the void, so why not bring the XXXIst event to Britain?

Maurice Bayet, creator of the class and publisher of *Le Modele Reduit D'Avion*, who sponsored the contest for what to many people is a lifetime, agreed with alacrity. "You are welcome" was his quick response, and so, through the kindness of the Royal Air Force, all roads led to Halton on 30th November.

Alas! The fog which assured our French contingent was "a thing of the past", blanketed all of Southern England. Worse still, there was no sign of a breeze developing to clear the greatly restricted visibility (50 yards maximum)

while the temperature hovered around the zero mark. Hardly an inspiring start, despite the pre-entry list of over seventy models.

Peering through the gloom, it could be seen that the apron in front of the hangars was gradually filling with cars and essential modelling paraphernalia, while the owners stamped around trying to keep their circulation going. By mid-day visibility had improved by 100% (sounds good, but that is still only 100 yards!) so a start had to be made, as less than 4 hours of daylight remained.

Jokingly, Pierre Chaussebourg suggested that we might run a contest where the timekeeper chased the model and brought it back to the flyer with the score. In reality we almost did just that. Drift was so slight that the rules could be amended to allow the timekeepers to walk underneath the model during flight – a decision welcomed both by flyers and timekeepers, who found that the exercise at least kept them from being frozen to the ground. In practice this system worked very well, the 3mph drift kept models from travelling very far, and upward visibility at least remained fair, though many of the dethermalised flights were only just within marginal vision.

The air seemed quite buoyant, as a couple of chuck gliders flown that morning had shown, despite the cold, an R/C electric model had earlier come to grief when controls froze in the full-left position!

In order to satisfy all Coupe d'Hiver interests, two separate events were organised, each with separate trophies. Maurice Bayet had generously donated a fine Coupe de Paris 'pot' for a contest to be run to the 'French' rules (i.e. three flights with a two-minute max. for 100 gramme models to be launched ROG) while *AeroModeller* presented a trophy for the FAI class (80 gramme model, five two minute flights, hand launched). 'Trophy' hardly describes the magnificent piece of art produced by Ian Dowsett, consisting of an exact-scale Coupe d'Hiver model made from brass, silver plated and cast in clear acrylic by Stanley Plastics, truly leaders in their field. The ingenious part of the trophy, which transformed it into an art piece, was the way in which the acrylic was shaped, enabling up to four, undistorted views of the model to be seen when looked at from different angles.

Though what might well have become a farcical situation in the limited visibility was converted to a surprisingly pleasant though cold experience, the fog did apply one regretted restriction. This was the way in which it tended to hide the remarkably professional approach of the French experts. From literally nowhere, they produced 20ft. thermistor masts, floating drift streamers, shelter tents, all-weather gear and their characteristic solo winding stakes. When they flew it was a revelation. Results alone indicate how skilful is their approach.

Those who flew early certainly did not regret it – Pete

Two stage panorama in heading illustrates visibility at its best! Scattered groups grope in the clag.

Victorious Frenchmen, Louis Du Puis and Bernard Boutillier with their respective trophies, at left.





1. Ian Dowsett had a rough time busting motors. 2. Pierre Chaussebourg bides his time for Bob White. 3. Dave Goodwin ROGs Charlie Sotich's. 4. Bruce Rowe and Dick Johnson look after Fudo Takagi's. 5. Claire brought Parisienne charm with Brian Cox. 6. Georges Matherat's giant. 7. Dave Greaves named his after a Brewery. 8. The maestro DuPuis with 'Ze Bul'. 9. Peter Cameron and son, first to max. 10. Ian Sutton prepares. 11. Steve Marriott's Kung Fu midwing. 12. John O'Donnell took Frank Monts to 3rd. 13. Bob Wells found late max's for 6th. 14. Alain Roux shows how to self-wind.



Ron Moulton (left), Brian Tew (centre) and victorious Louis DuPuis, the undisputed King of Coupe d'Hiver collecting the A/M Trophy. Right, the sympathique Maurice Bayet, donor of the MRA Cup and founder of Coupe d'Hiver.



Cameron had the honour of being first to fly, and the first to record a max. Len Ranson flew just seconds later, but underestimated both the conditions and his model by not lighting the D/T fuse. Result? Out of sight vertically after two minutes! Fortunately, his model was found later in the afternoon, though too late for further contest flying with that particular machine. Actually, despite the 266 recorded flights (at the rate of a launch every 45 seconds!) only four models were not recovered.

As the day progressed, the wind direction, such as it was, veered considerably and the better air either vanished or became much harder to find – the majority of the maxes recorded (and approximately 30% of all flights were maxes) were made before 2pm. It soon became clear that the French with their huge models were in a class of their own, recording two minute flights with almost regular monotony. True, their models suited the conditions perfectly, but these designs of around Wakefield proportion were certainly better than anyone might have expected.

One might say the British were 'Duped' by the dedicated pair of DuPuis' from Chatelleroux. Louis (like all others from France) was deliberately flying at over 100 grammes weight in the 80gr. class to ridicule the claim that the 20 grammes makes any difference. In fact, he won the 80gr. class with a 107gr. model, came 2nd in the flyoff and 4th in the 100gr. class to tot up 10 maxes in eleven flights. He was beaten only by French C.d.H. Champ Bernard Boutillier with a better flyoff decider and even then with his own motor which he sportingly loaned. Claudine had the misfortune to lose her only model in a first flight 'max'.

As dusk fell, ice was wiped off propeller blades, broken motors packed away (Ian Dowsett, trying so hard to recapture the trophy he had made created something of a record by breaking 14 motors), and the exhausted, thoroughly chilled competitors made their way to the Sergeants' Mess for the prize-giving – and a warming drink.



which was *not* of the coffee variety. The prize list extended to every competitor in the 'French' event, and to the first 26 in FAI, so very few went home empty handed, thanks to the generous support of MAP, Ripmax, Solarbo, Irvine Engines, Humbrol, Keil Kraft and Henry J. Nicholls. Another 'Coupe' tradition had been upheld!

Was it worth it? Most certainly – as organisers we were amply rewarded by the overwhelming response of 67 entries, and by the expressions of thanks by those who enjoyed their trials and tribulations. All in fact went home satisfied and happy – what more can you ask? Our thanks of course to the Station Commandant plus his Officers Brian Tew and Stewart Funnel for the excellent facilities and their hard work, plus the timekeepers from the Aylesbury and St Albans clubs (not forgetting George Lynn of course) for their efforts in the inclement conditions. Our only sorrow concerns the fog – now the French will *never* believe that such conditions are other than the 'norm' for November in Britain . . . !

Results

100gr (MRA Challenge)				
1. B. Boutillier (France)	120	120	120	+113
2. L. DuPuis (France)	120	120	120	+ 88
3. F. Monts (USA)	104	79	120	303
(Proxy J. O'Donnell)				

continued on page 79

Dave Linstrum (right) started his Coupe in Saudi Arabia, finished it during overnight stay with his proxy, Pete Cameron (centre) and brought it to AeroModeller offices the next day to show Editor Peter Richardson (left). Placed 15th. By then, Dave was in Florida - or was it Los Angeles before returning to London, Paris and points east - ah well!

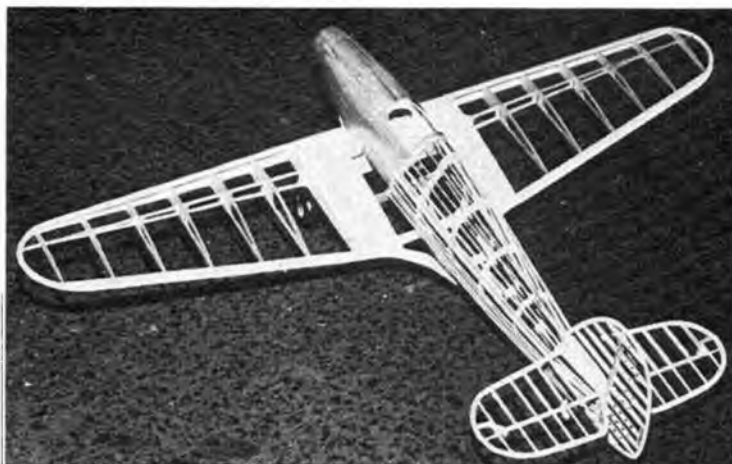


The 'Complete Aeromodellartist'. Bernard the Bout self-winds the Coupe 'Mamma' sheltered in lean-to tent, also protecting his leather model box. (ex-Bugatti luggage!)

FLYING SCALE COLUMN

by Eric Coates

John Blagg's indoor scale Hurricane under construction - note the efforts to save weight evident in the lightened wing and rudder ribs. Lightness is of course the 'secret' to successful scale flying of all types - careful wood selection can mean all the difference, and cannot be stressed enough.



NOVEMBER 2ND saw the close of the 1975 SMAE Scale Contest calendar with the Indoor Meeting held in the Cardington Shed. Only one event was scheduled; open scale which attracted a fair entry. A close tussle developed for the first three places. After the static judging two models had a substantial lead over the rest of the field - Alan Callaghan's well known *Udet Flamingo* with 162 points and John Blagg's *Renard 17* with 150 points. Neither of these models, however, could be persuaded to take off and remain airborne for the required 15 seconds. Both, in fact, qualified by means of hand launched flights to record mediocre flight scores of 112 and 108 respectively. Best flight of the day was recorded by M. Sanderson's *A.B.C. Robin*, a prototype which possess ideal proportions for a stable scale model. Good flight performance was achieved, as ever, by lightweight construction. The model was neat and simple with coloured tissue covering which, naturally, resulted in only a modest static score, but nevertheless the 168 flying points pushed it into joint second place overall with Andrew Callaghan. The winner was the well known *Hornet Moth* of Mike Reeves (the Whitefield one). This large geared model always flies well, with a nice long take off followed by a stable steady flight. All three flights on this occasion were not without incident: the first two had the microfilm boys, who were trimming in the same hangar, fleeing for their lives, clutching their featherlight creations, as the heavyweight de Havilland monster bore down on them. The last flight was even more confusing as it coincided with a trimming flight I was making with my CO₂ powered *Curtis Robin*. Both models flew wide low circles in opposite directions scattering the scale pits and the judges in all directions as they were straffed simultaneously in both directions. Amazingly nothing was struck and both models landed unscathed on the hangar floor.

I did not make an entry myself. I had spent the previous fortnight rebuilding my ancient black *Hurricane 1* into a Mk. IIc Intruder. This entailed completely new wings and tailplane, a complete recover and a much more ambitious paint scheme. Unfortunately, the weight went up and the trim was lost. Only completing the machine the night before I had no time to re-trim and after a few attempts I decided not to pursue the matter that day - Cardington

At top is Vic Willson with his successful 'wireless to wires' conversion of Mick Reeves' Fournier RF4 design, which won the Class 2 R/C event at the '75 Nationals. Vic's C/L version weighs 9½lbs. for its 126in. wingspan and runs on HP 61 for power. Flying speed can be varied from 25-30mph - the scale speed being 30-35mph - ideal! At right is the Coates' rebuilt Hurricane 2C. This 20in. span rubber powered craft was originally from the Keil Kraft kit, but now only the aft fuselage remains original.

hangar floor is too hard to trim a heavyweight low wing job over. John Blagg is also engaged in the construction of a *Hurricane*. It will be a lot more accurate and lighter than mine which should make for easier trimming. I think a little more dihedral will be called for though John!

I spent most of the day trimming out my CO₂ powered *Curtis Robin* mentioned earlier. This 18in. span model has been built from one of the Tern Kits I reviewed in my July 1975 column. This has been fitted with one of the latest Brown CO₂ motors and flies very well. It will turn in very tight left hand circles and could be made to perform in far smaller halls than Cardington. It is also very stable and will fly outdoors remarkably well in quite strong winds for such a tiny model. I will give details of the CO₂ conversion in a later column but would just like to say how enjoyable a construction exercise building this kit was. The fuselage is far from straightforward with the joggle in the forward part near the windscreen. One black

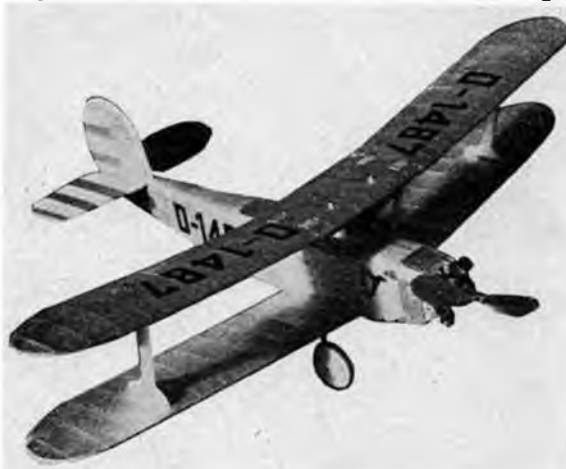




M. Anderson's ABC Robin which was placed second at the November 2nd Indoor meet. The ideal proportions of this aircraft combined with its lightweight resulted in the best flying points, although the coloured tissue finish employed to economise on weight resulted in only average 'static' points. You cannot have it both ways!

mark though. The built up balsa wheels with 'O' ring tyres are quite useless — after only a couple of landings they collapsed. I have now fitted plastic ones, not quite scale but a darn sight more serviceable.

The Cardington meeting brought to an end the 1975 SMAE Scale Contest season and, therefore, this signals my annual review of the British Scale scene. Although



Andrew Callaghan's Udet Flamingo, voted by our columnist as the 'Indoor scale model of the year'. Placed joint second at the last Indoor meet of '75.

on the whole one must look back on the summer as being one of the better years for weather, with several weeks of hot calm in the middle period, unfortunately the SMAE,

with unerring accuracy, managed to pick the worst Sundays on which to hold its scale competitions! Mind you, the Old Warden day organised by MAP was even windier than most of these . . . Apart from the Nationals, which was well supported (oversubscribed as far as Class 2 R/C was concerned) entries were somewhat down on previous years. This could be a combination of poor weather and the high price of motor fuel. Personally I have been more involved in competing than in the previous year and although still remaining Chairman of the Scale Technical Committee I managed more successfully to delegate much of the field organisation. This enabled me to fly in all the F/F comps. and, for the first time, a selection of R/C events.

The outstanding piece of construction I have seen, in any class, was Derek Vaughan's *Wirraway*. The internals of the fuselage, when viewed from the open canopy, are really a work of art. Unfortunately though engine problems and unreliable U/C locking mechanism prevented it making any decent flying scores so negating any chances of making an overall winning score. When considering new radio models overall performance, i.e. static and flying, my No. 1 spot, for the third year in succession, must go to Brian Taylor; the model this time being the *F.W. 190A4*. Built purely for Class 2 competition this has proved to be a very reliable machine despite the occasional U/C leg collapse on landing. The 190's long legs put a tremendous strain on any downlocks if there is any sideways drift on the model at all. Not quite ready for the Nats this model won practically every competition it entered in the midsummer period, including the SMAE Midsummer Scale meeting and Southern Gala, before Brian reverted back to flying his *Spitfire 1a* again in the Autumn. Although only possessing rudimentary internal detail, the 190 was well up to Class 1 standards for external finish with all rivets and panel lines incorporated. Brian has just published the plans for this fine model and I can recommend it to anyone wishing to build an accurate practical working model of this relatively easily constructed W.W.II fighter.

Very few new freeflight models of note flew in outdoor competitions this year. A lot of new models were about but very few looked as if they would offer a contest challenge. I thought my old *D.H.9A* which has now completed its fourth contest season would have been completely outclassed this year, but this was not so and surprisingly it won four out of the six competitions it was entered in. Terry Manley won the other two, using his equally venerable, although not so reliable this year, *D.H.4* at the SMAE Midsummer Meeting and his new model, the *Blackburn Sprat* in the Eddie Riding event at Woodford. This model receives my accolade as the best new F/F model of the season. It was very well constructed with all the fine dummy engine detail usually associated with Terry's models. It does in fact fly very well, I am assured by Terry, but in the windy contest conditions I have seen it perform its take off performance left a lot to be desired. Its flying scores, therefore, were rather low.

Terry Manley's superb Blackburn Sprat, looking oh-so-realistic, and not surprisingly receives the Coates accolade of 'free-flight scale model of 1975'. Once more, no prizes — just an honourable mention!



I had very little time to observe control line models in action this year. Therefore, in ignorance I would not like to pass judgment. Let me say I thought the best looking model was the *F.W.56* of Mr Skinner and the best performer I saw was undoubtedly Wal Cordwell's large yellow *Avro Tutor*.

Indoor flying has been dominated by the Peanut model this year. The performance of these 13in. span miniatures has risen astronomically so that flights of approaching a minute are now quite commonplace. Unfortunately I see a trend setting in for models becoming very stereotyped as is inevitable with a duration type competition. It has been found that models of American homebuilds such as the *Whittman Tailwind* or 'Big Ajaxes' as I term them fly most stably and the longest. This is not surprising as by their very nature most of them resemble low aspect ratio cabin duration models of 30 years ago. I suspect that probably most of their designers made rubber driven cabin duration models 30 years ago! I hope this trend does not continue and that possible modification to the rules can allow more complicated and interesting prototypes to compete on even terms.

For the third successive time, Brian Taylor wins Eric's admiration for producing the best R/C scale model of the year - in this case the Focke Wulf 190 A4. Plans now available from the 'Digi Hangar'.



Our columnist built this Curtiss Robin from the Tern Kit, and installed one of the latest Brown Junior CO₂ motors. A really nice flyer and a joy to build - details of the CO₂ conversion to appear in the near future.

Butch Hadland has undoubtedly become England's leading Peanut flyer; winning all the competitions held for this class at Cardington and giving a very good account for himself also when competing in the USA. Butch has been concentrating on the 'big Ajax' type of model recently but earlier in the year he was flying a beautiful *Blackburn 1912* - that most flyable of pre 1914 subjects. He has published the drawings for this model now, and it is this machine to which I award my accolade of 'best peanut of the year'.

The more serious side of indoor scale modelling has been dominated by two modellers - Alan Callaghan and John Blagg. John has produced a number of very interesting prototypes - many of which I have illustrated in these pages with throughout the year. Unfortunately the flying performance of these beautifully detailed little models has left a lot to be desired and John has often been hard pushed to make the qualifying flight time from a hand launch let alone ROG. Although not a brilliant flyer Alan's *Udet Flamingo*, mentioned earlier in this month's column, won two out of the three open indoor events this year by reason of its superlative construction. This really is (was) a beautiful model. Unfortunately on its last outing a rubber breakage blasted out the sheet fuselage side. This model, therefore, is awarded the last of my 1975 accolades.

THE GHOSTLY COUPE

continued from page 76

4. L. DuPuis (France)	83	84	120	287
5. D. Greaves	99	92	79	270
6. G. Matherat (France)	70	120	62	252
7. G. Matherat (France)	120	120	—	240
8. R. Moore	60	56	120	236
9. R. White (USA)	71	78	85	234

(Proxy P. Chaussebourg)

10. A. Wells	76	78	65	219
11. D. Linstrum (USA) 214 (Proxy P. Chaussebourg); 12. R. Moore 208; 13. C. Sotich (USA) 207 (Proxy D. Goodwin); 14. P. Chaussebourg (F) 205; 15. S. Millott (F) 203 (Proxy A. Roux); 16. A. Roux (F) 199; 17. S. Savage (Canada) 195 (Proxy I. Dowsett); 18. P. Boutillier (F) 194; 19. P. Freebrey 179; 20. R. A. Twomey 169; 21. D. Roche 167; 22. I. Sutton 140; 23. S. Savage (Canada) 142 (Proxy I. Dowsett); 24. L. Ranson 66; 25. R. A. Twomey 44; 26. I. Dowsett 39.				

80gr (AeroModeller Trophy)

1. L. DuPuis (France)	120	120	120	120	120	600
2. G. Matherat (France)	120	120	106	120	120	586
3. H. Tubbs	120	120	70	120	120	550
4. D. Hipperson	20	120	120	78	108	546
5. J. Cooper	120	120	120	70	115	543
6. A. Wells	79	100	120	120	120	539
7. S. Marriot	120	120	83	109	90	522
8. R. White (USA)	120	120	110	97	72	519

(Proxy P. Chaussebourg)

9. J. O'Donnell	120	120	87	94	97	518
10. G. C. Hart	115	106	120	118	54	513
11. R. Elliott 505; 12. B. Boutillier (F) 504; 13. P. Cameron 503; 14. P. R. Bixby 491; 15. T. Linstrum (USA) (Proxy P. Cameron) 479; 16. P. Chaussebourg (F) 476; 17. I. W. Kaynes 470; 18. I. Dowsett 461; 19. D. Greaves 457; 20. B. V. Rowe 455; 21. A. Roux (F) 449; 22. R. Fleetwood 444; 23. Fudo Takagi (USA) (Proxy R. Johnson) 436; 24. R. Coleman 432; 25. R. Johnson 431; 26. S. Millett (F) (Proxy A. Roux) 407; 27. W. Houghton 401; 28. P. Freebrey 397; 29. G. Ferer 387; 30. A. Crisp 373; 31. P. D. Taylor 372; 32. M. Cowley 370; 33. J. Wright 367; 34. S. Taylor 330; 35. D. Roche 325; 36. D. Bell 312; 37. Foster 308; 38. R. Moore 273; 39. B. Cox 208; 40. L. Ranson 121; 41. Mme C. DuPuis 120.						

David Greaves and Bob Wells at the 'take your choice' prize table. Dave took the kilo of Fillati rubber.



BETWEEN THE LINES



with Dave Clarkson

A real treat for speed flyers is available from World Engines, in the form of a kit for Amato Prati's 'New Speed King' design. The fuselage consists of nicely moulded glass fibre shells which must be epoxied together (adhesive supplied) but the star feature must be the wings - beautifully formed from sheet alloy, thus taking all the headaches out of building such a model. In addition there is a cast magnesium pan - ready drilled and tapped - plus an alloy spar over which the wings slip. Only balsa component is the tail-plane. Price of this superb item for the specialised modeller is £18.25 - very good value for money considering the amount of preparation and the limited market to which it will appeal.

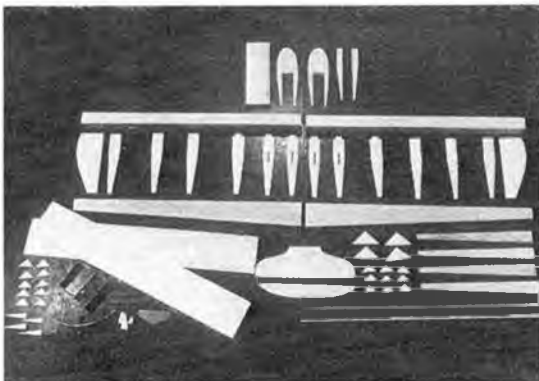
In fairness to our Columnist, it should be explained that his 'Viewpoint' feature below was written before a sudden influx of kits and accessories arrived at the Editorial Offices, hence the apparent conflict of opinions expressed and the accompanying photographs.

VIEWPOINT - IS THE MODEL TRADE SERVING CONTROL LINERS WELL?

In writing this I suffered a little difficulty in trying to take a fair and balanced view, for I am not an 'average' control-line modeller. Nevertheless I have tried hard to be fair, and apologise if some of the following seems harsh, however it is the result of as honest an appraisal of which I am capable. I do not believe that it is in anyone's interests to avoid criticism where such seems warranted, for only by voicing criticism constructively can improvement result, and better products and services must surely result in more active modellers.

Beginners Many aeromodellers, especially the (relatively) impecunious young, start off their interest with a control-line model. All too often, the lad chooses for his first models a 'Plastic Nasty' - an American term, not mine. The 'Plastic Nasty' is an expensive, but nice-looking assembly of a very tricky little glow motor and a very difficult to fly model. Just how many of those who recommend and sell these models have actually flown one? Come on, be honest if you a grown adult cannot fly one easily, just how is the young beginner going to manage? Besides the 'Plastic Nasty' there are numerous basic trainers on the market. I have yet to see one that is a real success in terms of flying characteristics and robustness, indeed the last basic trainer I was handed 'to see if it was OK', proved extremely difficult to keep in the air and yet had been built quite faithfully according to the instructions. The Terylene lines frequently sold as 'suitable' merely aggravate the problems because of their high drag and elasticity - reduced line tension and very 'mushy' control. I am sure that much improved basic trainers that

New combat kit from St Leonards Model Supplies is the 'Excalibur', designed by T. R. Mason and very similar in appearance to the APS 'Orcrest'. Wood appeared to be of good quality and all hardware is supplied, including a tank-Kit. Even the gussets are die cut - a nice feature - but perhaps a little unfortunate is the two-piece leading edge. Price £4.20.



fly really well (i.e. 'groove' well with good line tension) could be produced and many more beginners would survive the first hurdle. After all, the beginner may today only be buying a very simple little model, but in a year or two, if not so discouraged by the poorness of his 'basic trainer' that he (or she) gives up. The beginner becomes an aeromodeller and will be spending a lot more money.

General Kits Whilst there are some good British combat model kits and also a few good American stunt model kits available, most of the general sports kits marketed are old-fashioned to say the least. The situation may be changing since this year has seen more new kits announced for control-liners than for many years. Unfortunately, few of these new kits look much different from the old ones - still multi-rib spar type, delicate structures etc. In my opinion, the majority of the kits available are 10-20 years old in design concept if not in actual design. Surely the continued marketing of 'vintage' models does not serve us well? Times have changed, there have been design and constructional developments. Is it not time the 'Trade' recognised this? Much better flying and more easily built models could and should be kitted.

Motors It breaks my heart that I use motors from all over the world except my own country. What on earth happened to the British motor industry that it stopped designing new motors years and years ago? When designs (and therefore performances) became obsolete, can we users do anything other than look elsewhere? The market still exists, so what happened? Besides this strange domestic motor situation, the imported motors supply situation is almost as peculiar. Why are Super Tigre motors and spares so spasmodically available? Why have MVVS's been sold by some

Another offering from St Leonards - an 18in. span profile scale Spitfire, designed for 0.5cc engines. With all sheet construction, this should prove a robust trainer. Again a fuel tank kit is supplied, together with bellcrank, and nylon elevator horn. Price is £2.95.



Latest prop balancer available is tapered to accommodate virtually all propeller sizes – just place prop in position and hold the pointed ends of balance lightly between thumb and forefinger to find the 'heavy' blade. Produced by Maple Models, this item retails at 65p.

retailers, with no spares back-up at all? Why did Rossi diesels appear on the Continent and in Scandinavia a long time before they were available here? Something is wrong somewhere because as the Nats show year after year, we have one of the biggest populations of control-line modellers in the world.

