Aero Modeller

July 1973

MAP HOBBY MAGAZINE

15p USA & Canada 75c.

INCORPORATING MODEL AIRCRAFT

GLIDER PLANS

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MAKING PROPELLERS

PRICES DOWN! ALMOST 7% REDUCTION THROUGHOUT
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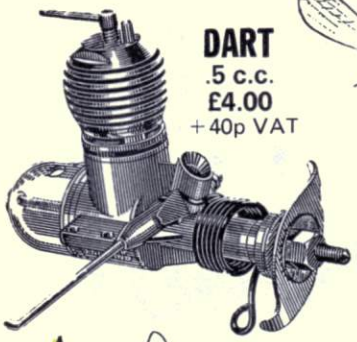

DART
.5 c.c.
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+40p VAT

SUPER MERLIN
.75 c.c.
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WASP
.049 cu. in.
£2.35
+24p VAT

at your model shop !

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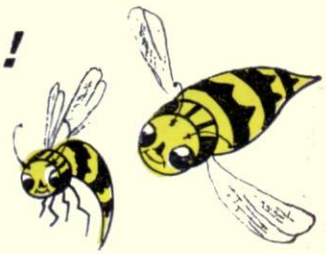
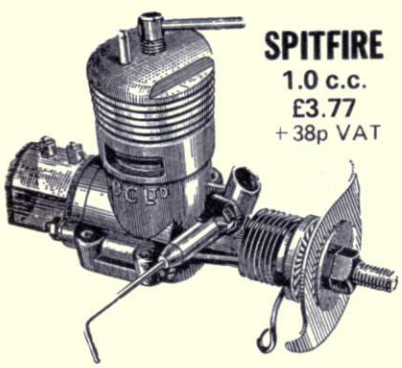
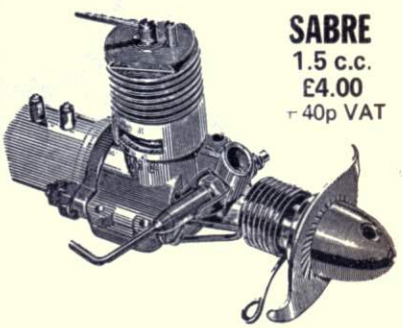
WATCH THIS SPACE
FOR A NEW STAR IN THE
QUICKSTART
RANGE OF TOP QUALITY
MODEL DIESEL ENGINES
COMING SOON
IN YOUR MODEL SHOP





SPITFIRE
1.0 c.c.
£3.77
+38p VAT



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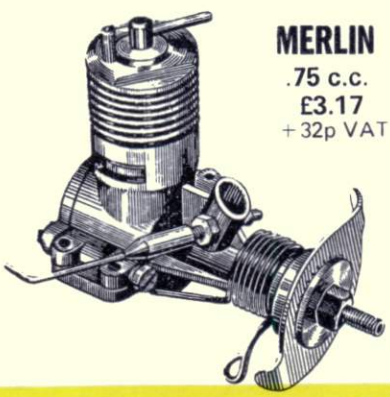


MERLIN
.75 c.c.
£3.17
+32p VAT

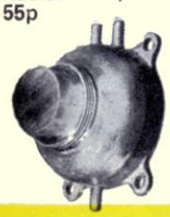
No spares-backing worries – if you have a Quickstart you can be sure of full and continuous use of your engine

Quality
Reliability
Economy

Full range of special accessories for QUICKSTART engines

(PRICES INCLUDE VAT)

Radial Tank/Mount
55p



General Purpose Tank
28p

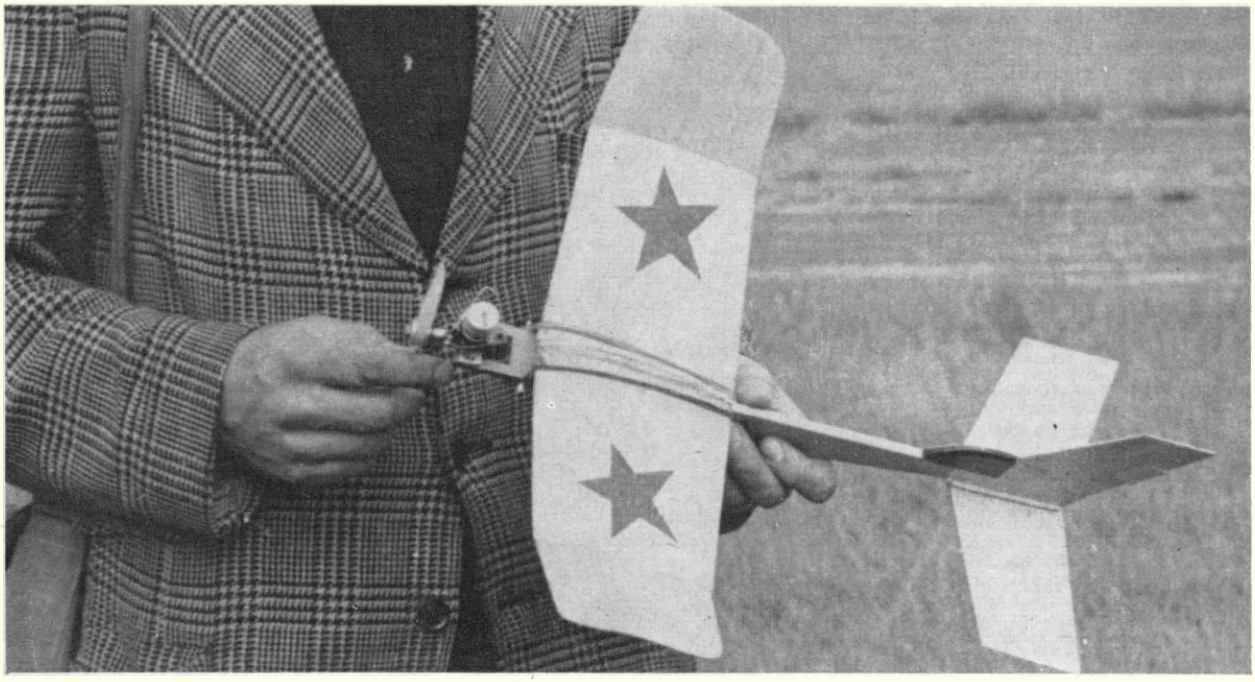
Quick Glow Clip
32p

Special Wasp Spanner 29p

Exhaust Manifold (comes with collector)
53p

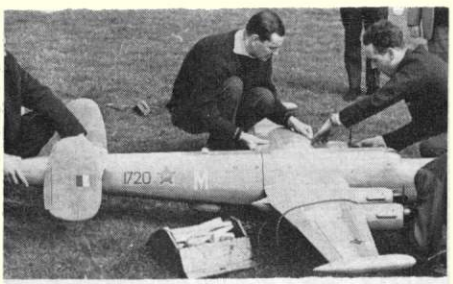
DAVIES-CHARLTON LTD. HILLS MEADOW
DOUGLAS, Isle of Man

SOLARBO



It's almost too easy to knock up an all-balsa sports model – with all the performance you want from a baby diesel or glow motor. There's even a new trick for faster building, and stronger cement joints – use 'five minute' epoxy! And the better the balsa you use* the better the results you should get.

All-balsa models also come in giant size (photo bottom left). Here balsa selection* is even more important to get strength where it is wanted, and keep the total weight down. Weight really is the enemy of flight performance – and can affect stability, too. Heavy tail units and fuselage aft sections – and wing tips – all detract from performance and stability in flight. Balsa is unique as an airframe material in offering you excellent possibilities in weight control, by the choice of wood density you use. From as little as 6 to 16-18 pounds per cubic foot.