Accessories A really bad area this for when we look at basics – lines – little is offered. In these metric days, can we buy metric lines? No is the answer (through the 'Trade' anyway). Can we buy line reels and line connectors? After the beginner has bought his lines ingeniously bubble-packed on cardboard, and has unpackaged them without ending up with a tangled mess, just how does he make-up the ends, connect them to his model and handle and then reel them in on the typical wet field? Any comments? Tanks, my favourite subject at the moment. Have you noticed that advertisement for 'Pressure Fed' tanks? Who is that 'top control-line modeller who knows what team racers need'. I alternatively fall off my chair laughing and then get angry thinking someone may actually believe what the ad. says. Props, better, but a lot of the nylon props available at the moment seem carelessly moulded, i.e. bubbles at the root. Personally I have given up hope of finding one of the much advertised 8 x 8in. Topflite woods for my 'B' Team Racers; it took many months for an IP 7 x 4½in. and a Graupner 7 x 5in. to be located; now I am told that Taipan 7 x 6's are like gold. Of course wood, tissue, Solarfilm, glue etc. are widely available. If you are selective, good wood is available, although a lot of wood seems like the curate's egg – good in parts! But there is more to modelling than wood and glue.

I feel this article has shown, simply by quoting a few examples, that we control-line modellers are not well served in general by the Model Trade. There are always the exceptions that prove the rule and my opinion is that the people who do try hard to serve us well – such people as Ron Irvine, Henry J. Nicholls and many others – are the exceptions. If poor products apparently can be sold in economic numbers, surely the expanded market available to good products makes more economic sense. Like the Guinness advert says, 'you are the seventh person I have told today that there is no demand'. I am convinced that the market does exist sufficient to make we control-liners deserving of a lot more consideration.

It goes without saying that this article represents my personal views and does not necessarily imply the agreement of the publishers. If I am mistaken in what I have written, then I apologise and will correct any such mistakes at the earliest opportunity.

THE 1975 'HORTY' CHARTS

It gives me great pleasure to report once again on John Horton's magnificent Racing Lists. This year, John has tabulated all of the results he has received for FAI and B Team Race as well as for Goodyear, and has produced an overall summary of the year's racing Nationwide. A great task performed voluntarily and unprompted; John deserves all of our thanks.

As a reminder of how John's system works, points are awarded as follows:

Experts		Novices	
1st	6	1st	3
2nd	5	2nd	2
3rd	4	3rd	1

Novices are teams who have accumulated less than 10 points. Novice points in Goodyear are awarded only when a separate 'Novice Final' is run at a contest. John awards points and keeps the records on the basis of all results received showing no discrimination as to the location and/or quality of the contest. If you want your contest to be included by John, just write to him with the results, his address is 10 Lawn Avenue, Burley-in-Wharfedale, Ilkley, West Yorkshire LS29 7ET.

Down to the nitty-gritty. First the FAI List with 18 events tabulated, and 19 teams receiving points.

		1st's	2nd's	3rd's	Points Total	
1.	Heaton/Ross	Norwest	6	1	1	45
2.	Rudd/King	Feltham	3	2	3	40
3.	Clarkson/Daly	Norwest	3	1	3	38
4.	Horton/Haworth	Wharfedale	2	2	3	34
5.	Smith/Fry	Feltham	2	3	0	30

Showing Heaton/Ross the biggest winners by a large margin (well, what did you expect!)

Now to the B List, where 9 events were recorded and 17 teams received points.

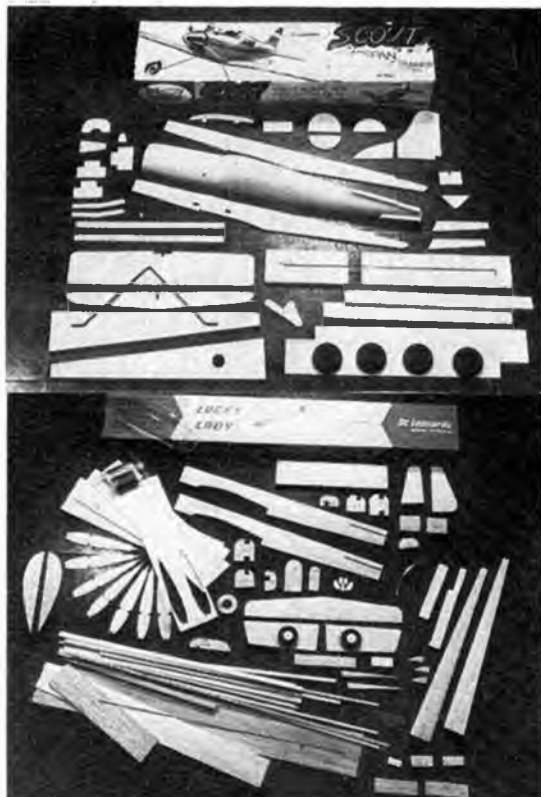


		1st's	2nd's	3rd's	Total	
1.	Ridley/Burns	Nuneaton	2	1	1	21
2.	Smith/Hudson	Tynemouth	1	3	0	21
3.	Clarkson/Daly	Norwest	2	0	0	14
4.	Fitzgerald/Pickles/McAlroy	Wharfedale	0	2	0	11
5.	Everitt/Cooke	Norwest	1	0	1	10

Definitely a Northern speciality so it seems, with 'B' specialists coming out on top. Unlike for FAI, John has recorded the 1972-to-date annual points totals to come up with the 'ALL-TIME "B" GREATS'.

	1972	1973	1974	1975	Total	
1.	Horton/Haworth	13½	10	19	0	42½
2.	Heaton/Ross	10	17	4	8	39
3.	Everitt/Cooke	6	4	9	10	29

Yet another pair of new C/L models. Below is the Cambria 'Scout' – a 21in. span trainer for 0.75-lcc motors – novel in featuring a moulded plastic top decking. Employs sheet construction, with all parts die cut. Distributed by Ripmax, it retails at £3.95. At bottom is another St Leonards kit – 'Lucky Lady'. A sports design of 32in. span, using 1.5-2.5cc engines, it features traditional construction and has all parts die cut. Retailing at £5.70, it also has a smaller sister – 'Little Lady' for 1-1.5cc engine, which costs £4.50.





Pylon Brand C/L accessories are now available from Irvine Engines. This is a 'leadout kit', consisting of heavy duty multi strand lead-out wires, brass eyelets for forming the loops plus copper tubing and a crimping tool to secure same. Two sizes are available price 35p.

Finally, the big one – the Goodyear List of 19 events with 39 points-scoring teams.

		1st's	2nd's	3rd's	Points Total
1. Fry/Smith	Feltham	4	3	1	46
2. Horton/Haworth	Wharfedale	4	2	2	44
3. Daly/Howard	Norwest	2	2	3	34
4. Clarkson/Daly	Norwest	4	1	0	30
5. McMahon/Myszka	Wolves	3	2	1	30

A real mix-up of motors used with Rossi glows 1st and 3rd and various diesels completing this top 5. All of these used different model designs too!

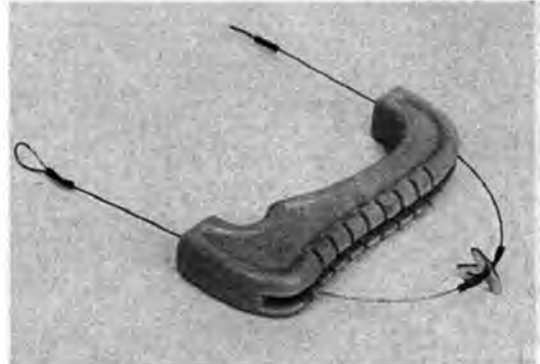
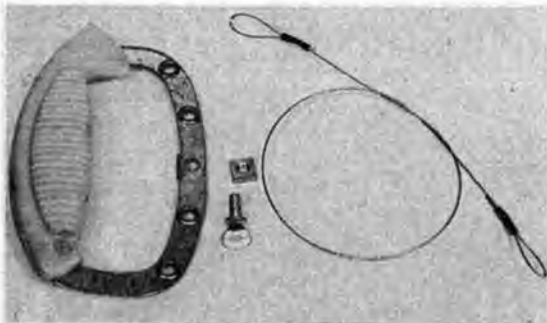
The 'Elliot Novice Trophy' awarded to the highest placed team starting 1975 as Novices, goes to McMahon/Myszka who just headed fellow Wolves club-members Allcock/Chambers for the Trophy. My own 'Novice of the Year' title (i.e. the highest place team starting 1975 with no points at all) goes to Hutchinson/Leigh of Norwest who gained their 12 points by winning four Novice Finals on the trot. Congratulations to all of these Novices, it has been quite a year hasn't it! Whilst on the subject of the Novices, I should point out that of the 39 teams receiving points this year, no less than 27 started the year as Novices. This tells me that Goodyear is in a very healthy state indeed.

The last Goodyear fact is the listing of the 'ALL-TIME GOOD-YEAR GREATS'.

	1970	1971	1972	1973	1974	1975	Total
1. Clarkson/Daly	0	26	31½	26	40	30	153½
2. Horton/Haworth	11	17	20	15	23	44	130
3. Fry/Smith	8½	3	9	28	34	46	128½

So we come at last to the Overall Team and Club List. The first time John has ever done this, a massive task since it involved the results from more than 60 events in ½A, FAI, B Goodyear and Rat – all of the Racing classes. It should be remembered that the placings are not 'official' i.e. are not the SMAE Champions. The SMAE totals its placings on a much reduced number of events and in any case there is no SMAE Club Championship.

Pylon Brand Adjustable Handle has metal core with moulded nylon hand piece. The connection cable, which is heavy duty, multi-strand, is then routed through one of the 'eyes', past the wing slot and out through another eye in one continuous piece – thus line length is adjusted by clamping the line in the appropriate place. Price 75p.



The Pylon Brand 'Pro-Handle' is moulded in bright yellow nylon and has a novel form of line length adjustment – a 'T' shaped spade fits into any one of a number of slots on the rear of the handle to accomplish this, as can be seen above. Price 90p.

		½A	FAI	Good-year	B	Rat	Total
1. Clarkson/Daly	Norwest	0	38	30	14	0	82
2. Fry/Smith	Feltham	0	30	46	2	2	80
3. Horton/Haworth	Wharfedale	0	34	44	0	0	78
4. Heaton/Ross	Norwest	15	45	5	8	0	73
5. Rudd/King	Feltham	6	40	12½	0	5	63½

Pity I cannot blow my own trumpet (don't have one) but your scribe does feel just a mite proud! Especially as a result of the

Overall Club Championship.

	Total Points	No. of Teams	Av. Pts./Team
1. Norwest	243	6	40.50
2. Feltham	241	8	30.15
3. Wharfedale	142	4	35.50

Yes, 'NORWEST IS BEST'. 'Mighty Feltham Rules?' more like 'Mighty Feltham Fools'. And the 'red rose' has seen off the 'white rose'. (Just thought I would throw in a couple of insults to warm things up for 1976.)

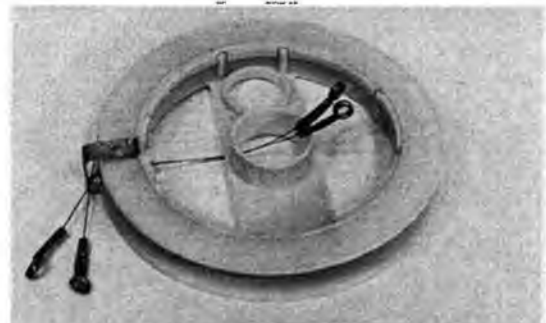
One observation on the Club Championship is that the Netherlands, France and Sweden finished in front of Scotland whilst obviously having much less opportunity to gain points. Is C/L racing dead in Scotland? Wales and N. Ireland (and Eire) didn't even get a point; are there any C/L racing teams at all there?

UNDERCARRIAGE DRAG

It is becoming fashionable for racing men to use streamlined or retracting undercarriages on their models. Is this just a fashion or are there real benefits to be gained in terms of extra airspeed? Calculations for a typical team racer performed by Enrico Flores (pitman half of winning team at Utrecht) confirmed by wind-tunnel tests performed by Louis Peterson in Denmark give the following approximate drag distribution:

Lines	55%
Wing	12%
Fuselage	21%
Tail	4%
Undercarriage	8%

Pylon Brand's most famous accessory – superb quality 7 strand stainless steel lines, supplied on a plastic spool, and with both ends fitted with eyelets. Very kink resistant, in normal use a set should give years of service. Various lengths and thicknesses are available but do not be put off by the '7 strand' tag – the 52 foot set of lines measure just .015in. dia. Prices range from 98p to £2.78.

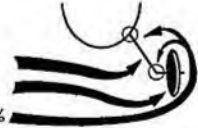


By retracting the undercarriage, a drag saving of 8% is achieved which means a speed increase of about 3% i.e. a typical saving of 0.7 sec/10 laps in airspeed.

Fully retracting undercarriages are extremely difficult to engineer successfully – it is mind-bending enough to work out how to make one, never mind actually making one. Therefore many teams are looking at streamlined, fixed undercarriages as an alternative – the notable users of these latter items for years have been the Russians; recently these have been joined by such notables as the Metkemeyer brothers, Heaton/Ross, Fontana/Amodio, Larsson/Rylin etc., quite a lot!

To gain some understanding of this problem, I obtained a copy of NACA Report 485 which gave some really key experimental results. Firstly, the drag of a single strut type undercarriage (our sort) is distributed like so:

LEG 15%
WHEEL 70%
INTERFERENCE 15%



Secondly, fairing the wheel reduces the wheel drag by about 40%. (See Figure 1) while thirdly, the angle of the leg to the wheel has a big influence over the interference drag – Figure 2.

Finally, removing interference between the leg and the wheel and fairing the wheel has a big effect as shown in Figure 3.

Typical of the in-line leg and faired wheel type shown above was that used by Larsson/Rylin at Verviers. The conclusion is that by doing this, they achieved a drag saving on the model plus lines of about 3.5% which was worth an airspeed improvement of around 0.3 sec/10 laps.

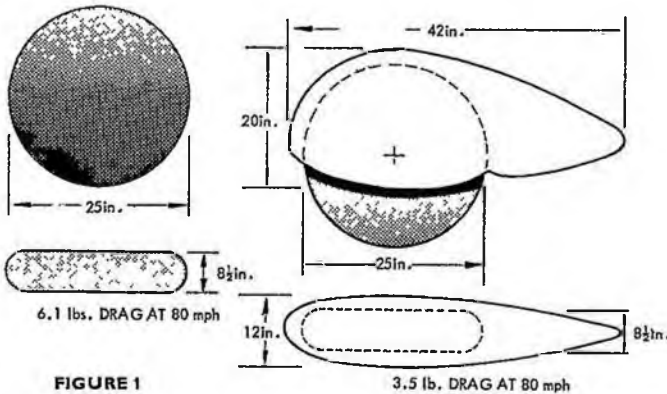


FIGURE 1

Summarising, a fully-retracting undercarriage is worth about 0.7 sec/10 laps in airspeed whilst a fully streamlined, fixed undercarriage gives up to 0.3 sec/10 laps improvement. Hardly important for our ordinary mortals who are 2 or 3 sec/10 laps slower than the world's best, but at Verviers that 0.3 sec/10 laps would have moved John and I up five places in the results. Every little helps is my motto!

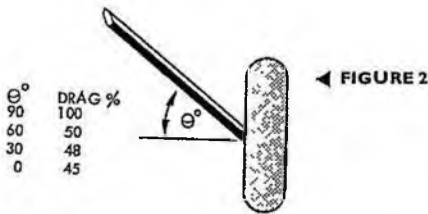


FIGURE 2

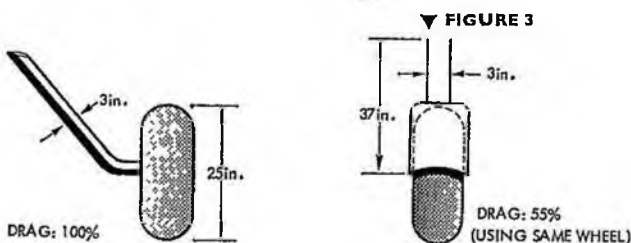


FIGURE 3



Two carbon fibre team race props from the moulds of Jim McCann. The elliptical bladed design is the 7 x 8in, while the straight-tapered design is the 7 x 7 1/2in, which has been performing so well recently. This has a conical formed hub to blend in with the prop nut and the front of the fuselage. Both are superbly moulded and supplied free of any flashing, and retail at a remarkably low £1.50 each (these are carbon fibre props, remember).

GOODIES DIRECTORY

Schippers T/R Equipment

Now available from Paul Schippers of Postbus 1355, 's – Hertogenbosch, Holland, are *Turtle IV* and *1/2 A Turtle* parts such as pans, canopies, bellcranks, wheels, pilots, tank valves, GF fuselages etc., as marketed by Henry Helmich. Paul Schippers in fact produced many of these parts for Henry, and has now gone into the business on his own behalf.

Besides these well-known *Turtle* parts, Paul is also manufacturing and selling the following specialist T/R parts.

- Finger valves (with 'O' rings), very fast filling.
- Cox type needle valve assembly with 6mm internal diameter.
- Venturis threaded M6 x 0.75 to fit Cox type needle valve assembly (state venturi internal diameter required).
- Nylon backplate adaptor to take venturis, state motor to be fitted.
- Pressure re-fueller kit including finger valve and fuel resistant rubber bulb.
- Lightweight Russian type motor valve including needle valve, state motor to be fitted.
- Drum valve for RV motors, Russian type motor valve fits, state motor to be fitted.
- Two-part contra piston plus head, state motor to be fitted.
- Krasnorutsky style pans (in preparation).

Now that Alan Cooper has gone out of this highly specialised business, the arrival in his own right of Paul Schippers on the scene is most timely. Write to Paul for further details and prices, not forgetting an International Reply Coupon. Paul is also prepared to perform custom machining work, however honing and heat-treatment type operations are beyond his current capability.

In his quiet way Paul has been at the centre of the Dutch 'Goodies' development programme for some years now. I wish him well.

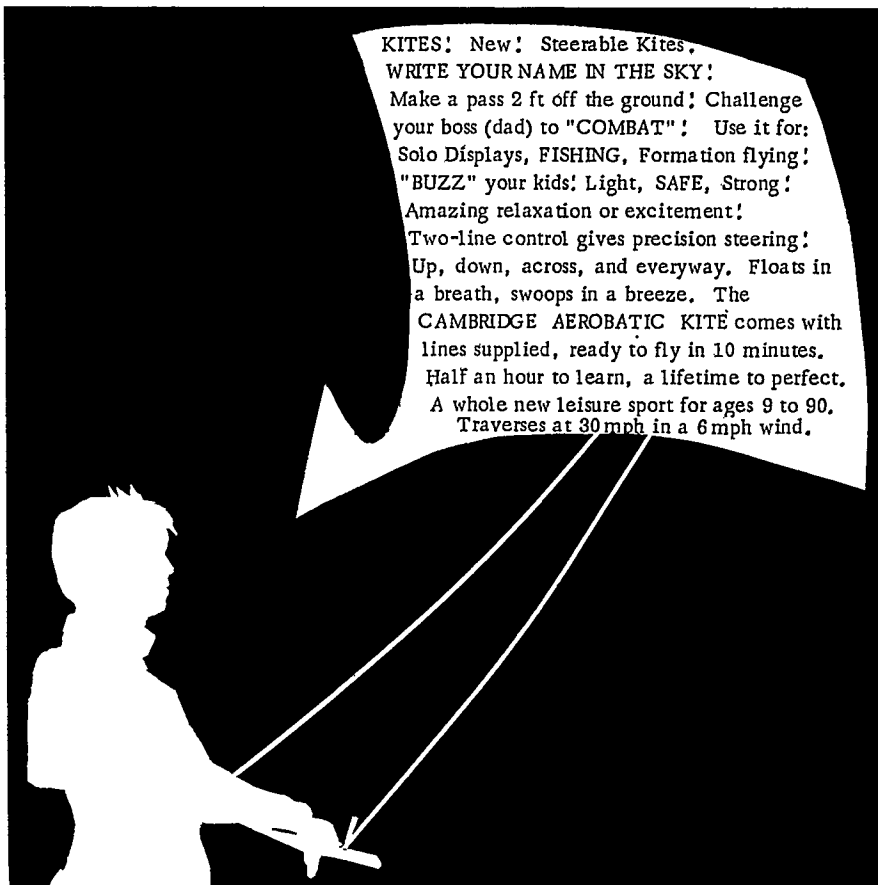
McCann T/R Props

Jim McCann, already well known for his Rossi T/R prop made specifically for Fratelli Rossi, has now gone into the team race prop market on his own account and now produces two props for direct sale at £1.50 each. These props are:

- McCann 7 x 8in. from a master made by Jim.
- McCann 7 x 7 1/2in. from an originally Russian master.

The latter prop is an all carbon fibre prop. Made to Jim's very high standards and usable with little or no reworking, these props are supplied without any flash and with consistent pitch and thickness blades. The McCann all-carbon 7 x 7 1/2in. has already an enviable reputation having been used by Heaton/Ross for their recent no-groupers heat and final records of 4:10 and 8:39 respectively. As an illustration of the as-received quality of this prop, the Heaton/Ross 8:39 record was achieved with a totally standard prop – not re-worked or even balanced – used in fact straight as received from Jim. Order McCann props from J. McCann, 'Rydal Mount', Widdrington Road, Blaydon-on-Tyne, Tyne & Wear, NE21 4DA, and allow reasonable postage and packing cost in your payment.

Cambridge Stunter Kites



**KITES! New! Steerable Kites,
WRITE YOUR NAME IN THE SKY!**
Make a pass 2 ft off the ground! Challenge
your boss (dad) to "COMBAT"! Use it for:
Solo Displays, FISHING, Formation flying!
"BUZZ" your kids! Light, SAFE, Strong!
Amazing relaxation or excitement!
Two-line control gives precision steering!
Up, down, across, and everywhere. Floats in
a breath, swoops in a breeze. The
CAMBRIDGE AEROBATIC KITE comes with
lines supplied, ready to fly in 10 minutes.
Half an hour to learn, a lifetime to perfect.
A whole new leisure sport for ages 9 to 90.
Traverses at 30 mph in a 6 mph wind.

Standard
30" wingspan
£2.95 inc p&p

Giant
43" wingspan
£3.95 inc p&p

They are the ones for **REAL CONTROL!**

THEY ARE ALSO SAFER AND TOUGHER



200 gauge polythene sail, light but strong enough to fly in a gale.

Flexible plastic nosepiece for safety.

Total weight of kite less than 4 oz.

Individually balanced bamboo wing spars for strength and lightness.

Reinforced front end with 500 gauge plastic to resist thistles and stones.

Steering bar so you can fly it with one hand, or fly two kites.

Unique tail for precision control gives the sharpest turning circle and most exact aerobatics of any steerable kite we know. (Patent applied for) Steer square 888s, clover leaves, triangles.

Low-stretch linen lines to prevent that soggy feeling, and provide perfect feel.

SPECIAL OFFER TO READERS OF AEROMODELLER

30p off each kite ordered before 1 April

NO RISK TO YOU

No questions money back guarantee.

If the kite is returned to us in mint condition,

we will refund your money without quibble.

If you have damaged any part we will still refund almost all your cash.



REMEMBER—EASTER TIME IS GOOD KITE FLYING TIME

Just fill in the coupon and send it with the correct money to:

CAMBRIDGE LEISURE, Dept AM,
Rivermill House, St. Ives, Huntingdon, Cambs, PE17 4BR.

Please supply——Standard kites at £2.95 for one
£2.65 each for two or more

Please supply——Giant kites at £3.95 for one
£3.50 each for two or more

Name.....

Address.....

I enclose cheque/P.O. for.....payable to Cambridge Leisure

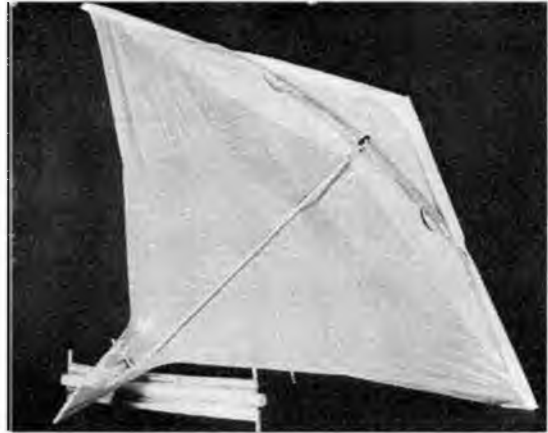
KINDLY MENTION 'AEROMODELLER' WHEN REPLYING TO ADVERTISEMENTS

Latest in controlled **KITES**

Aerobatic 2-line design
by Cambridge Scientific

RESURGENCE OF INTEREST in the kite has brought forth a relatively new approach which adds enormously to the pleasures one can derive from these simple flying machines. This is the application of 2-line control so that the kite becomes fully manoeuvrable. The idea is not new. Paul Garber used earlier life saving suggestions when he produced the US Navy target kite in the mid forties. This large kite, made in thousands, was controlled with a ventral rudder, tensioned by two widely spaced cables that also applied varying bridle trim. Then the famous North Pacific Co's *Glite* appeared with 2 line pick-up points, marked on its Rogallo rigid leading edges and as seen at the '75 Nats, this can offer lots of fun.

Topside (right) shows Malay shape with tensioned bow lateral spars. Two lines are provided on control bar.

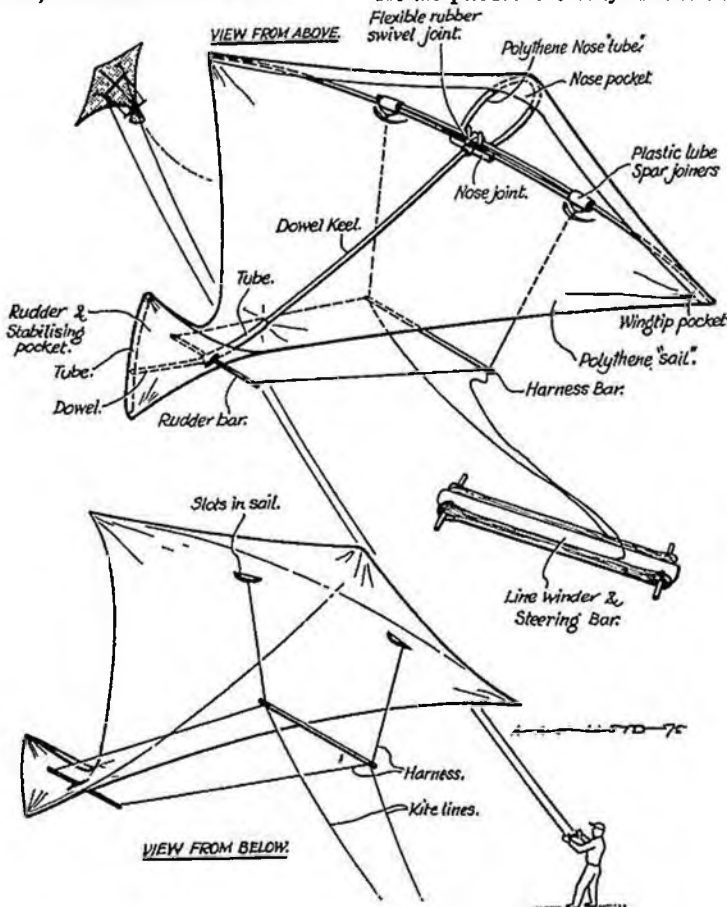


Refinements came with S/Ldr. Donald Dunford's *Control line kite* (Pat 134004), which encompassed aerodynamic features with its cambered canopy, Conyne centre slot, Vee box fins and amazing stability. As Don has shown on TV and at our Old Warden kite rally, he can pick up a handkerchief, prick a balloon, or even remove a spectator's hat with his exceptional sensitivity of control.

More recently, Peter Powell's *Stunter* appeared as a developed Rogallo with excellent control and the added feature of its long tubular tail, which traces a flight path and makes formation flying a joy to see. Each of these kites has been sold through larger toy shops, a few model shops and mail order.

Now a new one appears from Cambridge called the *Cambridge Scientific*, and using a combination of features to achieve very sensitive control.

It has a harness bar, linked to a rudder bar and the rudder is a vertical drogue air trap at the rear of what might well be described as a Malay bow. Assembly cleverly adapts the tradition of the Far Eastern Kite with modern use of plastic tubing and polythene sheet covering. It goes together quickly, is smaller than its contemporaries (43in. across tips) and flies just like a Hong Kong or Singapore line cutter. In other words, it twitches and turns like a frenetic midge. Anyone who has longed to capture the techniques of controlling the Malay Kite but found it as bewildering as we have, will be thankful for this Cambridge device. Its rudder effect and harness bar tension allows all forms of aerobatics. Being light, it will fly in soft breezes (10 mph recommended) and lends itself to combat with tissue streamers. The plastic 'nose' takes a full bore dive into hard ground with impunity, but watch before quickly re-launching, that the fuselage spar has not slipped on impact. This one piece of dowel holds the whole shape, and sets up the rudder drogue, so beware! At £2.95 it's worthy of a place in the car for whenever it seems too windy to test the new model. Two (for combat) come for £5.30.



The *Cambridge Scientific Kite* is available from Cambridge Leisure of River Mill House, St Ives, Huntingdon.

topical twists

by 'Pylonius'

illustrated
by Sherry



"Can you tell me which one is the vintage event?"

Patch Work

GENERALLY, in the hierarchy of things, the model plane comes well down the list – if, that is, it is on the list of socially acceptable activities at all – and takes very much a back seat in the sporting leagues, coming some distance behind open air tiddly winks.

Many people – including most who sit on local councils – regard the model plane as a particularly nasty form of pollution which must be tackled in a vigorous, public spirited way. Of course, councillors are generally biased by the fact that they live in the more salubrious part of their precinct – around that very open space which the anti social model infests.

It is true that model aircraft are allowed on certain airfields – but it is only on sufferance. If the airfield is required for any other purpose, like karting or five-a-side football, then up goes the 'No Entry' sign in large letters.

Harried and driven on all sides, it is little wonder that the model flyer seeks refuge in his very own little patch, where he can fly to his heart's content without going on his knees every five minutes to some formidable authority or other. All the best model clubs are already so deeply embedded in the countryside that many a town born child has never seen a model plane fly, much as in former years he had never seen a tree. There is a snag about these rural hideaways, however: they are mostly rented from farmers, and tenure can be uncertain. Let the suspicion occur that engine noise is curdling the milk, and out goes the order of the boot. What is looked for is absolute land ownership, and we see that the American equivalent of our SMAE, the A of MA, have just purchased a plot, twixt oil field and cattle range, deep in the heart of Texas. We, in Britain, haven't anything deep in the heart on offer, but who knows but an abandoned oil rig may not come our way.

The fact of our flying fields being few, far from the beaten track, and full up anyway, has a marked bearing on what the newcomer to the hobby is building. He opts not for the possible but the impossible: the multi engined, multi radio monster. He knows he won't have anywhere to fly the model anyway, so it would be most frustrating to build something that was a flyable proposition if it could never get airborne. Much better to embark on something quite unrealisable which, in all probability, will never be completed. Good for the hobby (every extra flying model is a threat), good for the environment, and exceedingly good for the Trade.

Steam Rodeo

When you read of a control line vintage event being staged it makes you feel really old. Why, it only seems yesterday that I became aware that a bellcrank wasn't something that

hunchback bloke swung upon, and learned to my amazement that u-reely control your model with the new wonder handle. Leg wearing, eye straining, model losing free flight was happily a thing of the past. As long as pivotal rotation did not give you a severe attack of the collywobbles, life would be one happy roundabout – a fully aerobatic paradise. And it was a lucky day for the spectators, too. Necks could be worn at a normal angle, and eyes left to rest quietly in their sockets, as the captive models did their realistic tricks in comfortable visual range. Quite what went wrong with this paradisaical order of things I am not quite sure – perhaps it was a little thing called Radio.

Split personalities

An article in our companion journal, *Radio Models*, deplores the way clubs are split by dissentians within, and suggests a few useful ploys by which to deal with such disruptive elements.

From this some people may have got the idea that political infighting is something new in club life; so let me assure them that it has a long and not all that honourable tradition. I don't know what they got up to when model planes were made of birds feathers and catgut, but circa the bamboo and oiled silk era the term 'solid modeller' had a different connotation to the cerebral significance of today. Anyway, this chap who reverently carved his replica models from billets of pinewood (Whittle Jets?) regarded the whole business of chucking models about over the local park as vulgar and socially demeaning, particularly those with full frontal gears. Later on clubs were to break up on the tensions between the functionalists and the realists – those who just built and flew small flying machines and those who deferentially turned out miniature copies of full size aircraft. As the evolutionary pace increased so were there showdowns between the control liners and the free fighters, with the new fangled Radio faction weighing in for good measure. Clubs did not so much split up as fragment into their component parts. Often, though, there was a straight battle between the flyers and the non-flyers, with the non-flyers accusing the flyers of getting all the benefits, such as competitions, trophies and airfield amenities. The flyers, in their turn, would go into a huff, thinking it pretty useless staying in a non-flying model flying club, and so in the Fifties we had a defiant flourish of clubs with the word *Outlaws* or *Rebels* featuring largely in their titles.

And so it goes on. Just now its the non-Radio man, whose wants are simple and undemanding, in opposition to the grandiosities of the affluent Radio man, with his expensive tastes in pasture tonsorials and bibulous barbeques.

THOSE EARLY DAYS

re-called by 'Magpie'

YOU NEVER REALLY recapture the thrill of that first solo, and the same applies to that first flight of the very first model you ever built. Life, however strange its course, does have its moments and these undoubtedly belong to them. There will be many more in our aeromodelling career, but none will quite reach the level of awe and wonder that such things can bring. True, the first tests of a new design, particularly when it is somewhat unorthodox, has its element of tension and surprise, but you know more or less what to expect, be it good or bad and if you have been hardened against setbacks then you are learning all the way.

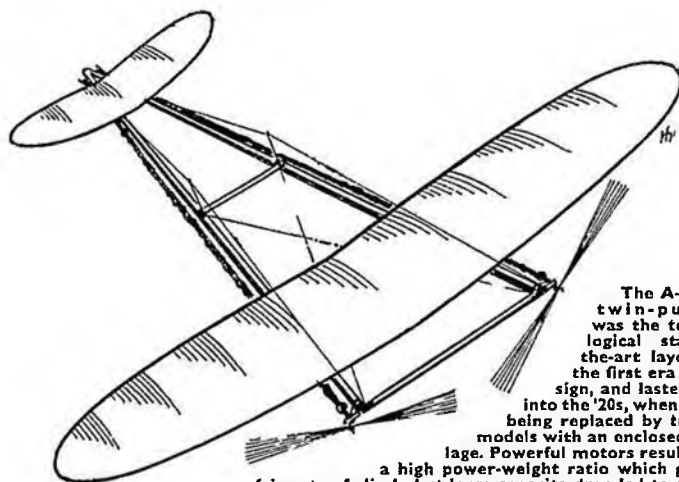
Some of these thoughts chased around my head when I happened to find some photographs of the distant past of aeromodelling. Events became suddenly clear that I thought had disappeared in the fog. *History is bunk*, the great Henry Ford is supposed to have said. Maybe it is the way it is taught at school, but if one studies history with the idea of avoiding the mistakes of the past — which perhaps is a pious hope — then it would serve some purpose. So bear with me for a while as I compare the things that were, with those that are today, with the object of hitting on a worthwhile lesson or two.

It will probably, by now, be clear that my first hesitant steps on the fateful road were set in the days of stick-and-string models, like A-frame twin-pushers and suchlike creations

carrying aloft their own built-in headwind. If I should have the impudence to say that 'those were the days', readers will soon pigeonhole me as one of those old fogies who can only admire the past and are against

those old days *were* different, and had their own strange charm.

An important factor was the simplicity of aeromodelling materials and the amount of work that had to be done with what was available



The A-frame twin-pusher was the technological state-of-the-art layout of the first era of design, and lasted well into the '20s, when it was being replaced by tractor models with an enclosed fuselage. Powerful motors resulted in a high power-weight ratio which gave a fair rate of climb, but large parasite drag led to a poor glide. Counter-rotating propellers cancelled out torque which facilitated adjustment. Props being situated well behind the CG served the double purpose of providing side-area, eliminating the need for a fin. An admirable, functional, layout at a time when thermal soaring was unknown.

all modern development. Therefore I might as well add that I am still in the designing and building game, along rather modern lines, and my interest in airflow and airfoil theory is as keen as ever. But it is a fact that

before one could even begin building. Wings were generally just outlines with very few ribs, and covered with 'oiled silk' sewn around the contour. You often made a wing of piano wire with soldered joints, which had the advantage that dihedral could be changed on the spot. Piano wire came in coils and one had to be adept at straightening it, for if you didn't, the whole thing jumped out of its jig like an overgrown propeller. Another form consisted of a bamboo leading and trailing edge with piano wire tips and ribs, bound and glued on. The bamboo had to be split, and split again, and given the proper section by scraping it with a piece of broken glass. It could be bent by holding it over a gas flame, so many a wing carried the marks of scorching. Models did not have a fuselage but a mere hollow spar, carrying kingposts for the wires which had to brace it against the bending and torsion of the extremely powerful rubber motors which just dangled below it, and when unwound collected all the sand and



The late Stan Rushbrooke, for many years Editor of this magazine, at the 1938 Wakefield Cup with a Canadian model which he flew by proxy.



The American team at the 1938 Wakefield Cup meeting, held at Guyancourt, France. On the extreme right is Jim Cahill, the eventual winner (plans for his 'Clodhopper' design are available as order no. D1188X, price £1.00), while in the centre is Chester Lanzio with typical Korda style, slab-sided fuselage model.

dirt they could find. Eggbeaters were converted to winders, and the winding was done at the end opposite to where the propeller lived. Propellers were made of thin sheets of plane-wood, scraped by glass to the required thickness and the 'twist' was steamed in over a kettle. They were made quickly and were probably not very efficient, but there was power in plenty. Fish or bone glue came in tins and had to be kept fluid by standing in hot water. It was used only for strengthening the joints which were bound by carpet yarn and took a long time to dry. Finish was mostly a coat of shellac over the wooden bits and the stitching of the 'oiled silk' over wing and empennage.

If you had a nice collection of wings, tail surfaces and props, motor sticks and landing gears hanging on the wall of your workshop, it was a matter of mere hours to assemble a 'new design' and nobody knew or cared about wing loading or aspect ratio, while the power-weight ratio

A youthful Bob Gosling with his A-frame pusher which apparently features no less than three wings, one behind another.



was chosen as high as the model would stand, both structurally and aerodynamically. The initial burst of power caused beautiful wing flutter and the bursting of one motor on a twin pusher led to evolutions which must have been seen to be really enjoyed.

Twin pushers were the *ab-initio* models and supposed to be the easiest to fly; having the props running in opposite directions there was no torque problem; and the term down-thrust had not been invented. A single engined 'tractor' was regarded as the type for the 'expert' only, and when it took off from the ground one gained bonus points.

Again, I won't say "those were the days", but they certainly were good days. Many were to follow later. Maybe one of the things was that aeromodellers were still thin on the ground and a strange new face was an event. The public came to watch – as it does now – but regarded the whole thing as a toy that kept the boys from the streets, quite ignoring the fact that the boys were students or men in quite responsible positions in full size aviation. That is one thing that has not changed much with time.

So much for the Stone Age of aeromodelling. Models became more like what they look like now, but the game was still very different in some ways.

Bonus points were given to models which had the rubber 'enclosed within the body', which was obviously regarded as doing things the hard way and causing an increase in weight and drag. In a way that was true enough. When Sir Charles Wakefield (of Castrol Oil fame) presented a Cup for international competition – with the object of bringing together aeromodellers of different nations – a Select Committee was charged with drawing up the contest rules. The first Wakefield Rules specified a minimum weight of half a pound and that still is the case, strange as it may seem. Rubber weight was not limited, nor size of the model, so wing-loading was free. It was not until a contest was

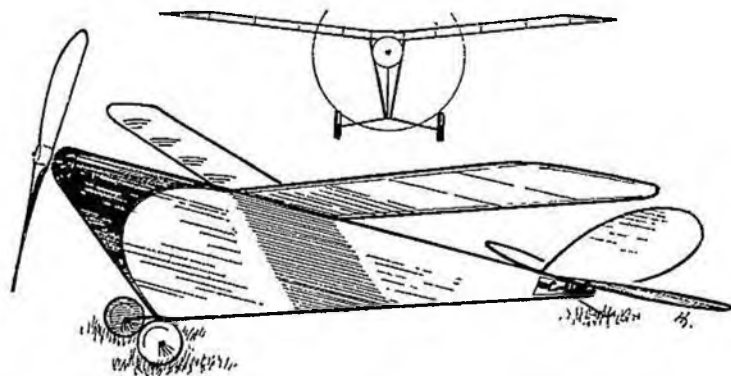
won by a model that just floated around at low level during a windless day that a limitation was placed on area, and then wing loading came in. Models still had rubber motors of diabolical power and the great snag was to control torque at the take-off and keep the model from rolling over onto its back.

ROG was, of course, compulsory since we talked of model aeroplanes and all proper aeroplanes ran along the ground to obtain flying speed, with the exception of naval aircraft shot off with a catapult. One had to resist the horrible temptation to help the heavy model along with a push, however gentle, for that meant instant disqualification. Try to hold a model on a take-off board by just the tip of the propeller and wingtip, preferably with the model pointed at an angle to the strong wind to compensate for the torque, and you will realise that it was a man's job.

The committee were a conscientious lot and soon came up to the dreaded job of deciding what could be regarded as a fuselage, for a slender case just enclosing the rubber motor was clearly out of the question, aeroplanes in those days were well fed so it was felt that this should also go for models. This resulted in an extraordinary 'fuselage formula' which gave the minimum cross sectional area at the model's ambon-point as the square of the total length divided by one hundred. Compared to today's models, the Wakefields of the late twenties and early thirties were veritable pantechicons and if a builder was unwise enough to have a propshaft or rear winder project beyond the fuselage further than strictly necessary, he would have to add a bit to the girth of the model. Those were not the days for swept-back fins. Later the factor below the dividing line was increased to 120, but models were still well endowed. Gliders were more svelte with a factor of 200, and since no rule said where this maximum cross section was to be located, some extraordinary designs appeared, like Ossie Czepa's *Toothpick*, which had a short fat nacelle at the end of a stick connected with wings and tail surfaces. But all that was very much later.

The spirit of the thing may be more important than the technique. All the same many have regretted the complete scrapping of any rule regarding a fuselage, not because they were

One of the fuselage models of the later twenties, when ROG was a must. Plater used this type of layout and may have been the originator. Cross-section of the fuselage was a very deep, narrow triangle, carrying a simple landing gear at the lowest point. Wing loads were carried by stout leading and trailing edges joined by 3-ply ribs. Steel wire tips, silk covering, doped. Empennage of steel wire outlines torsional loads on fuselage. Simple, functional and good-looking as well.



hopeless diehards, but because it meant the loss of a design problem. To design a light fuselage of the longeron-and-strut variety in which tension and compression played their rough game with the torque of 3 ounces of fully wound rubber motor was a task which certainly divided the men from the boys. Winding such a fully stretched motor to the upper limit of safe turns may have been conducive to ulcers, but since these were not a fashionable complaint in those days, very few people went in for them. Still there once was a Wakefield flyer who requested a noggin of brandy after his dicey first take-off, but luckily for the organisers that this did not set a fashion.

The ROG take-off was also axed out of existence. This is a rather curious story and FAI delegates may demand my scalp for this – which would hardly be worthwhile – but I am only giving my view, and who cares anyway? With the handlaunch of Wakefield and Power we were really back to square one and lost another interesting design task. To make a model with relatively vast power – sometimes as much as one third of the total weight – take off from a board of no more than twenty feet long, right side up and pointing to the sky, was no mean feat. There was not only a burst of thrust, but torque as well and if you played about too roughly with the gyroscopic moment you had a tiger on your hands. It may have led to suicidal tendencies on the part of the models. Even so there were beautiful controlled take-offs by designers like Ralph Bullock, Chasteneuf and Jim Cahill. It is a pity that Bullock's models never got into one of Frank Zaic's famous *Yearbooks*, but the other two did. Ralph was the finest designer in the world, bar none. Now why did the ROG rule lose favour? ROG should be with the model resting on three points in contact with the ground, and that could be with two wheels and some tailskid or one wheel and two skids. You could not do it with Wakefields, but the power boys found that, provided you have

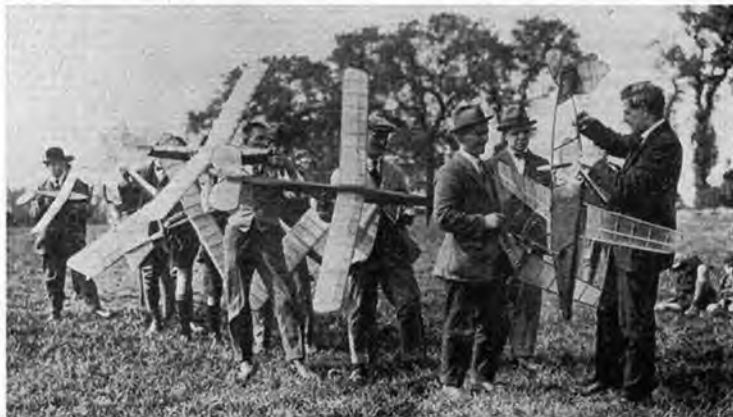
three fixed points at the tail, you could put your model on the ground with the nose pointing straight up and there was enough power reserve to make the model rise. There was that dicey stage with the model barely climbing, and when it tended to go over on its back, you had it. Well, that was all right according to the rulebook and there was no need for that cumbersome take-off board, many of which were needed for a World's Championship and always a cause of complaint from those who insisted that it was just that foot or so too short. This type of take-off was really a farce and one might just as well chuck the model into the air. To the organisers it was a gift from heaven, for change in the direction of the wind did not matter and one could shift the whole take-off area at a moment's notice. With enough timekeepers things went much faster and everybody was happy. But there was a loss in engineering know-how and the models did not use up power or time of engine run, so they flew a good deal longer. That resulted in the wellknown multiple five minutes – later three – 'maxes' and fly-offs, which many still think is a crude solution. But flight duration is another matter. From the very first the duration of a flight was rightly taken as a measure of the quality or at least the performance of the model. Times rose from seconds to minutes and I well remember how puzzled we were to learn that a twin pusher, nothing but wires and drag, had exceeded two minutes. That was in the days when even the pioneer

German glider pilots used the rising air on the windward side of hills, and thermals were only for the birds, until Austrian Robert Kronfeld fitted a mysterious instrument in his beautiful glider and beat all the others. It was a simple rate of climb indicator and he could look for thermals and stay in them. Real thermal flights by models only came in the middle of the thirties and we were still excited and proud when our product 'went out of sight'. But it meant that duration of flight as a yardstick of performance was nearing the end of its useful life.

It was most unsatisfactory to travel hundreds of miles to an International contest and see one model, hooking what was likely to be the very last useful thermal of the day, put up a time that nobody could possibly beat. So the best flight of three was replaced by the average flight duration, but that did not provide a real solution, for a single flight of thirty minutes could still mean possession of the cherished Cup. In some countries the idea grew that, although soaring in a thermal did prove something – like a small rate of descent and good stability – the reward should not be quite so generous. Mathematical curves were introduced but the disadvantage was that it became impossible to say what one should score to beat the next man. It took some time to find the midway solution; give some rewards for soaring ability, but not too much. The maximum points-scoring flight duration therefore was fixed at three minutes.

continued on page 94

Contest day at Sudbury Hill in 1922. At right is A. F. Houlberg weighing in a typical pusher with boomed rear fuselage and twin props by C. A. Rippon (the 'Rip' of Ripmax) in forefront. Oiled silk covering used over braced framework.



Society of Model Aeronautical En
ANNUAL PRIZE

at the Abbey Motor Hotel, Leicester, No



Above: Derek Heaton and Malcolm Ross reaped their 'usual' harvest of hardware in C/L team racing. At right, speed flyer Mike Billington receives the Model Aircraft No. 5 trophy from Lady Harland.



Below: Julia Woodrow presents the Alan Woodrow Memorial trophy to Peter Halman who became the first recipient of this magnificent award after topping the FAI speed team trial results.



Upper left: Roger Baggott receives the Hamley Trophy from Lady Harland, who so charmingly presented all the awards. At left, Bob Morgan took the striking Whitney Straight award for combat. Below left is the Women's Cup winner, Linda Hopper - what will happen to this award now that Sexual Equality is with us? Below right is Junior member Nicholas Meager. He won the Model Aircraft No. 1 trophy for his efforts in speed flying. At right is Joe Barnes with the beautiful Fred Boxall Trophy - he also collected the Weston Cup.



Engineers Ltd.

EGIVING

November 22nd 1975



Above left: While SMAE President Air Vice Marshal Sir Bernard Chacksfield KBE takes the microphone, Vice President Air Commodore Eric Baddeley (far left) awaits his turn - SMAE Chairman Jack Hartley sits between the two honoured and highly entertaining, speakers. Above right: Ian Fairgreaves looks understandably pleased with the KMAA trophy he is about to receive from Lady Harland. Julian Hopper (right) received not only this Quickstart Trophy, but also the White and Flight Cups.



Our columnist Eric Coates recaptured the Super Scale Trophy for winning F/F scale at the Nationals after 'loaning' it to Terry Manley for a year (above)



Sean Bannister (right) won the R/C Multi-task thermal soaring event at the Nationals-hence the PAA trophy he receives from Lady Harland.



Wal Cordwell collected the R/C scale trophy on behalf of Mick Reeves who was unable to attend (see left)



Guest of honour Air Marshal Sir Reginald Harland KBE, Air Officer Commanding in Chief, Support Command RAF, and President of the Royal Air Force Model Aircraft Association, gave an interesting, amusing speech - a real friend of the SMAE.

UPDATING THE *LIVELY LADY*

with the installation of a Maxaid circle-tow unit — detailed by Elton Drew

REGULAR READERS of the *Free Flight Scene* column will be aware of the recent introduction of the 'Maxaid Circular Tow System'. The November issue contained details of this unit which, essentially, is a development of the device described in Part 3 (September 1975) of the author's earlier series on *Circular Tow*.

The Maxaid unit came into being when it was realised that many glider fliers, keen to join the evergrowing ranks of circular towers lacked the facilities, or perhaps the inclination, to produce their own devices. Many modellers are unwilling to expend much time and effort to provide themselves with such a facility when they consider that the occasions on which its use would really pay dividends could be somewhat limited; typical British contest conditions being what they are! Equally they are well aware that, on some occasions, if one wanted to win, and presumably that is the name of the game, circular tow capability would appear almost a necessity. With increasing regularity con-

test reports of events in 1975 have highlighted the benefits that can accrue to the users of circular tow.

Hence the conception of the Maxaid unit: all glider fliers now have the opportunity to provide themselves with a circular tow capability 'off the shelf'. This simple and versatile unit can be slotted into virtually any glider, in much the same way as one would fit a timer. Its light weight and compact size suit it to all sizes of model from A/2 down to A/1 and smaller.

Installation in any model should present few difficulties and the purpose of this article is to describe its application to an otherwise standard *Lively Lady*, drawings for which are available through the Aero Modeller Plans Service as order no. G1073 price 75p. Over the years this now well established design has shown itself to be an ideal subject for circular tow. In the hands of various modellers many different circular tow systems have been employed, from the simple offset arm set-up through to the full

Russian Hook. *Lively Lady* has a reasonably high 'still air' potential and is well able to take full advantage of the benefits to be gained from circular tow on the occasions when drift is light or non-existent. The design has a good performance in more lively air, and should the air become more 'lively' than comfortable for circular tow one can with this unit, lock out the circular tow mode and resort to conventional straight tow, though of course still employing the 'ring and spring' method of towline connection. This means that one has no need to have a separate model for use exclusively as a circular tower, and the addition of Circular Tow to a *Lively Lady* makes for an even more versatile contest machine with the potential to win over a wide range of conditions.

Installation

The conversion of an existing model is easily accomplished in an evening, and the installation is even simpler if being incorporated during the construction of a new model. The ensuing description should be followed in conjunction with the instruction leaflet included with the unit. The pack contains all the items necessary to complete the installation, except for the modified timer activation.

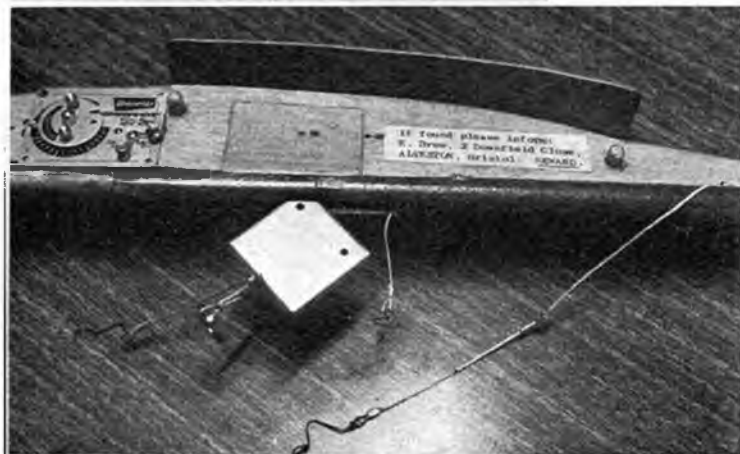
For obvious reasons circular tow flying is inconceivable without the use of a clockwork D/T timer activated on release of the towline and with this installation the timer 'on-off' switch is coupled directly to the Circular Tow unit. This requires the addition of a wire extension loop, soldered to the brass trigger of the unit as shown in Fig 1. It should be noted that flying with the Circular Tow mode locked out will call for the attachment of two nylon latch lock lines to the towline hook in the manner described in the instruction leaflet; one line to lock the unit in the straight tow position, and one to hold the timer off via the glide turn latch.