**Balsa is also variable in quality. That's why it is also important to use true aeromodelling quality, specially selected and graded before it reaches the model shops. The Solarbo name is your automatic guarantee of this type of quality. In every piece. There's no substitute for Solarbo Balsa!*

Solarbo BALSA

ALWAYS ASK FOR IT BY NAME

SOLARBO LTD.,
COMMERCE WAY, LANCING, SUSSEX

Buy and Fly the Best... VERON

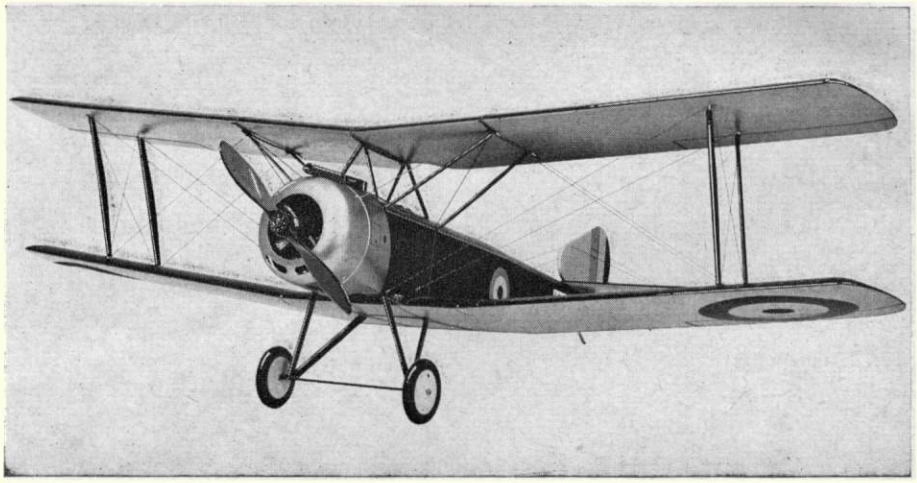
A VINTAGE YEAR FOR VETERANS!
FIRST THE HAWKER TOMTIT, THEN THE FOKKER D.VIII

48" SPAN (1220 mm)

AND NOW THE
SOPWITH 1½ STRUTTER

'VERY-NEAR-TO-SCALE'

Circa 1916-18



ISN'T SHE A BEAUTY?

Photo of our Prototype Model fitted with 2 Channel Proportional on Rudder & Elevator only (optional 3 on Motor), powered with a 3.44 c.c. 'GLOW-STAR' with Silencer.

KIT PRICE £13.85

For 2.5 to 3.5 c.c. (.15 to .19 cu. in.) A.B.S. Vacuum Formed Cowl, Semi-pneumatic Vintage Wheels, Vinyl Decals, Superlative Die-cutting, Preformed Wire Strutting & Super Kitting.

FOKKER D.VIII

46" SPAN (1168 mm)

For 1.5 c.c. (.09 cu. in.) Diesel or Glow motors with rudder only (Single Channel or One Propo), or up to 2.5 c.c. (.15 cu. in.) with 2-Channel Propo on Rudder & Elevator. Also suitable for Free-Flight with 1 c.c.

KIT PRICE
£9.16

IDEAL FOR
TAIPAN 'TYRO'
1.8 c.c. DIESEL
£6.47
Silencer **78p**

Very-near-to-scale (Class 2) Vintage W.W.I Single Seat Fighter. Circa 1917/18. Kit complete with A.B.S. Cowl & Vintage Wheels.

THE SOPWITH REQUIRES 2-CHANNEL PROPO, BUT THE FOKKER FLIES BEAUTIFULLY ON SINGLE PROPO!

LATEST PRICES FOR OUR RADIO CONTROL KIT RANGE

HAWKER TOMTIT...	£21.22	BIG EAGLE	£12.31
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FOURNIER R.F.5	£11.72	SPRINGBOK	£8.67
CHEROKEE	£17.23	ROBOT	£7.02

ALL PRICES SHOWN ARE RETAIL RECOMMENDED INCLUDING V.A.T.

FOX ENGINES
STANDARD & R.C.

NEW! – NEW! – NEW! – NEW!

FOX 19 (11900) 3.5 c.c. **£4.92**

FOX 19 R.C. (21900) 3.5 c.c. ... **£7.57**

FOX SILENCER **£1.88**

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

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

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Aero Modeller

INCORPORATING
MODEL AIRCRAFT

July 1973 Volume XXXVIII No. 450

CONTENTS

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

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

Subscription Department: Remittances to Model & Allied Publications Ltd., P.O. Box 35, Bridge Street, Hemel Hempstead, Herts HP1 1EE (subscription queries Tel. Kings Langley 62692/3). **Direct subscription rate £2.35** per annum, including December edition and index. $6 (U.S.) for overseas subscribers.

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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.)

COMMENT

Thanks to good weather, fine facilities and the magnificent spirit of the competitors, the 1973 Nationals were a resounding success. Attendance exceeded all expectations at the North Eastern venue of R.A.F. Lindholme, near Doncaster, and despite the deliberate avoidance of publicity, the public turned up in their thousands to witness what many are calling the best Nats ever held. It might be called the 'Inter-Nats', with many European Nations plus Canada, U.S.A. and New Zealand represented, and two events won by Dutch and German guests. Even an ill wind turned to good by invoking a 5 a.m. dawn start for free-flight which proved so popular that it might even become a feature next time.As ever, the separated interests divided the airfield into control-line, free-flight, and radio control camps, interspaced by well-supported scale, chuck glider and vintage centres, while at rear, by Finningley, the thermal soaring gliders turned out in force.

Tremendous thanks are due to the Royal Air Force who arranged all facilities, including a huge hangar, and extended the camp site to over twice the planned area. Also to the hard-working officials, in particular the contest directors, each of whom faced problems with expertise, and so provided a superb weekend of contest flying for the very satisfied participants – WELL DONE THE S.M.A.E.!

on the cover

Barnstorming 1973 – at Sywell during the R.C.M.&E. EXPO with the Barnstormers' Tiger Moth waiting its turn for a standing-on-the-wing display as the Army Blue Eagles trail coloured smoke through their manoeuvres.

next month

Full report on one of the best, sunniest, British National Championships for many years, plus plans, regular features, and interesting articles on all aspects of aeromodelling – on sale July 20th.

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

BOOK NEWS

IAN ALLAN
Terminal House Shepperton
TW17 8AS

Military Aircraft of the World (New Edition)

John W. R. Taylor and Gordon Swanborough

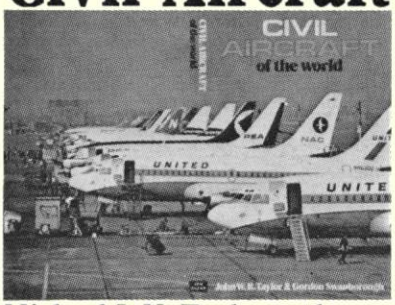
A new edition of this recognised reference work, with thoroughly revised pictorial and specification contents. Military Aircraft of the World includes not only the world's fighters and bombers, but the maritime and photographic reconnaissance aircraft, strategic and tactical transports, helicopters, training, observation and communications aircraft all in compact, easily readable form and at a very competitive price.