The first piece of surgery to be conducted on an existing fuselage involves cutting out a new recess on the nose as close as possible to the wing L.E. position to minimise C.G. shift. The original timer recess is then filled with balsa block and covered with 1/32nd ply. The latter is fitted flush with the existing fuselage side. The use of '5 minute' epoxy for this operation will enable the next stage to be commenced without undue delay.

Remove and discard the original towhook; it is now redundant. Mark off the position of



At left is the contents of the Maxaid CTU pack, which includes spring and hook for towline connection, nylon coated stainless steel A/R line plus nylon line for latch lock, as well as mounting hardware. Below is seen insertion of CTU in fuselage slot - note repositioned D/T timer.



the C.T. unit aperture using the dimensions shown in Figure 2. This elongated slot allows a range of fore and aft towhook positions. The slot is produced by drilling a series of $\frac{1}{16}$ in dia. holes right through the fuselage, i.e. fibre glass rod, pod and wing mount, and filing out to a width of 0.2 in (5mm) ensuring that the unit is an easy sliding fit in the slot. The drilling of the $\frac{1}{16}$ in holes is best accomplished using a drill pedestal stand but can be done satisfactorily by hand with care. It may prove necessary to produce a hole to accommodate the Auto-Rudder line in the rear of the hardwood insert which previously served to hold the towhook attachment screws.

Turning ones attention next to the rear end of the fuselage, note the position of the rudder for both tow and glide settings before removing the original Auto-Rudder line and the wire horn and adjustment saddle. The latter items are best cut-off with wire cutters and filed flush. The dural horn supplied with the unit is then epoxied to the rudder as shown in Figure 3.

The new Auto-Rudder line is inserted through the existing rear outlet tube. You will find that the nylon covered stainless steel line supplied can be easily pushed down the glass fibre rod to emerge at the unit aperture. The unit end is then formed into a small loop and secured by the crimping of an aluminium ferrule with pliers. The Auto-Rudder line is next connected to the unit using a soft wire connector and the unit inserted into its most rearward position. The position of the holes for the 10 B.A. mounting screws (drill No. 51) are readily determined using the template incorporated in the instruction leaflet. Whilst my conversion used fixed mounting positions an idea seen on an installation carried out by Martin Dilly might well prove beneficial to copy if frequent juggling with the hook position is envisaged. This merely replaced the mounting holes with slots running fore and aft. Tightening of the mounting screws

securely clamps the unit in any desired fore and aft position.

Connection of the Auto-Rudder line to the horn adjuster screw, using a soft wire connector, is carried out in a similar fashion to the connection at the unit end. The length of the line should be made up such that, with the Tow Ring Latch fully forward the rudder is in the straight tow position when the nylon adjuster nut is positioned towards the forward end of its range of adjustment. This will enable the adjuster nut to be moved aft if it is desired to move the unit to a forward position.

The straight tow and glide turn rudder settings should be provisionally set-up as near as possible to those noted previously and the circle tow setting set a little in excess of the glide turn position, say about an extra $\frac{1}{8}$ in offset.

The timer can now be be connected up to the previously modified tow unit trigger. A wire adjuster as shown in Figure 2 accommodates variations in fore and aft position of the unit and permits minor adjustments when setting up the system. Ensure that the Circular Tow unit's glide turn latch movement is not restricted in any way by the timer 'on off' switch and that the timer is fully on when the glide turn latch is free, i.e. in the glide turn position.

It will be necessary to add an extension piece to the D/T line to suit the revised timer position, or alternatively replace with a completely new longer line.

And that's it. You are now ready to join the Circular Towing revolution.

Flying

The actual technique involved in effecting the release of the towline with the 'spring and ring' system has been fully described in my earlier article (Part 2, August 1975) and is covered by the instructions. Suffice to say here that it is relatively easy to adapt one's flying technique to suit the 'spring and ring' towline release method but it should be remembered, particularly if one has been flying gliders for any length of time, that 'old habits die hard'. However, even old hands at

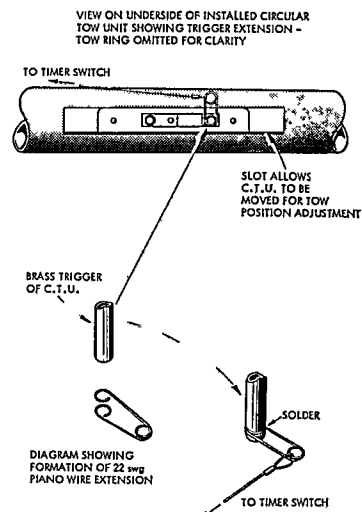
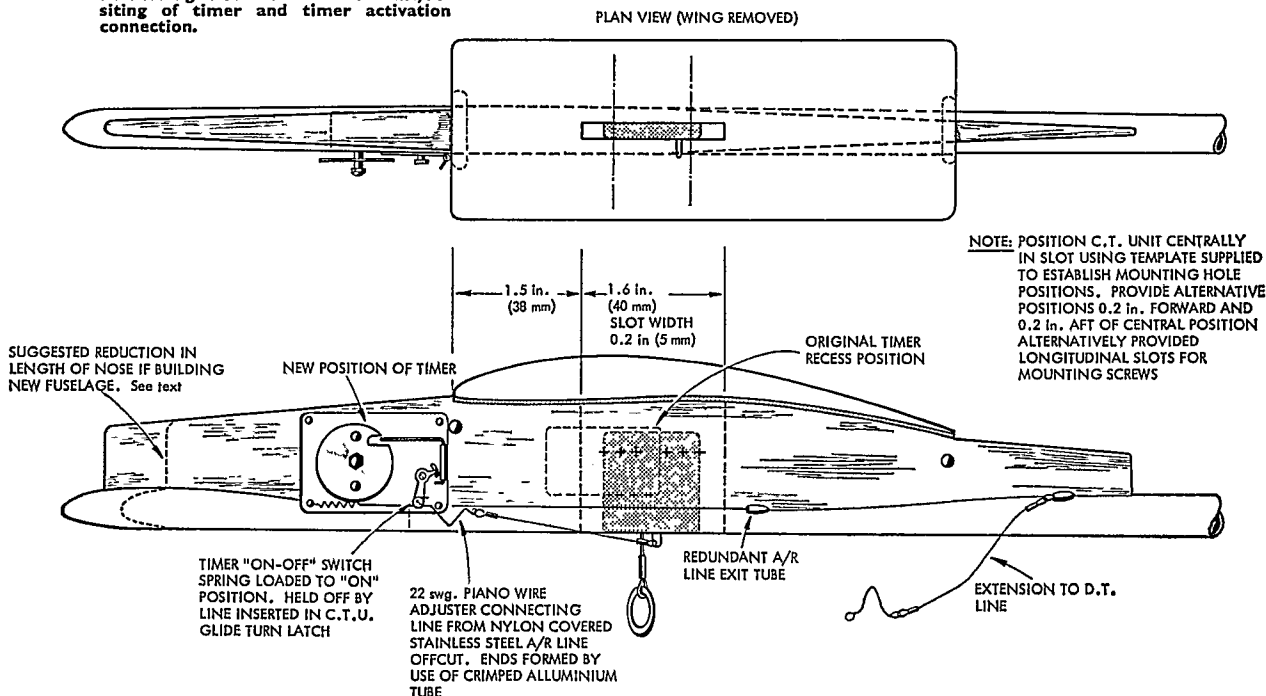


FIGURE 1

the game seem to manage the transition with little difficulty, once they get used to the fact that release of the model demands a tight line. Any initial doubts one may have about this method of release will probably be quickly dispelled by the newly acquired confidence, introduced by the fact that an unintentional release, particularly when flying in zero drift conditions, whilst not completely impossible, is now an unlikely occurrence. When flying in light gusting conditions one is also free from any problems of premature release due to a latch unlocking as can occur with the Russian type circular tow systems.

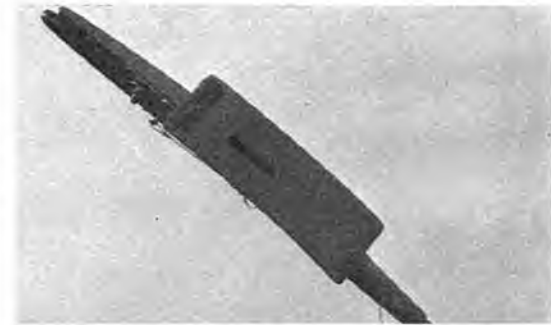
Some retrimming of the model may be necessary due to the slight forward C.G. shift attendant on moving the timer forward. The model can readily accommodate this C.G. shift and no adverse effects have been noticed on the author's conversion. Testing

FIGURE 2
Positioning of 'Maxaid' circle tow unit, re-siting of timer and timer activation connection.





View on underside of fuselage showing Maxaid CTU in slot - also the wire trigger extension for timer connections. Unit weighs just 8 grammes and measures 30mm x 30mm x 5mm.



Slot for the CTU is cut right through the wing mount. Maxaid circle tow units are available from Maxaid Modelling Products of Downfield Close, Alveston, Bristol BS12 2NJ - price £3.70 including post.

should then merely be a matter of checking out that the straight tow and normal glide turn rudder settings transferred from the original set up still hold, and establishing a suitable circle tow turn. The latter essentially involves obtaining the tightest desirable circle but avoiding any tendency for the model to wind into a spiral dive on the line.

One effect of the tight turn, desirable to reduce the amount of legwork involved, is to produce an underlevated condition and this, combined with the drag of the towline, results in a higher sinking speed than when in the free glide. This, whilst demanding some extra effort to maintain the model

aloft, can prove a decided asset for thermal detection in some light lift, low drift, conditions. If the model circles on the line, and is maintaining height, one has a certain indication that the model is in lifting air.

Having arrived at the desired turn, both on and off the line one should then obtain as much practice as possible. Only when one is fully familiar with circular tow techniques, the models behaviour on the line and its response to the various demands of the tower, can the full benefits of the circular tow system be realised and achieved. It is important also to learn the limitations of circular tow flying, and perhaps most important, to

acquire the ability to decide when and under which conditions to employ circular tow. With this system one can of course revert to straight tow at any time with the model on the line provided line tension is maintained or, if desired, completely lock out the circular tow mode.

Footnote

Should you be installing the circular tow unit in a new *Lively Lady* fuselage starting from scratch, the installation is even simpler as the apertures for the Circular Tow Unit and timer can be built in to suit and the hardwood insert in the boom, necessary for mounting the conventional towhook, omitted. However, one point needs emphasising, and this is applicable even if you are not contemplating installation on a circular tow unit. The original *Lively Lady* employed a glass fibre boom somewhat heavier than the current Ronytube item and the noseweight and noselength dimensions quoted on the plan were relevant to the heavier boom. There has therefore been a tendency for builders to find their versions coming out slightly nose-heavy, so it is recommended that the noselength is reduced by 2in. This will allow an adequate margin to restore the C.G. to plan, with or without the revised timer position, additional ballast being added to the nose compartment as necessary.

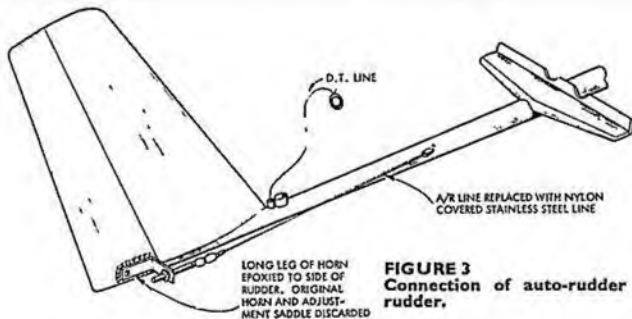


FIGURE 3
Connection of auto-rudder line to rudder.

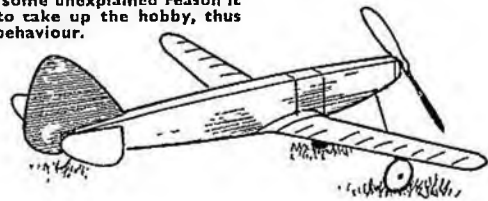
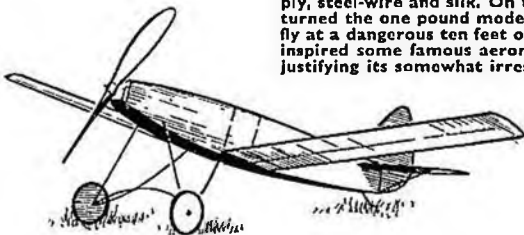
THOSE EARLY DAYS *continued from page 89*

That led to dethermalisers of which Carl Goldberg's tip-up tailplane proved highly superior to all the weird gadgets, like reels of cotton at the wingtip, parachutes, etc. Goldberg also deserves our gratitude for showing that a power model was easier to trim when the wing was put on a tall 'neck', and that was before World War II.

But competition improves the breed and in spite of rigorous measures to reduce unwanted time of flight - like increasing power-loading

in Wakefield by steadily limiting the weight of rubber and lowering the engine capacity as well as increasing the all-up weight in Power - 'maxes' continued to increase unnecessarily and the fly-off became a problem. That reached a climax at Cranfield in 1960 when 17 rounds failed to reduce the number of finalists and so the exercise began to look like a test of nervous stamina (the present CIAM Chairman Sandy Pimenof was one of them - and I believe the youngest of the lot) so eventually the slaughter

Geared rubber model with box-type fuselage, fairly representative of the designs current in the early thirties when low-wing layouts were quite popular and motor run was considered more important than duration of the glide. Model was still built of hardwood, three-ply, steel-wire and silk. On the right is a later development which turned the one pound model into a 30mph plus racer, trimmed to fly at a dangerous ten feet or less. For some unexplained reason it inspired some famous aeromodellers to take up the hobby, thus justifying its somewhat irresponsible behaviour.



was stopped. Then came increasing times for successive fly-offs, but that is later history.

With hindsight one may wonder why it took so long and so much effort to reach the 'solutions' as we know them today. But are they solutions? It is only when you look at aeromodelling as a succession of contests that these things seem to matter. There are thousands who couldn't care less and I should perhaps say hundreds of thousands all over the world. That will be a subject for my next ruminations, always assuming hopefully that two or three readers will stay with me.

“HEAD EAST YOUNG MAN”

Gary Frost travelled from the United States to fly combat at the British Nationals, and gives his thought-provoking views on techniques, rules and safety.

Spearhead of the American invasion at the '75 British Nats were Charlie Johnson (left) and the author Gary Frost. Both used scaled-down Open Combat style models - glow powered, of course - which use Fascal covering. This is a transparent mylar type covering, but much stronger than normally available films. If you want to try a sample, drop Gary a line for details.

COMBAT AT the 1975 British Nationals was entered by two Americans: Charlie Johnson of San Diego, California and who is President of the *Southern Californian Control Line Association*, and Gary Frost, of St Louis Mo., President of America's popular *Miniature Aircraft Combat Association*. I think Charlie will agree with me that we both had a ball, learned a lot, and met many new friends.

I would like to share with those new found friends some opinions and comments about the extremely tough and competitive British Nationals, but it would not be fair to do so without first thanking everyone I met for their consistently friendly and helpful attitude. The British flyers, even though they were our competitors, went out of their way to help in every possible way. Once again, it has been shown that modellers are the greatest people on earth. And a special thanks goes to Dave Clarkson of *AeroModeller* fame, plus John and Shiela Daly, who provided room and board for Charlie and I, and made us feel at home.

I want to compliment *all* British combat flyers as being excellent pilots. You are aggressive, quick, accurate, and persistent. You flew with considerable skill, and turned every defensive manoeuvre into an offensive one, even though you were often at a disadvantage equipment-wise. I have been to many contests in the US, and always there has been a mixture of skill among the pilots - the first matches are rather easy and difficulty increases as the contest progresses. Not so in England! I saw no such thing as an easy match, and I had to fly hard every second of every round. My hat is especially off to the winner, Bob Morgan, who flew expertly all day, and who flew a tremendous final against a well piloted and faster glow powered plane, and who emerged the winner - uncut! Congratulations Bob. You are on top of my list.

I think the appearance of American competitors in the British combat circles has had a definite effect. Most markedly, our visit has helped, and will continue to help accelerate the use of glow motors as opposed to the diesel. I predict that by next year the entries will be equally divided among glows and diesels, and the increase will continue in favour of the glows.

Why? Speed is not all-important, but it does help in a combat match. I find it comfortable to know that if I'm in trouble then I can always simply outrun my opponent. Not so if I'm forced to manoeuvre all the time. Glow motors do develop a lot more horsepower than the diesels,



and as you saw, the *Outlaws* team used that horsepower potential well. In an attempt to increase the performance of the diesel planes, many deviated to the lighter Solarfilm plastic covering. Everyone knows that if the plane is lighter, and everything else is equal, the wing loading is less and the turning radius smaller, assuming adequate power. But no one gets something for nothing in this game: Mylar covering is relatively weak, and now the before ignored ground becomes the enemy to the British combat plane.

The destruction rate of combat ships this year alarmed many people. No one likes to have to come to any contest with a dozen or so planes, and many others simply cannot afford that many planes, even if they have the time to build them. So I heard rumours that a rule was being prepared to prohibit the use of Mylar covering. This is a noble idea, but a *bad* solution in my book.

I noticed that the British pilots love to follow their opponent all the time. Some of you may change that policy. Keep in mind that if you are following me, then I am in control of your actions, not you. Therefore, do not do the same thing twice in a row, or else you may be in trouble. And I suggest you guys trim your models to fly upwind - that part of the circle proved to be a peaceful spot! It was humorous to watch the props almost stop on some diesels as they attempted to go upwind. Put some more nitro in 'em, guys.

A spin-off from the British attempt to get higher speeds may well be in airplane design itself. I understand that you believe only wing area and moment arm affect the turning radius of an airplane. And for the speeds you are now flying, that theory appears to hold out. But what happens when you do go faster, and you try to turn just as tight? I say you will then discover too much loss of speed in consecutive manoeuvres and to that I say put an *airfoil* on it guys! Turning radius is no good if the plane stalls for loss of airspeed. I will admit the turning radius on a typical British plane appeared to be less than on my airplanes, but you should have noticed that my planes completed the turn in much less time - that too is equally important. Everyone thinks his plane flies through turns well, and we need some kind of a measuring stick to gauge relative 'turnability'. I suggest you time your plane and see how long it takes to complete seven complete loops. Size and absolute speed is whatever you want it to be. Naturally the tighter the turn, the slower. What kind of numbers do you come up with? Should be less than 7 seconds.



The Mexican contingent at the 1975 U.S. Nationals - hopefully, a pit crew that large is not necessary to service a single slow combat model . . . And if that fella with beard and sun-shades looks familiar - you're right, it's 'our man' at the US Nats, Richard Wilkens.

The rules

Where would a discussion of combat be without mention of rules? It seems that in the United States, no good combat contest has been held without several heated arguments and I think that will always be the case, no matter how many and what kind of rules there are. Nevertheless, I think the British Nationals demonstrated some rule fallacies, or at least some viewpoints. And I do not mean that as an indictment of any of the rule makers - we have to realise that you have to try something to be able to analyse it. But then too you have to be open minded when a change is needed.

Let me get on the soapbox for a minute. Any rule is only as good as it is enforced. A pre-requisite to enforcing rules is understanding, and that includes officials as well as contestants. Many of the problems associated with poor rules, are merely the result of poor rule understanding. Maybe we should require everyone to take a test before they are allowed to fly combat, and maybe then more than 5% of the people would understand what is happening!

The first problem was apparent even before flying. Richard Evans posted a sign on the back of the combat control tent which said something to the effect that 'anyone deliberately staying on the ground would be disqualified on the basis of ungentlemanly conduct'. Rich and the officials of the contest obviously feel that combat is a flying game not a ground game. This is a contest of skill, and a lot of us are good at catching up at the latter part of the match without prior warning to the contestants, hence the sign placed conspicuously for all to see and discuss before flying begins. This approach is *absolutely correct*. I urge supporters of this interpretation to submit comments to your FAI delegate for 'official' consideration. Don't expect him to do all the work for you.

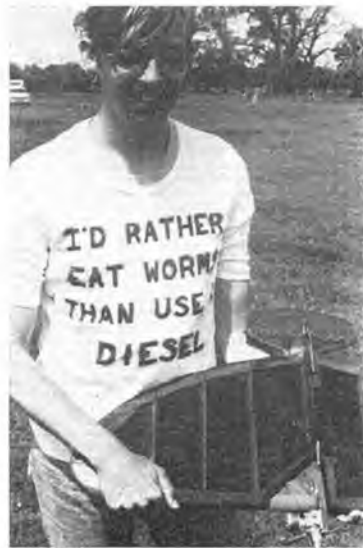
I have found a few weaknesses myself. Section 6B, second sentence of the F2D rules, states "*The control handle must be built so that the distance between the axis of the handle and the point of attachment of the two lines does not exceed 40mm (1½in.)*." I propose changing the sentence to read, "*. . . point of attachment of the two lines does not exceed 177.8mm (7in.)*." Why? There does not exist within the US or UK any commercially built handle that will meet the existing criteria. It is difficult to self construct a handle to meet the standards of usefulness and the 1½in. criteria. There is no safety feature, no advantage of the 1½in. restriction, and conversely, no adverse effects

of extending the 1½in. to a workable dimension. The suggested dimension is ½in. longer than the most widely used handle in the US, the *EZ-Just*, although the exact number of inches is not important. What is important is that we come up with a usable number so that we can work with the rules. The 1½in. restriction does not exist for FAI Speed, Team Race or Stunt, why combat?

Let's talk about the rule which says you must first switch the streamer to your back-up model before launching it. That sounds simple and basic enough but what if your lines are cut? When this happens, what is the pilot supposed to do while his pit crew runs for several minutes chasing the model? Mismatched lines can aid a cut of the flying lines at any time. It is a luck (bad luck) factor - it can happen to you, and when it does, the rules do not allow for a reasonable solution. In fact they encourage deliberate foul play.

I was down for about 1½ minutes when the same thing happened to me at the British Nats. That is equal to one full cut in points, and the whole thing is not at all con-

Chuck Thomas, an American serviceman based in the UK at present - and member of the Outlaws pit crew - models the t-shirt presented to him by the author. Hope you enjoyed your breakfast Chuck - that looks like an Oliver powered model in your hands . . .



Winners of the Senior Fast Combat event at the last US Nationals were (left to right) winner Tim Flake, who headed Victor Radisi, Rodger Wheeler, Bill Roland and Bill Magwald. Obviously, some models stayed the course a little better than others... Note the popularity of sheeted leading edges and boom-mounted elevators.



trolled by the pilot who is affected. What happens if the model is never caught? I propose adding a new section to existing section 13, called 13c, to read, "In the event of a model flyaway in which the airplane and streamer may not be retrievable due to the distance flown, the affected pilot/pit crew may elect to use a new, full length streamer instead. This new streamer shall be immediately available from the circuit marshal or judge". Here is where some of you say, 'wait a minute, we've got to get some control here'. Fear not! This concept is self limiting. Naturally the pilot would not choose to use a new streamer unless he had to, for to do so would give his opponent a bigger target - isn't it easier to cut a long streamer? Still, I'd rather get in the air than to see my pit man run until his legs give out.

My next point must already have reached the rule-making people, for there has been a change just recently. Why was section 11d added to the rules? This states that no points will be given for cuts on the string line, even if a piece of streamer is removed. This poor rule could serve to stifle aggressiveness if literally enforced. What this rule says is: "here is a target that is being pulled around, if you hit it here you get 100 points, but if you hit it there you don't get anything." And that could mean a win or a loss, and since there is no second chance, you are out.



Here is an example of unsafe contest (flying) practice with the pilot manoeuvring over the heads of the pit crew. Note that the pit crew members are unconscious of the flying plane and therefore are in no position to avoid it. The pilot is trying to keep his plane in a position to attack the launched plane, and is therefore not watching the pit crew. What prevents an accident as soon as the second plane is launched? See text.

This is roulette! There isn't a combat flyer in the world who can consistently hit the streamer exactly where he wants to, so this introduces more luck into a potentially pure skill game. I propose we should delete section 11d entirely, and replace with "No points shall be awarded for cuts on only the string line. If a remaining portion of the streamer is cut at the same time as the last portion of the string, the cut and 100 points is allowed."

Now I'd like to talk about the function of the centre circle marshal. Is it necessary that he should be just outside the pilot's circle? If so, then we need to more closely define his duties and give him some more equipment. The marshal has to start the action, watch pilot conduct, give permission for the pilot to leave the circle, and time the four remaining minutes of combat. And if he does all that, he cannot watch cuts also.

If the marshal is to remain in the centre, I think everyone should be aware of a disadvantage. Having him there separates him from the two judges who are measuring individual flight times and counting cuts. Remember the circle marshal is recording total time. How then, if both planes are flying at the end of the four minutes, does he get the attention of both the judges (who are not watching him, but the planes) to get the watches immediately stopped? There has to be a lag in the communications, and in the case of a very close match, this inaction could determine the winner.

As a suggestion, the marshal could carry with him an air horn, which would be used to signal the end of the match to the judges at the same time as the pilots. For those of you who may agree with this, remember this is not required in the rules - yet. An alternative would be to supply a separate watch to the airtime judges - this could run independently of the circle marshal's watch, and also serve as a back up in case of watch malfunction.

I think the conduct of the centre marshal at the British Nats was excellent. Here again, the sense of fair play was shown when they decided to first warn or remind the pilots who inadvertently stepped out of the centre circle, rather than just automatically penalising them. I'd like to see the statement of warning added to the rules. How about you?

Safety

Now for my harshest criticism. Flying combat is fun, as long as no one gets hurt. I have noticed a definite safety problem, due to rule deficiency, and sadly the British have not used their wisdom to solve this problem. In the US the rule making body of the AMA is very safety conscious and while we sometimes get ridiculous in the misused



Richard 'Wilkie' Wilkens with his one and only 'Fast Blasta', which he built while in the United States, and flew at their '75 Nationals. Basically just an enlarged 'FAI Blasta' (plans to be published soon, incidentally) it was much bigger than American models, and although down on power, was highly manoeuvrable and thus competitive. Very light construction employed - it was not designed to hit the ground!

name of safety, in the case of F2D combat, I do not feel we have progressed far enough. Either extreme is equally bad.

Why is it necessary for the opposing pilot to manoeuvre over the heads of a pit crew who are trying to restart a downed model? As a combat flyer I say there is no advantage in this. Even if there were, is it worth the risk of injuring someone? I witnessed one man get hit in the arm by a flying plane and I saw the control lines get wrapped around the neck of another pit man. Why have rules so poor as to allow this?