8¼″ x 5½″ 248pp (plus 8pp colour, including 298 photographs and 140 line drawings) £1.95

Civil Aircraft of the World

John W. R. Taylor and Gordon Swanborough

(1972 edition)

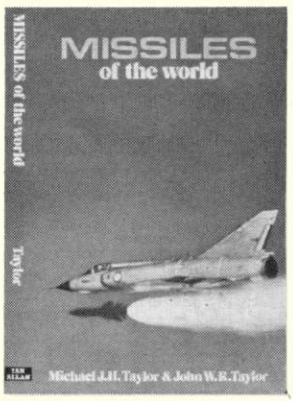


First compiled in 1967, this three part book now takes on a new appearance with a larger format as a companion to MILITARY AIRCRAFT OF THE WORLD. It describes and illustrates all significant civil-registered aeroplanes with airworthiness certificates throughout the world.

8½″ x 5½″ 168pp (including 8pp colour) £2.10

Missiles of the World

Michael J. N. Taylor and John W. R. Taylor



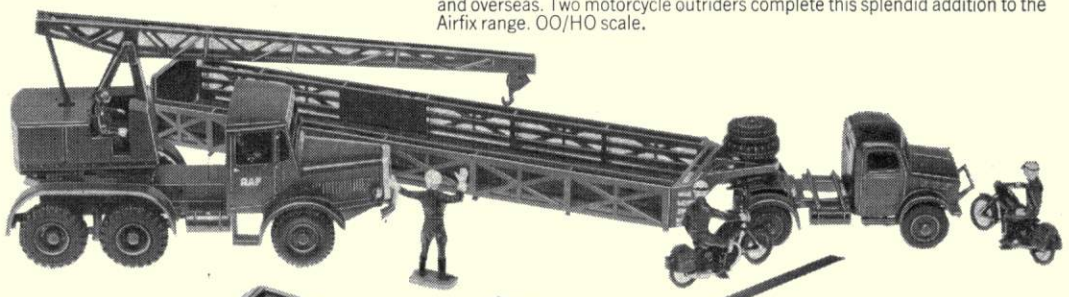
This companion to the popular MILITARY AIRCRAFT OF THE WORLD and CIVIL AIRCRAFT OF THE WORLD is the only book on the market to contain details and photographs of all guided missiles known to be in service or under development throughout the world.

8½″ x 5½″ 168pp (fully illustrated including 8pp colour) £2.50

Books are obtainable from leading booksellers or from our Retail Department (address above). When ordering direct, please send remittance, adding 10p in the £ (up to a 40p maximum) to cover postage and packing. Small paperbacks require the addition of 5p for postage and packing. (All charges quoted for postage and packing are VAT inclusive.)

AIRFIX NEWCOMERS

1. RAF Recovery Set
The kit comprises Thorneycroft Amazon chassis mounting, a Coles Mk 7 crane and a 'Queen Mary' trailer with Bedford OX tractor unit.
Each was used extensively by the RAF during the Second World War at home and overseas. Two motorcycle outriders complete this splendid addition to the Airfix range. OO/HO scale.



2. Maserati Indy
The secret of the Indy's performance (0–60 in 7.5 sec; max. speed 160 m.p.h.) is a 4.7 litre V-8 engine. Despite sleek Vignale styling, the Indy can seat 4 in comfort. Costing around £10,000, it is one of the most expensive cars on the U.K. market. The elegant Airfix kit comes complete with retractable headlamps. 1/32nd scale.

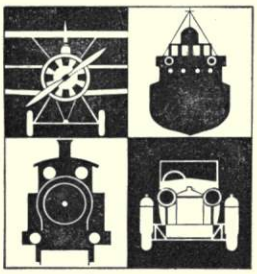
3. Puma Helicopter
The Aerospatiale / Westland SA.330 Puma is the first of three Anglo/French helicopters to enter service jointly with the RAF and the French Army. Designed as a tactical troop transport, the Puma was selected by the RAF for operation by 38 Group, Air Support Command. Optional markings, a fully detailed engine and interior are included with the Airfix kit. 1/72 scale.

4. Cessna 0 – IF Bird Dog
Originally developed for the US Army, the Cessna Bird Dog has been operating since the early fifties – most recently in Vietnam. It has been supplied to many air forces including those of France, Canada, Italy, Chile, Laos and South Vietnam. This accurate Airfix kit includes a choice of markings. 1/72nd scale.