To remedy this situation several steps are needed which collectively solve the problem, and do so without being detrimental to the sport. First, pit crews must *not* be allowed to run through the flying circle to retrieve downed models. We need a rule which requires them to run round the outside of the flying circle, and then only enter at an angle of 90 degrees to the flight of the plane. Second, before the plane can be serviced, it must be pulled outside of the flight circle. I note the recent addition of the rules which state the plane must be pulled to the edge of the 19 metre circle before servicing. This is a step in the right direction, but is still inadequate - you need to pull the plane outward enough to force the pilot to leave the centre circle, then you don't have a plane flying over the heads of the pit crew. How about a new 22 metre circle? And you need a rule which prohibits anything but straight and level flight at anytime only one plane is in the air. Remember this is for *everyone* all the time, so no one is at more of a disadvantage. This is the procedure we use in the US, and it works beautifully. To accomplish same above, we will need to change sections 12, 3, 16 and 9 of the rules.

Now, I have taken away your game of jumping on an airplane (and the pit crew) as soon as the plane is launched. So how does combat resume? You could enforce a minimum of one lap that the second plane airborne must complete before combat can again start, or you could have the circle marshal again start the match, anytime he wants to, or again at the earliest quarter-lap separation.

I'm sure you can come up with equally acceptable solutions. However, I submit that anything is better than allowing the deliberate manoeuvring over the heads of a

helpless pit crew. I urge all of you to consider what I have just said; let's show the public that combat is a safe sport, and stop an accident before it happens.

My last proposal concerns the mandatory headgear. If you follow my preceding suggestions, it is unnecessary. Let's get rid of it! If an event is unsafe, then headgear only protects the head. What about the body, arms and legs? Worst is that this device only solves the *effect* of a safety problem, not the cause. By wearing headgear, we are admitting we are flying with a possibility of someone being hit - can't we make better rules to prevent this situation from occurring? We do not wear headgear in the US where speeds are higher, planes are heavier and therefore impact forces are greater. And it is safer than the existing FAI combat with the headgear!

World Championships?

The real purpose of American attendance at the British Nats was to promote combat as a World Championship event. The US is very much disappointed at the tentative decision not to hold combat at the 1976 World Champs. We have a team picked and we challenge the world. We have the best pilots, and we can prove it!

We feel that all reasons for not including combat are solvable. Where there is a will, there is a way. Think positive. What is the problem? - Rules? You have to try 'em to see what goes on. Housing? We'll sleep in tents. Room? You have a field right next to where the other events will be held. The US wants combat, the British want combat, and the Dutch flyers I talked to want combat. Who says no, and why?

M.A.C.A.

No discussion of combat would be complete without mentioning MACA. MACA is the voice of combat in the US, and is even being heard in some foreign countries. Anything and everything having to do with combat of any kind, anywhere, is within the boundaries of MACA.

Perhaps one of our biggest assets is our excellent newsletter. It carries news and ideas of US flyers. Due to postage handicaps we are forced to ask \$10 for each non US membership. This at least gives you twelve monthly issues of the newsletter and to defray this cost, keep in mind that clubs can join MACA as a group, as well as individuals.

Other MACA activities include a design/building contest, an award for the best crash of the year, a beauty contest, establishing the top flyers, establishing a 'killer of the year', technical reviews/critiques of products, establish a rules advisory committee, advertise specialty equipment, provide free T-shirts for the top ten combat flyers in the US and offer a swap shop. If you love combat, you need MACA. Send applications to: Tom Southern, 2207 Paul, Longview, Texas, 75601, USA.

Another fine combat publication is from Ron Kaptijn of Amsterdam, Holland. It is a quarterly publication, called *The Missing Link*. Cost is 5 Dutch guilders per year. Send your name, address, phone number and name of your club to: Ron Kaptijn, Schoonboomstraat 391, Amsterdam, Holland, and remit Hfl. 5.00 (five Dutch guilders) on the postal account 3325555. Ron is looking for your comments now.

As you can see, I love to talk combat, but must stop sometime. I don't expect you agree with everything I have said, but at least consider it. I'd very much enjoy your comments, pro or con. If you have comments, my address is: 22 Glynn Dr., Florissant, Mo. 63031, USA.

In closing, as President of MACA, I give you this warning: watch your streamer closely . . . you never know when an American plane is cutting it!



The Free Flight Scene

This month:
Martin Dilly

BECAUSE OF publishing deadlines and the fact that Bob, Michael and I each write a *Free Flight Scene* at three monthly intervals, readers' replies to points we make in the Columns appear a trifle late, rather like a dialogue with the outer planets. Anyhow, Pete Farrimond takes me up regarding the technique of releasing the bottom end of glider towlines during launch.

"Let us first of all examine the merits of the system.

For: (1) *Trouble is never experienced releasing the model, invaluable under certain circumstances, e.g. line tangles in a mass launch.*

(2) *The model can either be catapulted or floated off the line.*

(3) *The type of towhook necessary for this system is simpler to make and install than any other published system of catapult hook.*

Against: (1) *Line tension must be maintained while towing, otherwise the model can fall off the line.*

(2) *It is not always a quick process to retrieve the winch end of the line after launch (one of the problems spotlighted in *Free Flight Scene*).*

After the pros and cons of the system, what about the ethics? I do not dispute the fact that the released line can drape over other lines, but is this sufficient reason to keep other models grounded? Let's face it, there is no weight on either end of the line, so what havoc would be caused? Damage can be caused by a line being winched in across others, but I don't hear any arised voices advocating this until all models are airborne!

I think you will only get complaints regarding this system under mass launch conditions when anything can, and will, happen. There are no problems if the flyer goes upwind on his own and releases the line, there are no problems if he follows the bunch and releases the line, the problems arising when the bunch follow 'our hero' (piggy-backing for want of a better expression).

If, (a) he gets good air the bunch follow; (b) he gets bad air the bunch wait. In the case of (b) there are no complaints; in the case of (a) there could be, but is it fair that the flyer should be penalised for finding 'good air' as the others just stand and wait for someone going first? If it is just a question of line tangles, can one envisage 20 or 30 people circle towing together, or if it gets that bad will the cry be 'Ban circle towing'?

No, the system is OK, it is safe to your model and others, and if people want yet another excuse to shout 'line tangle' at the first opportunity, I am sure there are other means not yet publicly known, to be exploited."

There are quite clearly those as much in favour of this system as I am against it. Valerij Ekhtenkov at Plovdiv did not even have a winch with him while towing, and was dragging his 50 metres of line behind him on the ground till after his model landed. Certainly I would be reluctant to start towing any glider of mine knowing that another towline was draped over it. Even if 'our hero' releases into bad air and there is no immediate mass launch, under his aircraft, it could well be that somebody trapped by his loose line might want to tow for his own lift.

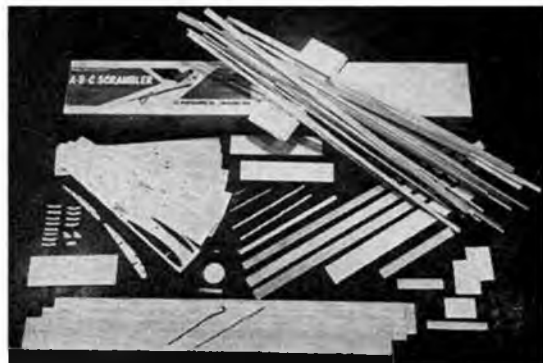
Regarding line crosses, it has been suggested that the whole principle that a line cross entitles a competitor to a re-flight if he so wishes should be abolished; certainly there are people who 'insure' their flights by crossing another line, and claim another attempt if they fail to max, even though the line cross made no difference to their launch. Indeed with circle towhooks a mere line cross is unlikely to cause premature release.

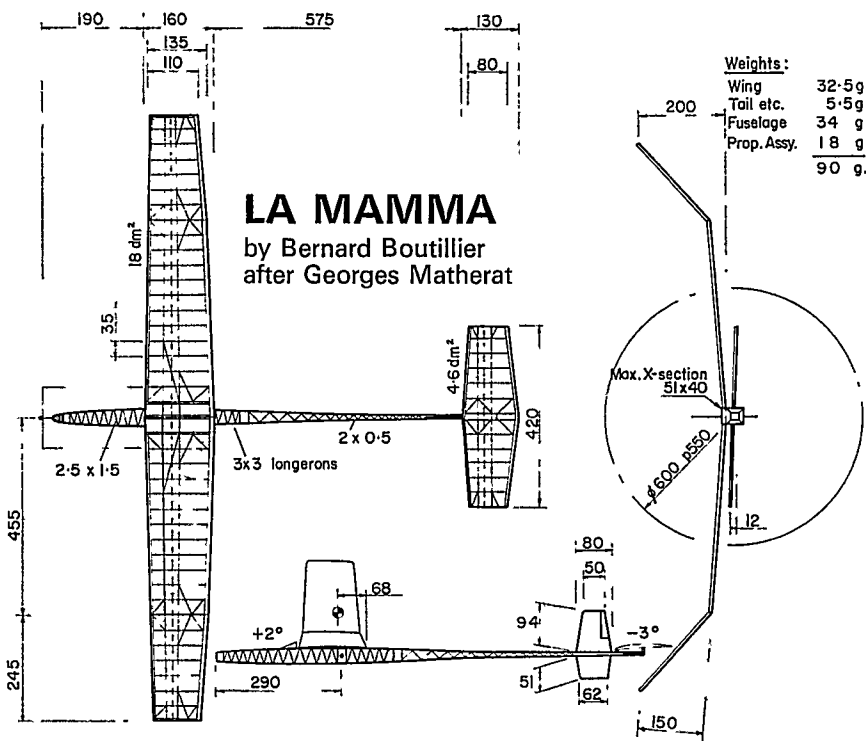
But if every flight is to be a scoring attempt when the pennant releases from the model, the 'innocent' flyer whose model is released prematurely will be penalised. How to decide if a release is inadvertent or not is the \$64 question; at present even the line cross itself is missed by the timekeepers as often as not. The more cynical reader could perhaps foresee a situation when a flyer 'sets on' a high-placed member of an opposing team during tow to literally knock him out of the running by obstructing his launch. Read on for latest details . . .

1975 CIAM MEETING

At the December meeting of the *Commission Internationale d'Aeromodellisme*, the governing body for worldwide model flying held in Paris, relative sanity prevailed, at least in the case of most of the proposals regarding free-flight. Those from the USSR to reduce the F1A towline length to 35-40 metres, and to reduce Wakefield motors from 40 to 30 grammes, with a corresponding airframe increase of 10 grammes, were rejected. The reasons put forward in support of the proposal were that too many were reaching the fly-off; the majority of the 21 national delegates and observers at the F/F technical sub-committee meeting felt that the correct way to overcome the problem is to ensure that contests are not flown during the most thermally active part of the day. The organi-

At left: 1973 World Champion A/2 glider flyer Valerij Ekhtenkov. At the 1975 Champs, he towed for his own lift at the start of each round, rather than rely on 'piggybacking'. Below is the Sig ABC Scrambler kit for a 570sq.in. Open Power model, using .15-.35 cu.in. motors, now available from H. J. Nicholls and Son Ltd, 308 Holloway Road, London N7. Perhaps a little outdated with its high thrust line mounted motor, it is nonetheless a good performer and very good value at £7.95.





sers' recommendation brought in after the 1973 World Championships at Wiener Neustadt (which produced similar Soviet proposals to change the model specifications, after 42 reached the A/2 fly-off) was worded so that it appeared that the early and late flying was intended to prevent models flying out of the airfield, rather than to avoid large fly-offs. In any case it was only a recommendation. It is essential that at the next CIAM Plenary meeting in December 1976 the *Sporting Code* is altered to make it mandatory to plan rounds so that as many as possible take place when wind and thermal activity are at a minimum.

Another Soviet proposal, allowing Wakefield and F1C flyers to launch from anywhere on the airfield in sight of the timekeepers, was also rejected.

Proposals from the Netherlands and the German Democratic Republic together will alter the line cross situation with A/2s. The new rules, effective from 1st January 1976 are as follows: "3.1.5. (e) *The model or the launching cable collides with another launching cable during towing (linecrossing) and the model is released from the cable within one minute from the moment of linecrossing. Should the model continue its flight in a normal manner, the competitor has the right to demand the flight be accepted as an official flight, even if the demand is made at the end of the attempt.*" "3.1.6. *An attempt may be repeated when the model collides with another model in flight, or a person while being launched. Should the model continue its flight in a normal manner, the competitor may demand that the flight be accepted as an official flight, even*

LA MAMMA was flown by Bernard Boutillier of France to win the MRA Challenge Cup for 100gm Coupe d'Hiver models at RAF Halton. The airframe is enormous, as can be seen from the 3-view above and the full size propeller blade and wing sections drawn at right. The motor used was 6 strands of 6 x 1mm Pirelli which gave a motor run of 52 seconds. The fuselage has an internal tube of polyester film, weighing 7gms, to protect it from motor breakages. Also, the fuselage carries 4gms of lead 70mm behind the wing trailing edge. Covering is lightweight Modelspan tissue, with two layers on the first six bays of the wing, and on the front underside of the fuselage. The complete model is sprayed lightly with clear Hobby epoxy. Trim employed is right-right, with tilted tailplane and trim tab, plus very slight right and upthrust.



1975 was the first year in which Japan fielded a full team in person at a free-flight Championship - and they all reached the Power fly-off. Left to right are Masuda, Miyamoto and Kibiki.

Prop. Blade Profile.





Now available from World Engines is this magnesium alloy speed span – equally suitable for free-flight or control-line speed. Will accept Rossi or Super Tigre 15s. Price £3.75.

if the demand is made at the end of the attempt. During towing, one timekeeper looks at the flag and starts both stopwatches. The other timekeeper looks at the towline to detect collisions and tanglings, and he will time the one minute period as mentioned in 3.1.5.e) in case of a linecrossing. As soon as there is no more risk of collisions and tanglings, he takes his stopwatch and continues normal time-keeping."

This should at least avoid some of the 'insurance line crossings' that have happened in the past, although we are still left with the problem of actually spotting the line cross.

The meeting in Paris was notable in that a much larger proportion of delegates and observers are actually people involved actively in competitive free-flight: Tom Køster represented Denmark, Peter Allnutt was a Canadian observer (and was elected as F/F technical committee chairman, replacing Italy's Luigi Bovo), Pierre Chaussebourg was a French observer, Ian Keynes is Britain's new FAI delegate, I represented New Zealand, 1969 Wakefield winner Albrecht Oschatz is the delegate for the German Democratic Republic, Hans Friis observed for Sweden, and the first Vice-President of the CIAM is Yugoslavia's Vilim Kmoch.

Thanks to three Danish proposals the 'one attempt' rule for A/2 and Wakefield fly-off rounds is deleted, 15 minute periods are now allowed for fly-offs, and the F1C section is modified to allow fly-off competitors to launch at any time during the new 15 minute period, with starting poles at least 10 metres apart.

In F1C this re-establishes the flyer's right to decide *when* he wants to launch; the ten metre pole spacing, coupled with the now well established fact that, even with other motors running nearby, it is far easier to hear a motor stop after a seven second climb than after ten, will all help to reduce 'over-runs' due to timekeeping errors.

A Dutch proposal that would have allowed line breaks to be timed as scoring flights was rejected, as was a proposed ban on 'impulse hook' systems, originating from Finland.

At the suggestion of the United States indoor (F1D) flights of over 60 seconds, rather than 30, now count as official. A long proposed rule change (3.4.7. in the *Sporting Code*) from the UK re-defines how an indoor model may be steered. The voting at the F/F technical meeting was close (4 for, 3 against, with 4 abstentions), largely because of the increased risk that some delegates thought might arise when trying to aim a long, balloonborne line between wings and revolving propeller, rather than into the larger gap between wing and stationary tailplane. Briefly, models must be steered only from in front of the wing, and all time during which the propeller is stopped due to line fouling is deducted from the total flight time, requiring the use of a third stopwatch.

A US clarification of the Coupe d'Hiver rules, separating the motor weight (10 grammes) from the airframe weight (70 grammes) was approved, but their proposal that the FAI should list provisional Coupe rule in two classes – 70 grammes, with 120 second maxes, and 90 grammes, with 100 second maxes – was rejected.



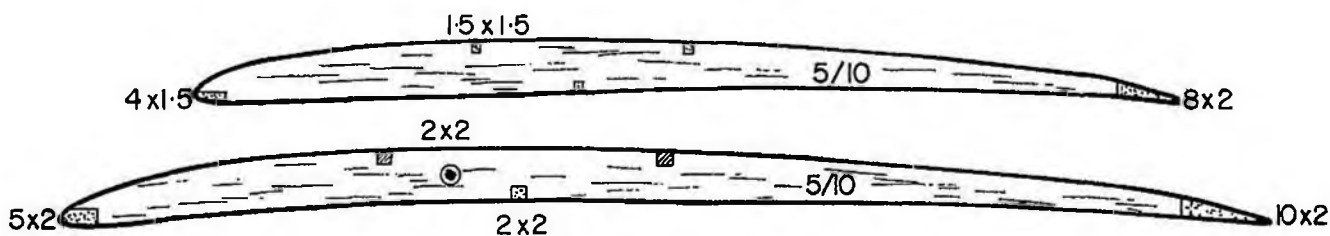
Richard Cedar of Croydon with his glass fibre fuselaged version of Vladimir Krejcirik's 'Vega', using a catapult hook as described in the July 1975 'Free Flight Scene'.

The UK also put forward a proposal for Easy B as a provisional indoor class; it seemed odd to me that, when making specification suggestions to an international organisation like the CIAM, Britain quoted the proposed maximum span as '45.72cm.', and chord as '7.62cm.', even if they are whole numbers of inches; the idea was referred back to the CIAM's F/F technical committee.

VLADIMIR KREJCIRIK'S A/2

Croydon club member Richard Cedar recently built a pair of *Vegas* (Krejcirik's A/2 that placed second at the 1973 World Championships) from the full-size plans published by the Czech magazine *Modelar*, a couple of years ago. Recently I spotted a piece in the same magazine warning that, due to a draughting error, the plans will produce a model 2.6sq.dm. *over* the maximum A/2 area of 34sq.dm. Apparently they were drawn 'by proxy', as Krejcirik was just starting his national service in the Czech army. Anyhow Richard performed some essential surgery on his wings and intending *Vega* builders should omit four bays from each inner wing panel, which puts the model within specifications again. Do not let this put you off the *Vega*, though; it is an ideal introduction to circle towing and, if you prefer, a glass fibre rod blank fuselage version seems to fly as well as the original balsa and spruce one.

At the SMAE/FFN/RAFMAA 2 Day FAI meeting at Sculthorpe Richard had a timer hang-up on one of his *Vegas*, which took off for the open spaces of Norfolk. A few days later a local farmer phoned to report its arrival in one of his fields and Mike Woodhouse



arranged to collect the model about six weeks after the contest: when he finally picked it up it turned out that the farmer had left the A/2 tied to a fence in the open like a shot crow. November in Norfolk is not renowned for its mild climate, and the model is now looking prematurely aged.

PAVEL DVOŘÁK'S 1971 WORLD CHAMPION A/2 KITED
Recently, I was fortunate enough to obtain, through the kindness of a Czechoslovakian friend, a kit for the model that won the 1971 World Championships at Save, Sweden. Pavel Dvořák's *Saper* (Saphire) is the tapered tip panel model with the flexible wing that stood him in such good stead in the fly-off; it spans 86in. and uses spruce mainspars arranged vertically and passing through the centre of the ribs. The spars are reinforced with steel wire of about 30swg which undoubtedly adds to the strength of the structure during catapult launches off the top of the tow. As far as I can recall this is the first World Championship winning glider that has ever been kited, and the Czechoslovak Igra company have certainly done a good job on it.

Retailing for 79 Koruna (about £5), it is by far the most complete kit I have seen. Construction has not yet started, but there seems to be absolutely everything in the box, apart from dope needed to complete the model. The photograph gives some idea of the contents, but these include such usually omitted 'extras' as steel shot for nose ballast, two grades of glasspaper, screws, pins, nylon for the auto rudder hook-up, thread for turbulators, nylon gauze for the rudder hinges, two types of glue (acetate cement and a powder which will probably turn out to be tissue paste), rubber strip, rivets and tissue like a medium weight Modelspan. Other points of interest include a pre-cut dural wing tongue, stamped brass parts for the tow-hook, and stout pre-cut dural templates for the tapered wing ribs. (Before you ask why not die-cut ones, just think of the effort to trim off the 'tatters' from most die-cut ribs, and compare this with the simple operation of sandwiching the right number of blanks between the end templates and then sanding them so as to produce 20 finished tapered ribs.) Wire for the spar reinforcement is included, as is a pre-sawn pine core for the nose of the aircraft. The plan is lucid and there are comprehensive instructions in Czech and English. Balsa is of reasonable quality, some of it pre-printed five-ply is included, and the spruce for spars is the crispest, truest such wood I have seen since stocking up on hardwood in a Helsinki model shop after the 1965 Championships at Kauhava.

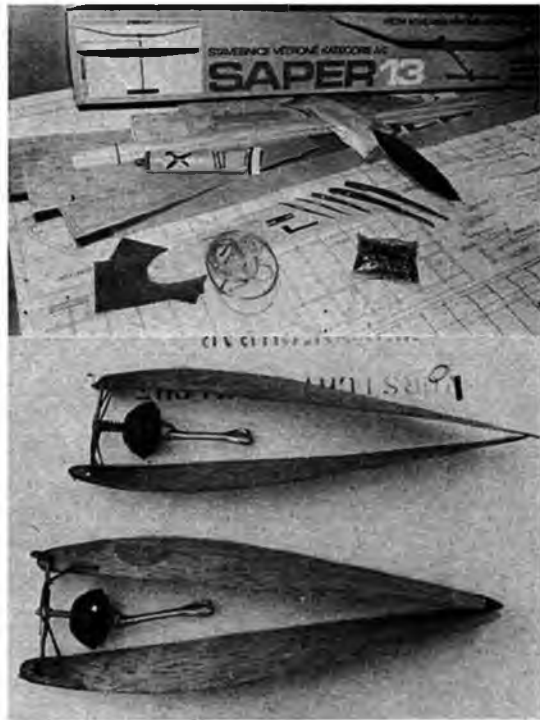
When time permits, I shall be reporting on building and flying the *Saper*; but meanwhile, if you have any Czech friends or are going there yourself, try to pick up a kit.

Mentioning the 1965 Kauhava contest reminds me that the Finnish offer to host the 1977 World F/f Champs on a frozen lake in March has been withdrawn, due partly to the difficulties that non-skiers might have in the three feet snow. There is however a possibility of a summer date in the same country. It would be interesting to see the difference in model performance compared with the Plovdiv Championships, with day temperatures of 35°C (100°F).

NFFS SUPPLIES

Among the specialised suppliers of free flight items is the prestigious *National Free Flight Society* in the United States. Their current list includes the following:

Glass fibre tallbooms, 42 x 0.46in, tapering to 0.29in approximately 30 grams. \$4.50 each.



Nylon tubing 0.032in. i.d., 0.1072in. o.d., 0.6 grams/ft., \$0.10 per foot.

Landing skids, 1/4in. music wire, 5 1/2in. long with two coils, \$0.50 each.

Carbon fibre in 1 metre tows (like string, 1/4 x 1/4in. approx.), \$0.40 each for 1-10; \$0.35 each for 11-20; \$0.30 each for 21 or more.

Heat shrinkable Mylar for covering, applied with thinned contact cement. Half mil. thick, clear, 40in. x 10ft., \$3.50; chrome 28in. x 6ft., \$2.00.

Machined aluminium propeller hubs, with shaft and hinge holes accurately drilled, in four sizes, all at \$1.05. Wake and Unlimited 2.12in. x 0.50in., 2mm shaft hole, weight 6.5 grammes. Tube type, as above but 1.75in. long, for use with 1.25in. motor tubes, weighing 6 grammes. Coupe, 1.62in. x 0.38in., 0.062in. shaft hole, weight 4.5 grammes. Oldtimer, 2.00in. x 0.38in., 0.062in. shaft hole, weight 5.5 grammes.

The address for the above and other free-flyers' delights is: NFFS Supplies, Joanne Meuser, 4200 Gregory Street, Oakland, CA 94619, USA. Postage and handling is 50c. for parcel post \$1.50 for first class.

Picture at top of page shows the Czechoslovakian kit of the 'Saper' A/2 glider, as designed by 1971 World Champion Pavel Dvořák. See accompanying text for details. Beneath that are close-up views of American Wakefield flyer Bob White's props, showing the different length cast stirrups used to make up motor lengths.



Left: Cuba fielded a full glider team at the Plovdiv World Champs, and Antonio Martínez was successful in reaching the fly-off.

LATEST ENGINE NEWS

by Peter Chinn

K&B Torpedo 35 'Series 64' (left) and its modern successor, the K&B 35 'Series 75'. Earlier model used lapped piston and ball-bearing shaft. New one has ringed piston and plain bearing.

Irvine to assemble K&B 35

An interesting piece of news to open the 1976 season is that K&B 35 'Series 75' engines for the UK market will, in future, be assembled in Britain by the UK distributor, *Irvine Engines* of High Barnet, Hertfordshire. To the best of our recollection, this is the first time that an American engine – or, for that matter, any model motor of overseas origin – has been assembled in the UK. The advantage of this move is that it should be possible, by the importation of parts in bulk, to hold the future price of the finished engine in this country a little below the figure that would otherwise be necessary.

The K&B 35 'Series 75' was introduced a few months ago and is an entirely new model in the K&B range. A plain bearing, crossflow scavenged engine, it can be regarded as a modern replacement for the earlier and cheaper K&B Stallion 35 motor although, in design and construction, it is actually more closely related to the twin ball-bearing K&B Torpedo 35 'Series 61' and 'Series 64' models from which the subsequent and more widely known Torpedo 40 range was developed.

It has, for example, the same type of main casting as the Torpedo models mentioned, comprising crankcase barrel and full-length finned cylinder casing, to which is fitted a drop-in



cylinder liner. This contrasts with the Stallion set-up of a unit crankcase and main bearing and a separate one-piece machined steel cylinder having integral cooling fins.

Unlike the Series 61 and 64 Torpedo 35s, which had lapped cast-iron pistons, the new 35 uses a Dykes-ringed aluminium piston like the Torpedo 40 models. The piston is machined from aluminium alloy bar stock with a straight deflector that is radiused on both the transfer and exhaust sides. The forged connecting-rod has a bronze bushed big-end and a plain small-end. A fully-floating 0.179in. o.d. gudgeon-pin with PTFE pads is fitted.

The crankshaft has a $\frac{1}{2}$ in. o.d. journal and a $\frac{3}{8}$ in. o.d. pressed-in

crankpin. Counterbalancing is by means of cutaways each side of the crankpin. The gas passage through the shaft is bored $\frac{1}{8}$ in. (8.7mm) and is fed from a $\frac{1}{2}$ in. long rectangular valve port that registers with an oval port in the bronze bushed main bearing. At the front end, beyond the bearing, the shaft is reduced to $\frac{3}{8}$ in. and is fitted with a steel split tapered collet on which is mounted an aluminium alloy prop driver. A separate $\frac{1}{4}$ in. prop stud is used.

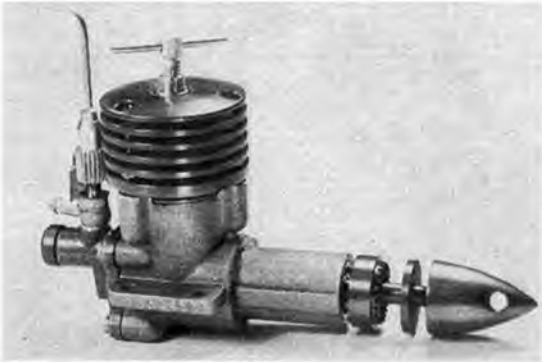
The cylinder liner is a close fit in the casting and has conventional porting comprising four transfer ports and five exhaust ports. The pressure diecast aluminium alloy cylinder head has what is basically a bowl-shaped combustion chamber

K&B 35 front end parts include removable venturi insert and prop stud.



K&B 35 crankcase, cylinder and piston assembly parts. Piston has Dykes ring and fully floating gudgeon-pin.





surrounded by a squish band, although the latter is, of course, divided by the slot necessary to clear the piston baffle at TDC. A K&B KB-IL glowplug is fitted.

The engine has a bore and stroke of 0.790in. x 0.720in., giving a swept volume of 0.3529cu.in. or 5.783cc. Checked weight of our sample was 257 grammes or 9.1oz.

As supplied, the K&B 35 Series 75 is fitted with a venturi insert of 0.265in. or 6.7mm i.d. After allowing for the spraybar, this gives a quite small effective choke area of just over 10sq.mm. to provide really strong fuel draw, such as would be required for satisfactory operation in controlline aerobatics. Removing the insert opens up the intake to .378in. (9.6mm) and the effective choke area to no less than 35sq.mm. In this form, of course, the engine requires the assistance of a pressurised fuel delivery system but very considerably more power is released.

For example, on 5% nitro fuel, we obtained readings of 10,100rpm on a 10 x 6 Top Flite maple, 11,000 on a 10 x 6 Taipan nylon-glassfibre, 11,700 on a 9 x 6 Top Flite maple and 12,400 on a 9 x 6 Taipan nylon-glassfibre, when running with the venturi insert in place, but these figures were increased by between 1200 and 1700rpm when the insert was removed.

A full test report with performance curves on this new K&B motor will be published in the *AeroModeller* Engine Test series in the near future.

Variable droppers again . . .

It was good to see control-line columnist Dave Clarkson recommending (*AeroModeller*, December issue) the use of a 'Variable dropper' with 2 volt glowplug accumulators. Why on earth more people do not use such a device is a puzzle. We have used one ever since the first model glowplugs (Ardens) came on the market — which is an awful long time

New Russian MK-17 rear-induction 1.467cc diesel. Similar to MK-16 model but more heavily built. When comparing MK-17 with previous MK-16 model, the crankshaft is the only major part to remain unaltered.



ago! In fact we are still using the same one — but not the same accumulator or plug clip! — that appeared ten years ago in ye olde beginners' booke *All About Model Aircraft*. The photo of it still appears in the current (fourth) reprint, so far as we know (we haven't yet seen a copy to check) somewhere in the chapter entitled 'More About Motors'. The device consists simply of a strip of fibre board wound with 5 amp fuse wire to provide the required resistance and mounted on one of the accumulator terminals. One plug lead is attached to the other accumulator terminal and the remaining lead to a crocodile clip which can be positioned on the resistance windings to give the required 'glow'.

The great thing about a variable resistance is that one can adjust it to the exact requirements of the plug. Contrary to popular belief, glowplugs are not precisely divided into '1.5 volt' and '2-volt' types. Quite a lot are 'in-betweens'. Another advantage is that one can also compensate for the difference in voltage available from a fully charged lead-acid cell, compared with the same cell when partially discharged but still usable.

The essential tool to go with the variable dropper is, of course, a decent box spanner for quickly and safely

removing and replacing the glowplug so that its 'glow' can be checked and the resistance adjusted to its requirements. Both Fox and O.S. offer excellent combination tools for this purpose.

Rossi R.15RV

In the December issue, the front induction Rossi R.15 diesel was briefly described. The other major variant of the R.15 introduced last year was the rear rotary-valve model, the R.15RV.

The ways in which this version differs from the shaft-valve models can be seen fairly clearly in the photographs. The substantial main casting is much the same except for the omission of the intake boss. The crankshaft main journal, no longer needing to accommodate a valve port and gas passage, is reduced from 10.5mm o.d. to 8mm and is supported in a suitable reduced size ball-bearing. The front end of the internally counterbalanced crankshaft is unchanged and continues to be carried in a 5mm ball-bearing. The 4.5mm dia. crankpin now has a 2.0mm spigot for the rotary-valve drive.

The valve rotor is of the counterbalanced disc type, 2.0mm thick and made of hardened and ground steel as pioneered by Super-Tigre and now

used by a number of other rear rotary disc valve motors. The disc is mounted on a 4mm steel pin locked into the cast aluminium backplate. On the outside of the backplate is a 9mm i.d. boss for the carburettor venturi. The latter, machined from aluminium alloy, has a 7mm i.d. choke instead of the 6mm choke of the standard front induction motor, increasing its area from 28.3sq.mm to 38.5sq.mm, but since it has a normal jet tube protruding into it, instead of peripheral surface jets, the actual effective choke is about 33 sq.mm.

The R.15RV is only slightly heavier than the shaft valve model. The engine examined scaled exactly 170 grammes or 6.00oz.

The R.15 *Normale* shaft-valve engine has twice been featured in the *A.M. Engine Tests* series and this is still the most popular of the R.15 series which now numbers six models: i.e., standard (free-flight) front and rear induction models, piped (C/L speed) front and rear induction models and diesel (combat and team-racing) front and rear induction models.

Russian MK-17

The latest Soviet-made engine to be offered in the UK by The Modellers Den Ltd is the MK-17. This has been developed from the MK-16, one of the better Russian motors, the prototype of which, then known as the MK-16K, was designed as long ago as 1954 by V. Petukov. TMD began importing the MK-16 in 1973 and a description of the engine appeared in the November L.E.N. column of that year.

Generally, the design, unusual for a 1.5cc diesel in its use of rear disc valve induction and twin ball bearings, is unaltered but there are

Rossi R.15RV. In general, this disc-valve model has not demonstrated any marked performance advantage over the well-established and outstandingly successful shaft-valve R.15.



Rossi R.15RV rear induction assembly uses steel valve disc and different intake assembly with slightly larger choke area.



numerous modifications to the component parts as the photographs indicate.

For example, a much heavier crankcase casting is now employed and calls for wider bearing and mounting bolt spacings. The engine's bore and stroke (12.8 x 11.4mm) are unchanged but a heavier cylinder with much thicker walls is used. The machined aluminium alloy finned cylinder jacket is also of considerably larger o.d. The cast-iron piston no longer has the three circumferential grooves of the MK-16. The rather modest 5mm dia. crankshaft, however, is retained and continues to run in two 8-ball brass-caged ball bearings.

The machined aluminium rotary-valve disc is also unchanged but is now mounted on a removable (instead of pressed-in) pin, in a new and larger backplate unit. The intake is an integral part of the backplate as before but now has a separate 5mm i.d. venturi insert.

The claimed peak power output for the unit is up from 0.14bhp at 14,000rpm, to 0.15bhp at 12,000rpm – this latter with the 5mm venturi insert in place. The engine's weight, as one would expect, is also increased although it is still quite reasonable for a rear-induction 1.5cc ball-bearing diesel. Our example checked out at 131g (4.6oz.).

Revised Rossi main casting and new 8mm o.d. shaft. Spinner/prop driver assembly unchanged.



Remaining Rossi R.15RV parts – i.e. piston and cylinder assemblies and special glowhead – are unchanged.



CLUB NEWS

TO MY MIND what model flying is all about is MODEL FLYING. However pleasant it may be to dream about models and talk about models, what makes a model flying club really tick is the number of people active on the flying field. In this respect some quite large clubs can be mere 'paper tigers' with the accent on the verbiage rather than the flying field herbiage, whilst the small club or group can log up quite a formidable flight tally. Not that the issue is always related to size, but there is nothing more depressing for club officials than administering to a lot of people who succeed only in keeping the flying field remarkably empty.

Often the most active type of club member is the competition flyer, particularly the one who appears to be here, there and everywhere, and there are many such enthusiasts in the subject of our first report, the Croydon & DMAC, even though PRO, M. L. Wood, speaks of a quiet year. The strongest club suit has been 'Indoor', with John Blount winning 1st in Open, 2nd in EZB and 3rd in FID, at the Indoor Nationals. He also succeeded in gaining a place in the Indoor team at the Trials. These 30 minute plus microfilms have to be seen to be believed – you can actually count the prop revs – and are a whole science unto themselves. In the more robust outdoor world, Ian Kaynes was first in Coupe D'Hiver at the Nationals, and got some useful placings in other F/F events throughout the year. The ubiquitous Martin Dilly took first in glider at the Southampton Gala and repeated the success at the London Area Gala. His high spot of the year was proxy flying his way into the World Champs glider fly-off on behalf of New Zealander, Rosalie Douglas (a case of libbing it up). Seen, too, around the contest areas, the tall, bearded figure of Dave Hipperson. He has been most active in Wakefield, where he got a 1st at the 5th Area SMAE event, and he also featured in the Open Rubber fly-off at the Nationals, gaining a useful fourth place. Other placings throughout the year by Pete Jellis, Don Thompson and Al Wisher.

The car situation may be a bit shaky up Leyland way, but the new model club, the Leyland MAC, appears to have its production lines running very smoothly, according to a report received from C. Snape the Secretary. Formed in April, 1975, it has a membership of 42, and is still growing. Members are fortunate in having three large flying fields, all next to each other, where they fly Radio, free flight and control line. After putting on a demonstration for the Recreation and Amenities Committee the club has been granted the use of a local park for a six month trial period. The club emblem is a large black bird, all beak and backbone. He is called 'Rocky', not because of any fundamental instability, but because he is based on the giant Rock in the Tales of the Arabian Nights. Interested? Then phone Chris Snape at Leyland 31966 after 7 pm.



Gainsborough MAC, on the broad acres of Lincolnshire, is another new club. It grew out of a meeting with R. Morns, now the Secretary, and another active model flyer in the area. It then became evident that there was a local

demand for a club, and soon there were regular flying meetings, mostly of a C/L nature. In one or two cases enthusiasm outstripped experience, such as the youngster who built a model out of 3/8 in plywood. It lumbered a bit, but with a few alterations it flew. What the club now requires is some good flat decking over which to operate the many scale models which are making their appearance. Rough and broken ground is obviously useless for such refined specimens, and the club has its eye on a large school playing field, and hope to get the chance to demonstrate the models before the school governors. Given a good field the club should well and truly establish itself in 1976.

The Feltham Club, which hails itself as London's foremost C/L club, wishes it to be known that it is neither Alcoholic nor Anonymous. The fact that, during the contest season, the club hearties take their lunch at whatever pub is local at the time, has scared a couple of new members into believing that there is more tanking up outside the field than on it. Let it be known, though, that the odd stagger or two comes from 'pilot vertigo' and not from over indulgence. If you still have doubts come along to meet the sober, but not sober sided, members at the Southville Youth Centre, Bedfont, 8.30 pm on Tuesdays. All types of C/L flying is catered for, but the emphasis is very much on competition flying. The breeding ground for the many flyers of international calibre has been the celebrated Hayes flying circuit nearby – a prime asset to the club. Seeking international honours after qualifying for the World Champs to be held at Utrecht are the well known teams of Steve Smith/Dave Fry and Richard King/Dave Rudd. And it is the Smith/Fry team that has put up the best all round show over the year, setting new records in Goodyear with a combo of Rossi and Miss San Bernardino. We are warned that they have a new model for '76. All in all the club hopes to field no less than 18 teams in the coming season. A sporty knockabout competition has been devised by the club, called '3 in 1'. Any type of C/L model, engine max 3.5cca) 10 laps Speed. b) Team Race. Most laps in 4 mins flying. c) Knock-Out Combat. Remember: only one model. Report from Dave Rudd.

Barry Halford of the Norwich Club reports a successful year for the East Anglia Area in the East Anglian News. On the free flight side several Area members have competed at International level, and although the clubs nearer to London have elected to fly at Bassingbourn there was a loyal turn out for the Area Gala at RAF Watton. C/L, too, has kept its end up extremely well, particularly in the Southern half of the Area, whilst Radio can look back on a number of successful fly-ins throughout the year. The three clubs which do all the F/F contest flying: Anglia, Norwich and Stanstead, feature in the Area Individual Championship Table, with A. Wells (Bob) coming out top, closely followed by his flying mate, R. Pavely. Third man is Barry Halford. In the *Plugge Cup*, for best overall club performance in SMAE events over the year, Anglia finished fourth and Norwich fifth – and that bespeaks a lot of high class flying in the Area. Writing under the Colchester section, someone says he came across an old 1949 model journal in which was described the splendid facilities available at Eaton Bray: 70 acres of aerodrome, camping, catering, special instructional camp with toilets, showers and model workshop. Not a dream, but all true, for which I can vouch, having spent a very enjoyable week at the camp when there was still such a thing as open space, and people actually travelled to model meetings by train!

I thought I had not seen any copies of the once familiar *Scimitar* from the Buckaneers Model Club knocking around lately, and from the two copies we now have to hand we learn that it is a case of the sword being mightier than the pen, or, in other words, there has been plenty doing on the flying field but not much in the way of contributions.

		MICHAEL'S MODELS 646-648 HIGH ROAD N. FINCHLEY LONDON N12 0NL				Racing, Sport & Vintage Engines NEW ENGINES IN STOCK	
COX ENGINE SPARES Cox Glow clip ... 39p Kavan '049 tank extender ... 50p '010 Glowheads ... 79p '020 Glowheads ... 79p '049 Glowheads ... 79p '15 Glowheads ... £1.30 '020 Needle Valve and spring ... 60p '049 Babebee Needle valve and spring ... 60p		T.D. '049 needle valve and spring ... 80p T.D. '049-'051 N.V. body and venturi ... £2.01 '020 Peewee overhaul kit ... 65p '049 Babebee overhaul kit ... 75p '010 T.D. Tank ass'y ... 95p '020 Peewee tank ass'y ... £1.95 '049 and '051 Muffler kit ... £1.65 Postage 10p		Rossi 15 RVD ... £43.50 Rossi 15 Combat diesel ... £39.50 MVVS D7 diesel ... £14.95 Rossi 15 Normale glow ... £36.50 Rossi 15 Normale R/V glow ... £39.50 Super Tigre G15 R/V diesel ... £26.44 Super Tigre G15/19 glow ... £21.43 Super Tigre G20/15 diesel ... £17.30 Super Tigre G15 Goodyear ... £21.43 PAW 2'49 diesel ... £7.56 PAW 19 DS diesel ... £8.10 Mabuchi aero motor kit ... £7.81 Zom 2'49 diesel ... £13.50		Mk17 1'49 D ... £6.80 Shokol 2'49 D ... £5.95 PAW 1'49 DS diesel ... £7.02 MVVS 2'49 Tuned ... £10.20 COX 010 TD ... £9.95 COX 020 Peewee ... £5.35 COX '049 TD ... £10.75 COX '051 TD ... £10.75 COX BLACK WIDOW '049 ... £6.95 COX '09 TD ... £11.75 COX MED '15 ... £14.50 Super Tigre 21/40 F.I. ... £25.11 Indian Mills '75 ... £7.95 Postage 25p per motor	
Closed all day Monday MAIL ORDER A PLEASURE All inquiries must be accompanied by ABE Phone Barclaycard, Access No. for same day service		Easy Parking Export Orders Welcomed PHONE 01-445 6531		We buy all types of engines for cash. Send for best quotation by return. Phone for stock position. Barclaycard, Access, phone number for same day service.			

The club had a busy season of it, with bags of flying time and many bookings for displays. Membership in this all types of model club is around the 130 mark. Brickhill is the flying site which they share with herds of cows and bullocks. Easy to slip up here, but a bit of careful steer-age can work wonders.

In these days of soaring costs, clubs like the Wolves MAC, find the revenue from demos a useful source of income. In the case of Wolves it equals that from subscriptions, and the club newsletter goes on to say that this is earned by about ten members, but the benefits are generally shared. Is there a problem here? At the Club Free Flight Gala, held back in September, the high spot was the Scale event. This attracted a nice tally of six entries, five of which flew. It was won by Ced Elliot with a *Flying Flea*. Not as pretty as the *Piper Cruiser* and the *Albatross* it was competing against, but it flew remarkably well, which is surprising since the tandem layout is by no means conventional.

Yet another dickie bird gracing the cover of a club magazine: this time the dreaded 'Fellside Falcon', the particular pet of the Penrith & D. Model Club. A lively little newsletter, if a bit thin in content. Exactly what a 'Fellside' is only a Dan Archer would know, but we do know the club is based in Cumbria, famous for its tarns and tourists. Most types of model flown in the club, and when the weather is really bad they take to the boats (model, of course).

Someone in the Wharfedale & D. club newsletter asks what has happened to all the sports flyers. The chaps who played endlessly with their Mills .75s? Seems the breed no longer exists — its either radio or nothing. Only people who walk nowadays are free flight fanatics and those who do it for charity. For those who like a bit of edge to their sport there was the Goodyear Marathon at Driffild back in October. A good turnout, with 35 separate entries. Won by Clarkson/Daly of Norwest with a record 1285 laps. Horton/Haworth of the home club were third.

The Leicester MAC, bulletin is full of booming activity as ever. It is encouraging to see so much evidence of free fighting in this large club — there is still much fascination in getting a model to climb, glide and land without any controlling agency. Moreover its cheap and free from restrictions. I notice that the club Junior Champion, Miss Della Player, has been competing very ably in the club glider events with her *Inchworm*. This young lady obviously finds the right sort of fascination in free fighting. But what of the future of F/F, or any other flying, if Wymeswold goes? It is due to change ownership in the new year, and all fingers are firmly crossed.

Clubman

Contest Calendar

- 7-8th February **NW AREA INDOOR MEET.** Saturday: Microfilm; Sunday: 'Eaves Silver Trophy' events - EZB, HLG, Keyhole Scale. Juniors up to age 15, over 12 must be builder of model. Soft footwear essential. Venue: YMCA Gym, Houghton Street, Southport. Details from P. Branigan (Farmby 74133).
- 7th March **NW AREA INDOOR MEET.** 'Eaves Silver Trophy' events as above. Venue to be announced.
- 1st August **FACCT THERMAL SOARING MEET.** Pre-entry 50p to N. Webb, The Bungalow, East Street, Fritwell, Oxon. Percentage/slot scoring system. Venue RAF Weston-on-the-Green, Nr. Bicester, Oxon.

Fireball GLOW PLUGS

You **NEED** plugs with different heat grades for different conditions. **STANDARD** for normal fuels and average conditions on most engines. In colder weather—or for faster starts any time—change to a **HOT** plug. For hot fuels and engines with high compression ratios, **COOL** is the choice.

FIREBALL GLOW PLUG insulators are colour coded for easy identification—**RED** for 'HOT'; **YELLOW** for 'STANDARD'; and **BLUE** for 'COOL'.

DISTRIBUTED BY RIPMAX MODELS

Recommended for ENYA, AUSTRO-WEBRA, FOX, HB, HP, MERCO, YAMADA, OS, and most other glow engines.

50p LONG & SHORT REACH



HOT
1.2-3v



STD
1.2-2v



COOL
1.2 or 1.5

AT YOUR MODEL SHOP



'Joy-Plane' BALSA CEMENT

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

Made by Modellers for Modellers.



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



BOEING F4B - 4

continued from page 73

A very attractive machine, and colourful too in its livery of yellow, grey and blue, this model is a crowd-puller wherever it appears. Tail-surface corrugations are easily duplicated by string doped in place - as detailed on the plan. At 45in. span, this model is nicely compact and will fit inside most cars despite being 'one piece'.

Three groups of three 12swg brass tubes bound and soldered together provide the guides, the upper and lower set being soldered to the outer legs and the centre set being soldered to the middle leg. A compression spring overcomes any reluctance to droop. The tail wheel leg can be made from $\frac{1}{8}$ in. aluminium and tin plate held together with two 10BA screws, and pivoted to the bracket with an 8BA screw. The remaining blocks can now be added to the front fuselage followed by the fairing for the U/C and cabane struts.

Construct the lower wings by cutting out ribs R1, R3 to 7 and main spar (assuming the R2s have been previously built in the jig as suggested). Slide ribs onto spar and glue in place, pinning the whole assembly down over the plan, packing up tip ribs as necessary. Notch $\frac{1}{8}$ in. x $\frac{1}{8}$ in. leading edge for ribs and glue in place, similarly the $\frac{1}{8}$ in. x $\frac{1}{8}$ in. trailing edge. The outer parts of the LE and TE are laminated from $\frac{1}{8}$ in. sheet to produce the large radius curve towards the tips. Start with the lamination that abuts the end of the ribs, and work outwards one lamination at a time, pinning and glueing generously as you go. Fill in between ribs with scrap pieces. Add $\frac{1}{8}$ in. sheet strut supports in between R1s, flush with top surface of wing. Clean up, add $\frac{1}{8}$ in. sheet tip, shape when dry and sand whole wing.

Construction of the upper wing is similar to lower wings except that there are three spars and the ribs are labelled 'W' to avoid confusion with the lower ribs 'R'. The LE is $\frac{1}{8}$ in. square, the TE is 1in. x $\frac{1}{8}$ in. and the strut supports are flush with the bottom surface of the wing. The spars are longer than 36in. and have to be scarf jointed as shown, and the trailing edge laminations are $\frac{1}{8}$ in. sheet.

Final assembly of the wings to the fuselage is commenced by glueing on the lower wings. The fuselage should be stood on the building board with its centre line level, and when the wings are assembled their tips should be 1in. higher than the root rib. The LEs are glued to the rear



face of F3. The TEs butt to each other with a $\frac{1}{8}$ in. square reinforcing strip between the root ribs and a slot needs to be cut in the wing to take the brace on F4. Before the glue sets, check for correct angle of incidence and alignment with tail.

The upper wing has to be slotted to take the cabane wires to the front and rear spars, to which they are securely bound and, when the incidence and alignment are satisfactory, epoxied in place. Make good the remains of the slots with scrap $\frac{1}{8}$ in. sheet. The 'under-belly' tank can now be built from $\frac{1}{8}$ in. and $\frac{1}{16}$ in. sheet as shown, and the various fillets made from a combination of soft block and Polyfilla.

Covering on the fuselage, fin and rudder etc. consists of generously overlapped pieces of lightweight tissue doped to the sanded structure. The wings and tailplane are covered with heavyweight tissue and given at least four coats of clear dope, as is the fuselage.

The imitation corrugations can now be added, by doping string to the tissue as shown. The interplane struts and dummy aileron links can now be lightly glued in place together with the pole aerial, tailplane struts and other scale details as required.

Finish and markings are very much the choice of the modeller as the Boeing comes from a very colourful era. The outlines of national insignia, large lettering and colour bands were painted with a ruling pen and ink compass, the remainder being filled in with a brush. Humbrol matt enamels were used throughout, while the fuel proofer used was Ripmax 'Tufkote' thinned with cellulose thinners and sprayed on lightly to achieve a matt finish.

Being a short nose aeroplane, the cowl may have to be packed with lead to get the balance point correct, but do not skimp on this as it could be fatal to take to the air tail-heavy.

S.E.S. MODELS

7 MARLBOROUGH PARADE
UXBRIDGE ROAD HILLINGDON
MIDDX. TEL. UX.30710

SES

MAIL ORDER SUPPLY

Our 25p. Catalogue contains:

R.S ELECTRICAL COMPONENTS • ENGINEERS TOOLS • DEVCON PRODUCTS •
ROCOL PRODUCTS • METAL & ACRYLIC SHEET, ROD & TUBE •
BADGER AIR BRUSHES • JAKAR DRAWING INSTRUMENTS •
GEORGE ROWNEY ARTISTS MATERIALS • LOCTITE PRODUCTS •
SOLARBO Balsa • AND LOTS MORE.

SEND FOR YOUR COPY NOW

AVICRAFT LTD., 6 Chatterton Road, Bromley, Kent
Telephone: 01-460 0818

Shop hours: Mon-Sat 10 am to 6 pm, Wed 10 am to 1 pm
Mail order any time

Rossi 15 FI Diesel £39.50, Rossi 15 FI Glow £36.50, RI Glow £39.50.
No. 2 Heads 85p each post 10p pkt. Supre Tigre G.15 FI £21.43 post 35p.
Needles 30p spray bar 98p plus postage. Vernonite dopes in stock - also
Coverite - see Dec. advert. Badger Airbrushes - 250 £4.40 post 50p or
Special Offer on 200 Brush £15 only - Compressor in stock £37.00, tyre
adaptors and 1/4in. pipe fitting for compressor £1.05, also air regulator for
propel etc. £3.24 post 10p. Airbrushing for Modellers £1.50 post 25p. Spiralux
Regulator for Badger £13.45 post 25p. Jenesco Fuel cut-off valve £3.75
post 10p. Cox Muffler Conv. Head £1.90 post 15p for 040, 051. Sullivan
Control Lines - 7 strand - 2 x 35ft. £1.68 post 22p; 2 x 60ft. £2.24 post 22p.
D.C. Control Line Handle 61p post 30p. Control Line Manual £1.50
post 30p. Klett safety driver 80p post 10p. K&B Glowplug S.R. and L.R. R/c
82p each, KB LR Stan. 50p each. Mercury type plug spanner 28p post 10p.
Tornado 6 x 4, 7 x 4 props 16p and 21p plus post. Fibreglass Wing Joining
Pack 90p post 30p. Nylon Tape 33p post 10p. Sullivan adjustable glowclips
48p post 10p. Playtrix 6v fuel pumps £5.75 post 30p. Kevan Tank ext. for Cox
049 60p p/pd. "This is Model Flying" by M. Dilly £3.40 post 30p.

RIPMAX '76 C/L FUEL TANKS



PRESSURE FED...

With forward-facing vent and filler pipes. Fuel delivery pipe offset to right. Rigidly constructed in tinplate with brass tube pipe-work and TESTED soldered joints throughout. Above all they're designed by a top control line modeller who knows what team racers need!

10cc PRESSURISED TANK — — 38p
20cc PRESSURISED TANK — — 45p
30cc PRESSURISED TANK — — 49p

and STANDARD...

Identical quality construction with conventional vertical filler and vent pipes. Fuel delivery pipe draws down to the last few drops in level flight-again ideal for team racers as well as sport and scale control liners. Made to last a lifetime- stay leak-free.

10cc STANDARD TANK — — 36p
20cc STANDARD TANK — — 43p
30cc STANDARD TANK — — 47p

Remember, there are THREE SIZES in each type (photo only shows two of each... and all six should be available ex stock.

AT YOUR MODEL SHOP!

3 CHANNEL RADIO CONTROL



from



SANWA

A HIGH QUALITY SYSTEM INCORPORATING MANY UNIQUE FEATURES TO ENSURE MAXIMUM PERFORMANCE AND RELIABILITY. AVAILABLE THROUGH YOUR IRVINE DEALER NOW!

- ★ Superbly styled transmitter
- ★ High power output
- ★ Special receiver circuits to ensure maximum range
- ★ Exceptionally fast, high power servos
- ★ Equipped for dry battery operation

£83.50 including 25% VAT
(2 channel version (£69.96))

If you would like to know more about the Sanwa range of R/C equipment send s.a.e. for technical brochure.

Distributed and Serviced by

IRVINE ENGINES

UNIT 8, ALSTON WORKS, ALSTON ROAD, HIGH BARNET, HERTS.

Tel: 01-440 0923



WORLD-WIDE MAIL ORDER SERVICE S. H. GRAINGER & Co.

108 CALDMORE ROAD, WALSALL, ENGLAND WS1 3RB

One mile from M6 Motorway (Exit No. 9)

Telephone: Walsall 23382



RADIO CONTROL

Futaba
MacGregor
Skyleader
Graupner
O.S. Propo
Horizon
Swan
Waltron
Remcon Kits

ENGINES

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

KITS

RipMax
KellKraft
Graupner
Toplite
Sterling
Goldberg
Schuco
Aviette
True Line

BOAT KITS

S.H.G. Marine
Aerokits
Graupner
Billings
Norstar
Veron
Micro D.B.
Model Avionics
E.D., etc.

ACCESSORIES

Micro Mold
X-Acto
Kavan
DEACS
Electric Motors
Chargers
Boat Fittings
Tanks
Wheels

MATERIALS

Balsa Wood
Marine Ply
Fibreglass
Solarfilm
Nylon
Paints
Adhesives
Rubbing Strip
Buoyancy Foam

Mail Order Catalogue 35p - Barclaycard - Access - Paybonds

SCOTLAND

EAST AND WEST

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

Authorised Skyleader Service Agents

DUNNS MODELS

26 GLASGOW ROAD
PAISLEY TEL. 041. 840.1381

29 SCOTT STREET
PERTH TEL. 0738 24540

The glue that modelmakers discovered for themselves -

Borden WOOD GLUE

Originally designed for DIY use, we had no idea that Borden WOOD GLUE would be so widely accepted by modelmakers for gluing balsa wood model aircraft.

But many modelmakers have discovered for themselves that Borden WOOD GLUE has all the properties they require. Fast setting with a short grab time, it can be sanded without pulling and has a high resistance to vibration and the shock of sudden impact.

Have YOU discovered Borden WOOD GLUE?

Now available in Handy (4½oz) and 1 Pint sizes from most model shops.



Borden (UK) Limited
North Baddesley,
Southampton, SO5 9ZB

NJM FOR RADIO CONTROL AIRCRAFT KITS & ACCESSORIES

PRICES INC. V.A.T. E & O.E.

New Keil Kraft SES4	£19.98	R/C BY MACGREGOR	
KK ELMIRA (Gilder)	£17.95	Single Channel	from £18.75
KK Super 60	£15.50	Digimac 2, Tx, Rx, Batt. box	£31.50
RipMax Spitfire 63"	£25.95	Digimac 3, Tx, Rx, Deacs	£60.50
RipMax Hustler 54"	£16.80	Digimac 4, Tx, Rx, Deacs	£73.00
KK Scorpion 46"	£15.50	Micro Servo MR12F	£13.00
Sterling Cirrus 87"	£7.95	Electric R/C Flying:	
RipMax Mini Trainer	£11.50	MFA flight pack	£23.92
Fokker DB 46"	£14.95	"Hummingbird"	£10.80
Cessna Skylane 54"	£15.68		
2 Volt 9 A/H Accumulator	£3.65	BOOKS:	
2 Volt Charger	£5.21	RM Propo Book	£1.75 p&p 28p
RM Push-on glow clip	99p	R/C Soaring	£2.25 p&p 45p
		Flying Scale Mod. VVW2	£3.00 p&p 30p

EASY CREDIT TERMS: PAYBONDS, BARCLAYCARD, ACCESS

Second-hand equipment bought and part-exchanged
Stamped Addressed Envelope With All Inquiries Please

NORWOOD JUNCTION MODELS LTD. Hours: 9.30-6.00
Early closing Wed. 1 p.m.
3 Orton Buildings, Portland Rd., London, S.E.25 Tel. 01-653 4943

SUPER Tigre

THE NAME THAT
STANDS FOR
SPEED & POWER



G.60 F.I. R/C £47.58

	Retail (inc. VAT)
Super Tigre Engines	
*G20/15D	£17.30
*G20/15 DR/C	£24.53
G20/15G	£17.30
G20/15GR/C	£24.53
*G15 F.I. w/spinner Goodyear	£21.43
*G15 F.I. R/C	£27.00
*G15 R.V.D.	£26.44
*G15/19 F.I. R/C	£27.00
*G15/19 F.I.	£21.43
*G20/23 Std.	£17.30
*G20/23 R/C	£24.53
*G15/19 CAR. ABC	£31.50
G21/29 F.I.	£24.81
G21/35 F.I. R/C	£30.01
*G21/35 F.I.	£24.81
*G21/35 F.I. R/C	£30.01
G21/40 F.I.	£25.11
G21/40 F.I. R/C	£30.83

G21/46 F.I. Std.	£25.93
G21/46 F.I. R/C	£31.63
ST. 35 Std.	£19.71
ST. 35 S R/C	£25.50
*ST. 60 R/C	£31.20
*G60 F.I. Bluehead ABC	£47.58
*G71 F.I. R/C	£47.58
*X15 RV Tuned	£29.92
X15 RV Normal	
*X40 RV Pylon	£31.35

Silencers	
S15, fits G20, 15, 19, 23	£4.71
S23, fits G21, 35, 40, 46	£5.06
S35 fits ST355, ST35C,	
ST35R/C	£5.06
S40, fits G40	£5.06
S56, fits ST51, 56, 60	£5.06
S71, fits G60 FI & RV & G71	£5.06

Glow plug standard	.65
Glow plug R/C	£1.26
Speed Glow Plug	.84
Needle valves, fit all sizes	.30
Needle valve and spray bar	.98
Pressure Nipple	.30
R/C car heat sink	£2.58
Exhaust extension (R/C car)	£1.60
Idle Needle Assy. MAG 111	£1.04
Fuel Inlet Section	£1.04

*Indicates from stock at Dec. 16th.

To Commonwealth Dealers,
Importers and Wholesalers—
We are the agreed suppliers for
engines and parts. Just drop us a
line for copies of our latest price
schedule & delivery position.



WORLD ENGINES LIMITED

97 TUDOR AVENUE, WATFORD, HERTS
PHONE WATFORD 42868

VISITORS BY APPOINTMENT ONLY. PLEASE
TRADE ENQUIRIES INVITED S.A.E. WITH ENQUIRIES. PLEASE

KINDLY MENTION 'AEROMODELLER' WHEN REPLYING TO ADVERTISEMENTS

MICRO-MOLD

Makers of MICRO-ACCESSORIES
Britain's premier range of aero fittings
and accessories



The perfect mate for the GYR FALCON is the HORIZON CHINDIT 2 Digital Propo Radio Control System.

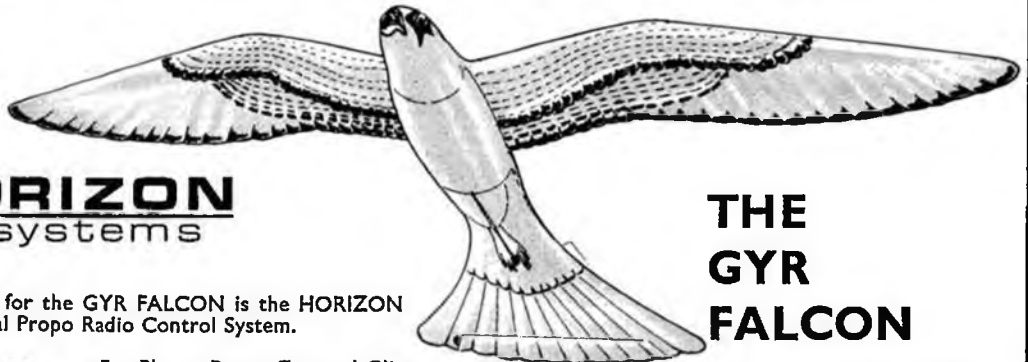


For Planes, Boats, Cars and Gliders. Airborne Weight 7oz. with 2 servos, for dry batteries (nicad for Rx available) dual axis stick, 12 months guarantee.

HS2LR/1 Chindit-2 with 1 servo
£39.65

HS2LR/2 Chindit-2 with 2 servos
£54.15

See Horizon R/C and the Gyr Falcon at your local dealer



THE GYR FALCON

An R/C Slope Soarer for 2 Ch. control. Span 50½ in., length 29½ in.

A really different model of lifelike appearance and scale size. No building—all in moulded foam—body and tail—head—plug in wing halves plus clear plastic fin/rudder. All linkages, accessories, adhesive and hardware—full assembly and flying instructions.

PRICE £13.30

Send S.A.E. to MICRO-MOLD for details of GYR FALCON and HORIZON R/C SYSTEMS.

MICRO-MOLD

1-2 UNIFAX WOODS WAY GORING-BY-SEA SUSSEX Tel: WORTHING 46999

dumas planes

SPECTRUM

A hot combat plane—120mph plus. Extremely manoeuvrable and competition proven. 42" wing span. Three shaped spruce booms, spruce leading edge doubler which allows engine to be recessed and a moulded plastic bubble for pacifier. £5.80



THE LITTLE TOMAHAWK

A perfect beginner's profile airplane. Extremely easy to build and really flies. Will do a complete stunt pattern. For .049 engine. £3.25



THE MUSTANG

Semi-scale U-control model of famous 'F-51'. Good stunt plane and a scale beauty! Span 48" area 408 sq. in. Recommended engine: .29. £14.60



THE SMOOTHIE

Bob Palmer's contest stunter for advanced aerobatics, windy weather. Wing span 52" area 501 sq. in. Recommended engine: .29 or .35. £13.60

THE TOM-TOM

Lightweight, low cost model for learners or sport. Easy to build. Wing span 40". Gives fine performance with .19 engine. £7.75



Available at your local IRVINE dealer

Distributed by

IRVINE ENGINES . UNIT 8 . ALSTON WORKS . ALSTON ROAD . HIGH BARNET . HERTS

Tel: 01 440 0923

KINDLY MENTION 'AEROMODELLER' WHEN REPLYING TO ADVERTISEMENTS

CLASSIFIED ADVERTISEMENTS

All classified Advertisements must be pre-paid.

Private and Trade rate 10p per word (minimum £1.00). Box Numbers 35p extra. Display box rate £2.00 per single column centimetre (min. £5.00, max. 5cm.).

Box replies to be sent care of Advertising Department, P.O. Box 35, Bridge Street, Hemel Hempstead, Herts, England HP1 1EE. All advertisements are inserted in the first available issue. There are no reimbursements for cancellations.

RIPMAX MODELS VACANCY

We are expanding our CUSTOMER RELATIONS DEPARTMENT and need a young modeller (16-19 years old) to work at our Enfield premises. Full training will be given so ability and willingness to learn are more important than experience. Position would suit person who likes modelling, enjoys meeting people, can write a reasonable letter and is not frightened of paperwork. Please write in the first instance giving details of yourself to:

The General Manager
RIPMAX MODELS
Green Street, Enfield EN3 7SJ

FOR SALE - TRADE

Electric Flight. Nickel cadmium cells, solder tags, top and bottom. 15 mins. recharge 1-2v, 1-2Ah, 50gm, £1.94 each. Generous discounts. Can supply 7 amp for over 11 mins. Diam. 22-6 x 43mm high. Many other sizes for dry cell replacement. Special 9v PP3 size £4.48. S.A.E. brings full details. Sandwell Plant Ltd, 1 Denholm Road, Sutton Coldfield, West Midlands. Tel: 021-354 9764. Add 25p P&P. T/C

Speed King F2A by Amato Prati for FA1. Lightweight fibreglass fuselage, magnesium alloy pan, formed aluminium foil wings, balsa tail, very complete specialist kit £18.25. Magnesium alloy pan, for free flight or control line £3.75. WORLD ENGINES, 97 Tudor Avenue, Watford, Herts. J

Spruce, obechi, mahogany strip. Large range of sizes in stock. 36in., 48in., 60in. lengths. SAE for list. Puncillio Model Spot, Waterloo Road, Hinckley, Leicestershire. T/C

FOR SALE - PRIVATE

Vintage engines, large selection, diesel, spark ignition, glow, Jetex. SAE for list. Box Number 966 (W. Midlands) AeroModeller Office, P.O. Box 35, Hemel Hempstead, Herts, HP1 1EE. J

Unused Gem 4 channel proportional R/C outfit, plus, Aircraft £80. Swenson, 59 Shrewsbury Road, Sale, Manchester. J

Selling up. Motors by Cox, Super Tigre, M.VV.S, Moki, Vintage Arden 199. Taton, Seelig Timers, Jap tissue, Pirelli, tachometer, electric starter. SAE please for lists. Kenward, 25 Grobars Avenue, Woking, Surrey. J

PERSONAL

Jane Scott for genuine friends. Introductions opposite sex with Sincerity and Thoughtfulness. Details free. Stamp to: Jane Scott, 3 Model North St, Quadrant, Brighton BN1 3GJ, Sussex. J-T

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

LOST

Lost. Q.D.M. 51145 1/4 V.H.T.L. model, red. Information to P.C. Bates, Cleethorpes Police, tel. 63825. J

BOOKS & PUBLICATIONS

Free Flight News - Subscription cost of £2.50 covers all 12 issues of 1976, from Ian Kaynes 2 Alexandra Close, Nettleby St, Farnborough, Hants. J

Cornish Gliding and Flying Club
Gliding courses in modern fleet from May - B.C.A. Fully rated Instructors - fine soaring - lovely coastal airfield - Ideal for a different family holiday

Details with pleasure from:

The Course Secretary
The Cornish Gliding and Flying Club
Travellas Airfield, Perranporth, Cornwall
Tel: Porthleven 294

Now You've Built A MODEL

Why not build a full-size aeroplane? Join the British Amateur Aircraft Industry, the POPULAR FLYING ASSOCIATION, and learn how to build your own flying machine. Read POPULAR FLYING, bi-monthly. Specimen copy 50p.

POPULAR FLYING ASSOCIATION
Terminal Building, Shoreham Airport
Shoreham-by-Sea, Sussex, England
Shoreham-by-Sea 61616

AeroModeller 80 copies 1951/68. Model Aviation 7 copies 1949/50. Offers to Barden, 80 Buller Road, Thornton Heath, Surrey. J

Model Aeroplane Gazette fullsize plans service. 'Big John' 63in. span, open rubber, contest, expert. £1.00 inc. p&p. 'Simple Knight' 42in. span, open rubber, contest, beginner. 90p inc. p&p. 'Mayfly' 52in. span, A/I Glider, contest. 75p incl. p&p. Or all 3 for £2.50 incl. p&p. By return service. M.A.G. 22 Slayleigh Ave., Sheffield S10 3RB. IJK

Plans enlarged or reduced and additional copies made. Send for details from Causser & Co., 216 Goldhawk Road, London W12. Tel: 01-749 3441. T/C

'Sailplane and Gliding' - the only authoritative British magazine devoted solely to the sport of gliding and soaring. 48 pages of fascinating material and pictures. Published every other month. Send £3 (or \$8) for a year's subscription to: British Gliding Association, Kimberley House, Vaughan Way, Leicester, England. T/C

WINCHES. THERMAL SOARERS. Why pay high prices for hand held glider winches? We can supply an 8:1 gear box, plus detailed instructions and drawings for only £2.75, or complete winches £5.29, plus 42p post.

EYNHALLOW AVIONICS, The Purlieu, Upper Colwall, Malvern, Worcs.

Why not tie a TITAN on the other end? Write for details of this contest winning kit.

ELECTRIC R.T.P.

A wide range of specialist supplies available by return of post. Stocks include a selection of 12 volt D.C. motors (including geared and extended shaft models) supplied complete with matched prop.

Pole contact head as kit of parts or assembled and wired, plans, kits cable, gear kits, ball races, oilite bearings, etc.

10p in stamps please for information sheet and full descriptive price and stock list.

HARRY BUTLER (Models)
Colchester Road, St. Osyth,
Essex CO16 8HB

Tel: 0255 820504 Trade inquiries invited

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.

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

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.

STUDLEY MODELS

Visit us for a friendly chat and all the advice you require. We stock: Futaba, MacGregor, Cougar, Enya, OS, Fox, Merco, Super Tigre, Micro Mold, CAP plans and kits, DB kits, Veron, Kell Kraft, Trueline and ready-to-fly aircraft.

B. T. WILLIAMS MODEL SHOP
39a Alcester Road, Studley,
Warwickshire

For further information ring Studley 3002
Barclaycard, Access and HP facilities

FLY YOUR MODELS OFF THE MOST SOUTHERLY POINT IN DEVON,

slopes for almost all wind directions in walking distance. Luxury self cater accommodation sleeps 2-12 at Prawle.

Telephone: Alton 62711 (Hants)

PEANUT SCALE KITS

COMPER SWIFT LUTON MINOR
Complete kits, including selected printed balsa, coloured tissue, plastic propeller and wheels, and fully detailed plan. Kits £1.25 each (postfree in UK). Plans plus instructions available separately, 40p each, or 70p for both (post free).

ANDREW MOORHOUSE
2 Cavendish Place, Bath

AeroModeller back issue mart, vast stocks of back issues held in stock. Baumont, 11 Bath Street, London EC1. alt/T/C

HOLIDAYS

Gliding holidays at Cambridge University Gliding Club for beginners and others. Details from Course Secretary, 54 Brampton Road, Cambridge CB1 3HL. jkl

WANTED - PRIVATE

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

Vintage ignition diesel and multi-cylinder engines wanted for cash. Tel: Godalming 21425. F-Q

Will swap Spark Ignition, early motors, many rare for early magazines. Ivor F. Box 11, Doonside. 2767 NSW. FHJ

Multicylinders MVVS, AeroModeller annuals wanted. Have new equipment, Thomas Chua, Box 1025, Kotakinabalu, Malaysia. E-J

Why not try a Gliding Holiday this year?

Accommodation in a village inn and instruction by professionals at our lovely site in the Cotswolds. Bring your camera and record the holiday of a lifetime.

Write to: The Holiday Manager
Bristol & Glos Gliding Club
Nymphsfield, Stonehouse, Glos
GL10 3TX. Uley 342.

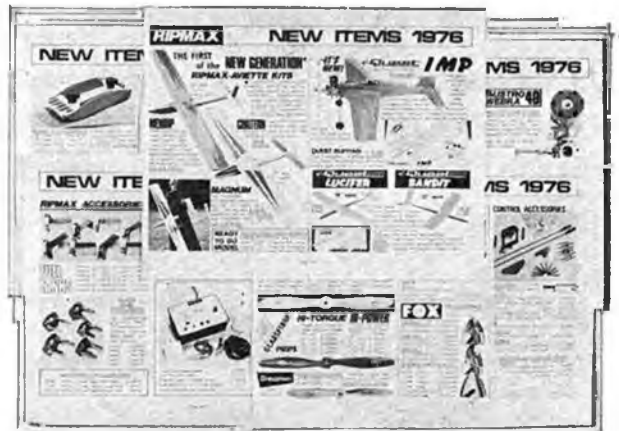
BIG VALUE

...in the 1976 RIPMAX MODELLERS HANDBOOK

with 16 COMPLETELY NEW PAGES

describing and illustrating the HUNDREDS of new items in the RIPMAX range for '76-electric flight, new kits, new engines, new accessories, etc, and a completely revised price list for ALL items. Wonderful value for a complete reference for modellers with dozens of factual articles, selection charts, data, etc, etc (not just a catalogue!)

NOW 196 PAGES! AND NO PRICE INCREASE!



Just some of the 500 new 1976 items!

95p AT YOUR MODEL SHOP

or £1.35 post paid direct from RIPMAX LIMITED,
RIPMAX CORNER, GREEN STREET, ENFIELD,
MIDDLESEX if you have no model shop near you.

VINTAGE FLYING SCALE PLANS

1935 Megows 12/15" Waco, Aeronca, Tipsy, Douglas 0-43, Vought V-100, Curtiss Falcon, Fokker DR 1, Fairchild 45, Polish Fighter, Lockheed Vega, BA Eagle, ME 29, 20p each. All 12, £1.50. (US \$5.00) (Aus/NZ £2.00).

1939 Aer-o-Kits 15" Master, Battle, Skua, Spitfire, Moth Minor, Harvard, Fury, Cygnet, Wellesley, Vildebeest. Plan, printed wood for ribs and formers. 8 page instructions. 40p each. All 10, £3.00. (US \$8.50) (Aus/NZ £4.00). Add 10p to all UK orders for postage. Foreign prices include airmail postage. Many others, including Henry Struck's 'Trailblazers' from 'Flying Aces' 1937/39 at prices from 15p to 30p. Illustrated lists of over 60 drawings 10p or International Reply Coupon. Order now for winter fun.

C. TISSIMAN

8 Graystones Grange Crescent
SHEFFIELD S11 7JL

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.

**PAY THE POSTMAN C.O.D. -
IT MAKES GOOD SENSE**

Newsletters and all lists sent for 20p in stamps

ROLAND SCOTT LTD.,

28 East Lanes Road, Swinton, Worsley
Phone: 061-790 6707

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 that race enthusiast, modeller and historian could desire. The Golden Era is recreated on large, crisply-printed 8 1/4 x 11" pages covering over 90 aircraft.

BEAUMONT

AVIATION LITERATURE

656 Holloway Road,
London N19 3PD

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,
656 Holloway Road,
London N19 3PD**

Charge per volume (including index) AeroModeller, Model Boats, Model Railways, Military Modelling, scale Models, Model Engineer - £3.50 plus p.p.

MICRO-X INDOOR SUPPLIES

Amazing quality Balsa (from .008"), Pirelli, Wire, Bearings, Condenser Tissue, Cement, Microfilm, EZB Kits, genuine Jap Tissue, Winders etc., all you need including expert advice.

Send medium SAE and 25p for list and 1976 catalogue.

Laurie Barr

4 Hastings Close, Bray, Berks.

BOB'S MODELS (BATLEY)

FEW ONLY. AMERICAN 1/4A POWER KITS

By Sal Taibl.

Orbiteer. Sal's latest	£6.00
Starduster X Hi Thrust	£5.00
Starduster 350 Hi Thrust	£5.50
Cox T.D. 049	£10.90
Sparo T.D. 049 Glow Head	.75
Spare T.D. Mk II 15 Glow head	£1.15
Towmaster Lightweight glider winch	£3.80

ALL PRICES INC. P. & P.

Access & Barclaycard welcome. Phone in your card number for despatch same day.

Easy Parking Open 9 a.m.-6 p.m.
Half day Tues 1 p.m. Late nights Fri & Sat 7 p.m.

4 Oxford St., Mount Pleasant,
Batley, West Yorks.
Tel. (STD 0924) 479300

PLEASE NOTE NEW TELEPHONE NUMBER!!!

PRICES QUOTED ARE THOSE PREVAILING AT PRESS DATE AND ARE SUBJECT TO ALTERATION DUE TO ECONOMIC CONDITIONS

SHOP GUIDE

READERS PLEASE NOTE:

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

★Mail Order Welcome

DEALERS —

get your shop on the MAP guide for only £3 a month — telephone Hemel Hempstead 55499 NOW

MODELLERS —

buy with confidence from these well-stocked shops

AUSTRALIA

MELBOURNE 3000 Tel. 347 8029
RIVERSIDE HOBBY CENTRE ★
16 LITTLE LATROBE STREET
9am–5.30pm Mon.–Fri. 9am–12 noon Sat.

AUSTRALIA Tel. 497087
SEMAPHORE HOBBY CENTRE ★
44 HART STREET, SEMAPHORE SOUTH
S. AUSTRALIA 5019

AVON

BEDMINSTER Tel. 662544
BEV'S MODELS ★
35 WEST STREET
10am–6pm. Late night Fri. 7pm

BRISTOL Tel. 557764
JIM BENNETT MODELS ★
351 CHURCH ROAD, ST. GEORGE
9.15am–6pm. Closed Wed.

BRISTOL 1 Tel. 23744
MODELLERS DEN
65 FAIRFAX STREET
Open 9am–5.30pm Mon.–Sat.

BRISTOL
TERRY'S
44 STATION ROAD, YATE
9am–5.30pm Mon.–Fri. 9am–6pm Sat.
Half day Wed.

BEDFORDSHIRE

LUTON Tel. 23182
AEROMODELS (LUTON) LTD.
20 GORDON STREET
Open 9am–5.30pm. Closed Wed.

LUTON Tel. 28435
MAPLE MODELS ★
16 MAPLE ROAD
9.30am–6.30pm. Lunch 1.30pm–2.30pm
Closed Tues.

BERKSHIRE

READING Tel. 477122
CHILTERN SPORTS SUPPLIES ★
16 CHURCH STREET
Open 9.30am–5.30pm. Half day Wed.
Closed lunch 1pm–2pm Mon.–Fri.

READING Tel. 51558
READING MODELS
5 CHATHAM STREET
9am–5.30pm each weekday

READING Tel. 50074
G. SLEEP LTD. ★
22–24 KING'S ROAD
Open 9am–5.30pm. 9am–4.30pm Wed.

BUCKINGHAM

AYLESBURY Tel. 85752
TAYLOR & McKENNA LTD.
46 FRIARS SQUARE
Mon.–Thurs. 9am–5.30pm. Fri.–Sat. 9am–6pm

BLETCHLEY Tel. MILTON KEYNES 70478
TAYLOR & McKENNA LTD.
16 THE CONCOURSE, BRUNELL CENTRE
Mon.–Thurs. 9am–5.30pm. Fri.–Sat. 9am–6pm
Half day Wed.

WOLVERTON Tel. 313142
LAKE BROS. ★
28 STRATFORD ROAD, MILTON KEYNES
Open 8.30am–6pm Mon.–Sat. Half day Wed.

CAMBRIDGESHIRE

CAMBRIDGE Tel. 59620
MODEL MANIA ★
17 KING STREET
9am–5.30pm Tues.–Sat. Closed Mondays

CHESHIRE

MACCLESFIELD Tel. 29467
HOBBYCRAFTS (MACCLESFIELD) LTD ★
PARK MILL, HOBSON STREET
Open 9.30am–5.30pm every day except Sunday

CLEVELAND

MIDDLESBROUGH Tel. 47889
THE MODEL CENTRE ★
17 CLEVELAND SQ., CLEVELAND CENTRE
9.30am–5.30pm Mon.–Sat.
Early closing Wed. 1.30pm

MIDDLESBROUGH Tel. 211212
MODELDROME ★
265 LINTHORPE ROAD
9.30am–6pm. Closed Wed.

CORNWALL

TRURO
COUNTY MODELS ★
THE CREATION CENTRE, BACKQUAY
Open 9am–5.30pm. Half day Thurs.

DEVON

EXETER Tel. 0392 58417
EXETER MODEL CENTRE ★
48 COWICK STREET, ST. THOMAS
Open 9.30am–5.30pm. Half day Wed.

EXETER Tel. 76935
EXETER RADIO CONTROL ★
35 SOUTH STREET
Open 9am–6pm all week

PLYMOUTH Tel. 0752 21851
PLYMOUTH MODEL CENTRE ★
11 OLD TOWN STREET
9am–5.30pm Mon.–Sat.

TORBAY Tel. 521767
MANSEL'S MODELS ★
PALACE AVENUE, PAIGNTON
Open 9.15am-5.30pm Mon.-Sat. inclusive
Half day Wed.

SOUTHAMPTON Tel. 25919
HOBBY LOBBY LTD. ★
52 COMMERCIAL ROAD
Open 9.30am-5.30pm Mon.-Fri.
Sat. 9.30am-5pm

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

TORQUAY Tel. 27764
TORBAY MODEL SUPPLIES LTD. ★
59 VICTORIA ROAD, ELLACOMBE
Open 9.15am-12.45pm and 2.15pm-5.45pm
Half day Wed.

SOUTHAMPTON Tel. 29223
SOLENT MODELS LTD. ★
60 OXFORD STREET SO1 1DL
Open Mon-Sat 9.30am-6pm
Fri. 9.30am-7.30pm

NEW ASH GREEN Tel. 0474 872136
THE HOBBY HOUSE
10 UPPER STREET NORTH
Open 9am-5.30pm. Closed Mon.

DORSET

BOURNEMOUTH Tel. 763480
WESTBOURNE MODEL CENTRE
59 SEAMOOR ROAD, WESTBOURNE
9am-5.30pm Mon., Tues., Thurs., Sat.
9am-7.30pm Fri. Closed Wed.

HEREFORDSHIRE

HEREFORD Tel. (0432) 4152
FRED PERKINS LTD. ★
48c COMMERCIAL ROAD
Open 9am-5.30pm. Half day Thurs.

SWANLEY Tel. 67457
SWANLEY MODEL CENTRE ★
(Formerly H & J Electronics)
39 HIGH STREET
Open 9.30am-6pm. Half day Wed.

POOLE Tel. 3300
SETCHFIELDS ★
21-25 HIGH STREET
Open 9am-5.30pm, 6 days

HERTFORDSHIRE

HATFIELD Tel. 63404
DESIGN AND HOBBIES ★
5 MANOR PARADE
Open 9.30am-6.30pm (Thurs. 7.30pm)
Half day Wed.

TUNBRIDGE WELLS Tel. 36689
E. M. MODELS ★
42 CAMDEN ROAD
Mon.-Sat. 9am-5.30pm. Closed Wed.

ESSEX

WICKFORD Tel. (037 44) 2621
WICKFORD MODEL EXCHANGE ★
ST. PETERS TERRACE, LONDON ROAD
Open 9am-7pm Mon., Thurs., Fri., Sat.
10am-1pm Sun.

HEMEL HEMPSTEAD Tel. 53691
TAYLOR & McKENNA LTD.
203 MARLOWES
Mon.-Thurs. 9am-5.30pm, Fri.-Sat. 9am-6pm

LANCASHIRE

BLACKPOOL Tel. 24901
D.G. MODELS ★
109 CENTRAL DRIVE
Open 9am-6pm weekdays
10.30am-4.30pm Sun.

HAMPSHIRE

ANDOVER
J. M. MODELS
7 SWAN COURT, EAST STREET
Open 9am-5.30pm. Half day Wed.

POTTERS BAR Tel. 59355
HENRY J. NICHOLLS & SON LTD.
8 SOUTHGATE ROAD
9.30am-6pm. Closed all day Thurs.
Fri. 9.30am-8pm

BOLTON Tel. 0204 74688
JOYCRRAFT ★
MOSES GATE, 58 STARCLIFFE STREET
9am-6.30pm. Wed. half day

ANDOVER Tel. 61307
RADIO CONTROL SUPPLIES ★
1a UNION STREET
Open 9am-6pm. Fri. 9am-8pm

ST. ALBANS Tel. 53954
S A M S
12 HATFIELD ROAD
9.30am-6pm Tues. to Sat. Closed all day Mon.

BURNLEY Tel. 23983
A.D. MODEL SUPPLIES ★
22 PLUMBE STREET
10am-6pm Mon.-Fri. Sat. 9am-5.30pm

FAREHAM Tel. 4136
G. M. H. BUNCE & CO. LTD. ★
206 WEST STREET
Open 9am-5.30pm. Closed Wed.

HONG KONG

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

LEIGH Tel. 71347
LEIGH HOBBY CENTRE ★
78 BRADSHAWGATE
9am-5.30pm Mon.-Sat., Wed. 9am-12.30pm

PORTSMOUTH Tel. 25049
RAY BROWN MODELS ★
10 KINGSTON ROAD
Mon. 9am-6pm, Tues. 10am-5.30pm,
Thurs. 10am-6pm, Fri. 9am-6pm,
Sat. 9am-5.30pm. Lunch 1.30pm-2.30pm

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

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

SOUTHAMPTON Tel. 7849
EASTLEIGH MODEL CENTRE
44b MARKET STREET, EASTLEIGH
Open 9am-6pm. Half day Wed.

KENT

BROMLEY Tel. 01-460 0818
AVICRAFT LTD. ★
6 CHATTERTON ROAD
10am-6pm (not closed for lunch) except
Wed. 10am-1pm

MANCHESTER Tel. 061-794-4064
LISTERS MODEL SUPPLIES
285 EAST LANCASHIRE ROAD, SWINTON
Closed all day Wed. Open Sun. 10.30am-1pm

MANCHESTER Tel. 061-794-1949/793-8078
ROLAND SCOTT LTD. ★
28 EAST LANCS ROAD, WORSLEY
Open 9am-6pm Mon.-Sat. Closed Wed.

WIGAN Tel. 45683
G. FORSHAW & SON ★
58 MARKET STREET
Open 9.15am-5.45pm Early Closing Wed.

LEICESTERSHIRE

HINCKLEY Tel. 30952
PUNCIILIO MODEL SPOT ★
6 WATERLOO ROAD
Open: Mon 9.15am-7pm Tues. 2pm-7pm Wed.
& Thurs. 5.30pm-7pm Fri. 9.15am-7pm Sat.
9.15am-5pm

LEICESTER Tel. 21935
RADIO CONTROL SUPPLIES ★
52a LONDON ROAD
Open 9am-6pm. Fri. 9am-8pm

LINCOLNSHIRE

LINCOLN Tel. 25907
MODEL CENTRE ★
24 NEWLAND
10am-5.30pm. Closed all day Wed.

STAMFORD Tel. 4524
SPORTS & HOBBIES ★
4 ALL SAINTS STREET
Open 9am-5.30pm. Half day Thurs.

LONDON NORTH

CAMDEN TOWN Tel. 01-485 1818
AERONAUTICAL MODELS ★
39 PARKWAY, NW1
9.15am-5.30pm Tues.-Fri. 9.15am-5pm Sat.
Closed all day Mon.

LONDON Tel. 01-607 4272
HENRY J. NICHOLLS & SON LTD. ★
308 HOLLOWAY ROAD, N7
Monday to Friday 9am-6pm
Saturday 9am-5.30pm

NORTH FINCHLEY Tel. 01-445 6531
MICHAEL'S MODELS ★
646-648 HIGH ROAD, N12
Open 9am-6pm. Closed all day Mon.

LONDON SOUTH

ELTHAM Tel. 01-850 4324
ELTHAM MODELS ★
54 WELL HALL ROAD SE9
Mon.-Sat. 10am-5.30pm. Closed Thurs.

LEWISHAM Tel. 01-852 2637
LEWISHAM MODEL CENTRE ★
45 LEE HIGH ROAD, SE13
Thurs. early closing. Fri. 7pm
Mon., Tues., Wed., Sat. 6pm

LONDON Tel. 01-228 6319
E. F. RUSS ★
101 BATTERSEA RISE, SW11
Open Fri till 7pm. Other days 9am-6pm. Early
closing Wed. 1pm

LONDON EAST

PLAISTOW Tel. 01-472 2471
A. G. HERMITE ★
633 BARKING ROAD, E13
Open 9am-6pm. Closed all day Thurs.

MIDDLESEX

HARLINGTON Tel. 01-897 2326
RADIO CONTROL MODEL CENTRE ★
214 HIGH STREET
Mon., Tues., Thurs., Sat., 9am-6.30pm
Fri. 9am-8.30pm. Wed. closed all day

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

KENTON Tel. 01-204 9867
HOBBIES AND MODELS
217/219 STREATFIELD ROAD
QUEENSBURY CIRCLE
Open 9am-6pm. Thurs. 9am-8pm
Closed all day Wed.

NORFOLK

KING'S LYNN Tel. 63164
BARNEY'S MODEL SHOP ★
SOUTH EVERARD STREET
Open 9am-6pm

NORWICH Tel. 618023
GALAXY MODELS ★
107 WADDINGTON STREET
Closed Mon. Tues.-Thurs. 10am-6.30pm
Fri. 10am-8pm, Sat. 9am-6pm

NORTHANTS

NORTHAMPTON Tel. 31223
THE MODEL SHOP ★
230 WELLINGBOROUGH ROAD
Open 9am-6pm. Half day Thurs.

NORTHAMPTON Tel. 27226
TAYLOR & MCKENNA LTD.
41-43 PRINCES WALK
GROSVENOR CENTRE
Mon.-Thurs. 9am-5.30pm. Fri.-Sat. 9am-6pm

NORTHUMBERLAND

NEWCASTLE UPON TYNE Tel. 22016
THE MODEL SHOP ★
18 BLENHEIM STREET
Mon.-Fri. 9am-5.30pm. Sat. 9am-6pm
Closed Wed. all day

NOTTINGHAMSHIRE

NOTTINGHAM Tel. 50273
GEE DEE MODELS LTD. ★
40 GOOSE GATE
Open 9.30am-5.30pm. Early closing Thurs.

WORKSOP Tel. 2855
RUSSELL MODELS ★
MODEL CENTRE, RYTON STREET
Closed all day Thursday

OXFORDSHIRE

ABINGDON Tel. 21927
F. KNIGHT & SON ★
44 BATH STREET
Open 8.30am-1pm/2pm-5.30 pm. Late night
Fri 6pm. Closed all day Thurs.

COWLEY Tel: Oxford 775239
DUNCOL KITES & AERO HOBBIES
78 HOLLOW WAY
Open 9am-5.30pm Mon-Fri, 9am-6pm Sat.
Closed Wednesday

OXFORD Tel. 42407
HOWES MODEL SHOP ★
9-10 BROAD STREET
Open 8.45am-5.30pm. 6 day week

SCOTLAND

GLASGOW
CROCKET THE IRONMONGER LTD. ★
136 WEST NILE STREET
Open 9am-5.30pm. 6 day week

GLASGOW Tel: 041-221 3870
FRASERS
BUCHANAN STREET
Opening hours - Mon, Tues, Wed, Fri, Sat
9am-5.30pm. Late opening - Thurs 9am-7pm

GLASGOW Tel. 041-632 8326
RIDDELL BROS. ★
61 MOUNT ANNAN DRIVE
Open 9am-6pm. Half day Tues.

SOMERSET

BRIDGWATER Tel. 3632
R.M. TOYS AND MODELS ★
36 ST. JOHN STREET
Open 9am-5.30pm. Half day Thurs.

STAFFORDSHIRE

BURTON-ON-TRENT Tel. 64240
J. & N. MODELS ★
 22 DERBY STREET
 Open 9am-5.30pm. Closed Wed.

STAFFORD Tel. 3420
JOHN W. BAGNALL LTD. ★
 18 SALTER STREET
 9am-5.30pm. Closed all day Wed.

STOKE-ON-TRENT Tel. 263574
JOHN W. BAGNALL LTD. ★
 30 PICCADILLY, HANLEY
 9am-5.30pm. Closed all day Thurs.

STOKE-ON-TRENT Tel. 85856
PLEASURE TREASURES LTD. ★
 4 SWAN SQUARE, BURSLEM
 9.30am-6pm. Half day Thurs.

WALSALL Tel. 23984
AEROMODEL'S (WALSALL) ★
 123 WOLVERHAMPTON STREET
 9am-5.30pm (6pm Fri.-Sat.). Half day Thurs.

WOLVERHAMPTON Tel. 26709
WOLVERHAMPTON MODELS & HOBBIES ★
 BELL ST., MANDERS CENTRE
 9am-5.30pm Mon.-Sat. Early Closing Thursday

SUFFOLK

IPSWICH Tel. 51195
BOWMANS OF IPSWICH ★
 37/39 UPPER ORWELL STREET
 Open 9am-5.30pm Mon.-Sat.
 Early closing Wed.

IPSWICH Tel. 57106
R. & D. MODELS LTD. ★
 25 NORWICH ROAD
 9am-1.30pm, 2.30pm-5.30pm. Half day Wed.

SURREY

ADDLESTONE Tel. Weybridge 45440
ADDLESTONE MODELS LTD. ★
 63 STATION ROAD
 Open 9am-6pm. Half day Wed.
 Lunch 12 noon-1pm Late night Fri. 6.30pm

KINGSTON on THAMES Tel. 01-546 4488
MICK CHARLES MODELS ★
 180 LONDON ROAD
 Mon., Tues., Thurs., 9.30am-6.30pm
 Wed. 9.30am-1pm, Fri., Sat. 9.30am-9pm

SUSSEX

BRIGHTON Tel. 418225
HARRY BROOKS ★
 15 VICTORIA ROAD, PORTSLADE
 Open every day except Sun. 8.30am-5.45pm
 (no half day)

CHICHESTER Tel. 83592
PLANET MODELS & HANDICRAFTS ★
 108 THE HORNET
 Open 9am-1pm and 2pm-6pm. Closed Thurs.

HORSHAM Tel. 61533
MODEL CORNER ★
 30 NORTH STREET
 Open 9am-5.30pm Mon.-Sat. Closed Thursday
 afternoons

WORTHING Tel. 207525
SUSSEX MODEL CENTRE ★
 10 TEVILLE GATE
 9am-6pm. Fri. till 7pm. Half day Wed.

WALES

CARDIFF Tel. 29065
BUD MORGAN ★
 22 CASTLE ARCADE
 SOUTH GLAMORGAN CF1 2BW
 Open 9am-5.30pm. Half day Wed.

CARDIFF Tel. 31367
RYALL & WALTERS RADIO MODELS ★
 34 LLANDAFF ROAD
 Open 9am-12.30pm/1.30pm-5.30pm Monday
 8pm. Closed Wed.

CWMBRAN Tel. 66727
THE HOBBIES SHOP ★
 32 THE PARADE (on the balcony), GWENT
 9.30am-5.30pm. Half day Wed.
 Open late Fri., 7pm

FLINT Tel: 3123
FLINT MODELS ★
 5-9 CHURCH STREET
 Open six days 9-5.30. Half day Wed.

NEWPORT Tel. Newport 65061
MODELS & HOBBIES ★
 (J. & J. W. MARTIN & SON)
 112 COMMERCIAL STREET, GWENT
 Mon.-Sat. 9am-5.30pm

SWANSEA Tel. (0792) 52877
SWANSEA MODELS & HOBBIES ★
 11 SHOPPERS WALK, OXFORD STREET
 GLAMORGAN
 Mon., Tues., Wed., 9.30am-5.30pm
 Fri. and Sat. 9.30am-6pm. Closed Thurs.

WARWICKSHIRE

BIRMINGHAM 10 Tel. 021-772 4917
BOB'S MODELS ★
 520-522 COVENTRY ROAD, SMALL HEATH
 Open 9.45am-6.30pm. Early Closing Wed.
 1.30pm

BIRMINGHAM 8 Tel: 021-327 0872
POWELL'S MODEL CENTRE ★
 769 ALUM ROCK ROAD
 Open 9.30am-5.30pm. Closed Wednesday

BIRMINGHAM Tel. 021-458-4239
TURNERS MODELDRONE (NEWSAGENTS) ★
 24 TEVIOT GROVE, KINGS NORTON
 Open 7am-1pm, 3pm-6.30pm. Sun. 8am-1pm

STUDLEY Tel. 3002
STUDLEY MODELS ★
 (B. T. WILLIAMS)
 39a ALCESTER ROAD
 9am-6pm Mon.-Wed. Half day Thurs. Late
 night Fri. 7pm

WILTSHIRE

SWINDON Tel. 26878
SWINDON MODEL CENTRE ★
 2 CIVIC CENTRE, THEATRE SQUARE
 (Next to Wyvern Theatre)
 Open daily 9am-5.30pm
 Early closing Wed. 1pm

WORCESTERSHIRE

EVESHAM Tel. 45828
P. & R. MODELS ★
 8 VINE MEWS
 Mon., Tues., Thurs., Fri., Sat., 9.15am-6pm
 Closed all day Wed.

QUINTON Tel. 021-422-1000
HOBBY SPOT ★
 280 HAGLEY ROAD WEST
 Weekdays 9.30am-6.30pm. Sat. 9.30am-5.30pm
 Wed. closed

YORKSHIRE

BARNLEY Tel. 6222
DON VALLEY SPORTS ★
 28 DONCASTER ROAD
 Open 9am-5.30pm Mon-Sat
 Closed Thursday

BATLEY Tel. 479300
BOBS MODELS (BATLEY) ★
 4 OXFORD STREET, MOUNT PLEASANT
 Open 9.30am-6pm. 7pm Fri. and Sat.
 Half day Tues.

BRADFORD 8 Tel. 26186
MODELDRONE ★
 182 MANNINGHAM LANE
 9.30am-5.45pm. Closed Wed.

£100,000 INSURANCE

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

All that is necessary for you to do to obtain the benefits of this magnificent cover is to complete the forms at the bottom of this announcement, sending the one part to us together with your remittance of £1.50, which covers you for one year and handing the other part to your usual magazine supplier. Those who wish to make the most of flying and other modelling opportunities must be insured not only for their own peace of mind—accidents do sometimes happen—but also because Local Authorities' Ministers and others are showing an increasing awareness of this need for insurance and are demanding proof of adequate cover.

It covers modelling activities within Great Britain, Northern Ireland, Channel Islands and the Isle of Man, and has been negotiated with a leading Insurance Company to provide exactly the cover which the Ministry of Defence requires when its airfields are used for model flying. It is also sufficiently embracing to cover all other forms of model activity, and so should be completely acceptable to Local Authorities requiring some cover for modellers using their boating lakes or control line flying circles. It is equally applicable to free flight models, control line models, radio control models, aircraft boats and cars.

PART II. TO BE SENT TO M.A.P. LTD.

Name (in full)

Address

..... Date

Registered No.....

I enclose herewith postal order value £1.50 for membership of M.A.P. £100,000 Insurance scheme. I understand that membership is conditional in my placing a regular order for:

• AEROMODELLER • MODEL BOATS • RADIO CONTROL MODELS
& ELECTRONICS • SCALE MODELS • MODEL ENGINEER • MODEL
RAILWAYS • MILITARY MODELLING, (*Delete those not applicable.)

I have today instructed my newsgent

Address

to deliver me the magazineuntil further notice.

PART I. TO BE HANDED TO NEWSAGENT.

To

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

Name

Address

FULL COLOUR CATALOGUE !

Detailed descriptions and FULL-COLOUR ILLUSTRATIONS of the complete range of Graupner kits, engines, accessories, radio controls, etc. . . . 200 pages and so beautifully produced that many of the colour pages are worth cutting out and framing! But, above all, it is your complete guide to the world-famous Graupner range. Available now at your local model shop.

75p

Special offer price (well below cost!) includes bonus 'FSP' booklet on latest items (10p separately)

Graupner

Modelling Modélisme Modellismo

HEY FELLAS!

Every modeller knows that a razor is the perfect blade to use. But, oh! The problems. HERE IS THE ANSWER. An all metal RAZOR blade holder with full handle that keeps the blade firm, yet allows control. The clamp swings around to guard the blade when not in use and you can alter the cutting angle.

These tools are a bulk purchase and will be advertised for a limited period only.

FULL MONEY BACK GUARANTEE

WE PAY POSTAGE

ONLY 45p each

CAN YOU AFFORD NOT TO HAVE ONE?

P. D. DESIGNS 3 BICKERTON AVE., FRODSHAM,
CHESHIRE WA6 7RE

MAPLE MODELS

(Steve Blake)

"ENGINE CLINIC" Try us first for spares, repairs, mods., this month we have established a comprehensive stock of P.A.W. spares, and accessories.

ROSSI CARBON FIBRE PROPS just arrived, can be used as supplied C/L speed 6 x 6½, 6 x 7, 6 x 7½; F/F 7 x 3½ T/R 7" dia £1.99 each + 20p P. & P.

SUPER TIGRE X40 ENGINE Strictly limited number £31.35.

PROP BALANCERS our own design—see C/L news—65p + 15p P. & P.

IRVINE ENGINE TEST STAND—Super quality, machined throughout suitable for large motors £7.95 + 40p P. & P.

"MAPLE LEAF" newsletter keeps you informed, includes S/H list send SAE.

Mail order a pleasure — SAE with Enquiries please
Access — Barclay Card — Hire Purchase — Welcome

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

DIESEL and GLOPLUG AERO ENGINES



DC Wasp 0.8cc	... £2.93
DC Merlin 0.76cc	... £3.96
DC Spitfire 1cc	... £4.70
DC Sabre 1.5cc	... £5.00
Enya 19 R/C	... £10.00
DC Rapier	... £9.08
Fox 15 R/C	... £12.85
P.A.W. 1.49 DS	... £6.00
P.A.W. 19 DS	... £7.00
P.A.W. 2.49	... £7.50
Veco 61	... £25.41
ED Fury R/C	... £8.80
Fox 25 R/C	... £11.49
Fox 36	... £9.40
Webra 61 R/C 10cc	... £36.30

Many more Aero and Marine. New Zealand orders welcome Send 7½p P.O. for Lists. Duty free — Export only. Duty & VAT UK liable customers.

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

CASTLEFORD
ARTS CRAFTS & MODELS
4 CASTLEWAY

Tel. 57619

Open 9am-5.30pm. Half day Wed.

DONCASTER
SOUTH YORKSHIRE MODEL SUPPLIES ★
24 HIGH ST., CARCROFT, Nr DONCASTER
Mon-Thur 10am-7pm, Fri 10am-8pm.
Sat 9am-6pm. Closed Wed

LEEDS
THE MODEL SHOP (LEEDS) LTD. ★
38 MERRION STREET

Tel. 457891

Open 9am-5.45pm. Half day Wed.

DONCASTER
B. CUTTRISS & SONS
40 DUKE STREET

Tel. 62524

Open 9am-5.30pm. Closed all day Thurs.

LEEDS
FLYING MODELS ★
88 CROSSGATES ROAD, CROSSGATES
Mon.-Sat. 6am-6pm, Sun. 8am-1pm

Tel. 646117

SHEFFIELD
NORTHERN MODEL CRAFTS ★
224 CROOKESMOOR ROAD

Tel 662123

Monday-Saturday 9.30am-6.00pm

DON'T WAIT UNTIL IT'S TOO LATE

Helping to solve your flying field problems is just one of the SMAE's tasks. If you care about your model flying, get the most from our sport and join YOUR national Society NOW. Send a stamped addressed envelope for more information to:

Dept MS
Society of Model Aeronautical Engineers
54 Belgrave Road
LONDON E11 3QW

The complete cover story

Now, HUMBROL offer a **complete** finishing range for flying models! Enamels, Dopes, Epoxycote and, now, Flightspan - a top quality, easy to apply film to give cover, colour and a fuel proof finish to your model. Unique multi-dimensional shrink for perfect coverage - every time.

Dopes, Epoxycote and Flightspan are "colour matched" exactly to the Humbrol range of enamels.

Use the Humbrol colour card for reference.



SHEET SIZE
1m(39 $\frac{3}{8}$ ") x 26"



ENAMEL	EPOXYCOTE	COLOUR DOPE
Bright Red	Bright Red	Bright Red
White	White	White
Black	Black	Black
Yellow	Yellow	Yellow
Lime Green	Lime Green	Lime Green
French Blue	French Blue	French Blue
Orange	Orange	Orange
Dark Grey		Dark Grey
Silver		Silver
Gold		
Baltic Blue		
Sunset Red		
Green Mist		

FLIGHTSPAN

BRIGHT RED	YELLOW	ORANGE	BALTIC BLUE
WHITE	LIME GREEN	SILVER	SUNSET RED
BLACK	FRENCH BLUE	GOLD	GREEN MIST

HUMBROL

MARFLEET · HULL



Flying Scale models



Here's a chance to build AND FLY a first class model of a famous aircraft. Many hours of building pleasure can be obtained from these remarkable kits, and for a very small outlay. Construction is traditional using balsa and tissue making attractive models capable of a reasonable flying performance. Kits include detailed plans, printed balsa sheet, stripwood, plastic propeller, noseplug, wheels, wire, rubber motor and plenty of information for the showpiece modeller. Average wingspan 18½".

WWII—Spitfire, Hurricane, Me 109, Focke Wulf 190, Mustang, Westland Lysander.

WWI—S.E.5, Nieuport, Sopwith Camel, Fokker D-8.

Military & Private—Fairey Gannet, Percival P.56, Chipmunk, Fairey Junior, Auster Arrow, Beechcraft Bonanza, Globe Swift, Cessna 140, Piper Family Cruiser, Piper Super Cruiser, Stinson, Luscombe Silvaire, Ercoupe.

24 Fully detailed models to choose from

These models can be built to display standards if desired and detailed camouflage drawings are included with the WWII fighters. Matching transfers are also available.

[See your local retailer for details](#)

PRICE 85p inc VAT

Manufactured in England by **E. KEIL and Co Ltd** Wickford Essex