The world's biggest range of construction kits.

Don't miss these Airfix publications! Airfix catalogue – 64 full-colour pages 15p. Airfix magazine – a 'must' for modellers. 15p monthly. Airfix books – 'HMS Victory', 'Mayflower', 'Spitfire' and 'Messerschmit BF 109' – all available now

AIRFIX



43rd Model Engineer

EXHIBITION . 1st - 12th January 1974

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

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

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

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

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

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

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

CLOSING DATE
Model entries should be in by mid-October. There are always late-comers – please enter early, it helps us. Still nearly six months to finish it!

Details from Exhibition Manager (ME), M.A.P. Ltd., P.O. Box 35, Bridge Street, Hemel Hempstead, Herts HP1 1EE

RipMax

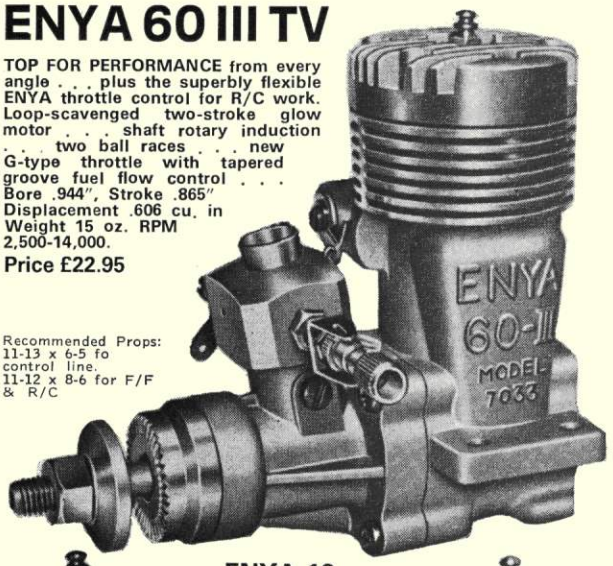
distribute and recommend .... ENYA

ENYA 60 III TV

TOP FOR PERFORMANCE from every angle . . . plus the superbly flexible ENYA throttle control for R/C work. Loop-scavenged two-stroke glow motor . . . shaft rotary induction . . . two ball races . . . new G-type throttle with tapered groove fuel flow control . . . Bore .944", Stroke .865" Displacement .606 cu. in Weight 15 oz. RPM 2,500-14,000.

Price £22.95

Recommended Props: 11-13 x 6-5 fo control line. 11-12 x 8-6 for F/F & R/C



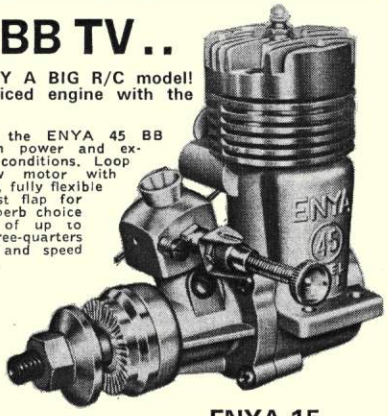
ENYA 45 BB TV..

POWER ENOUGH TO FLY A BIG R/C model! This is the modestly-priced engine with the BIG PERFORMANCE!

Expert aeromodellers pick the ENYA 45 BB for its easy starting, high power and extreme reliability under all conditions. Loop scavenged two-stroke glow motor with twin ball race main bearings, fully flexible throttle and coupled exhaust flap for precise speed control. A superb choice for radio control models of up to 5 ft. span, with over three-quarters of a horsepower available and speed range 2,000 to 13,000 r.p.m.

Bore .878". Stroke .756". Disp. 0.457 cu. in. (7.5cc) Recommended Props: 11 x 6 for Control line: 11 x 5-6 for F/F & R/C

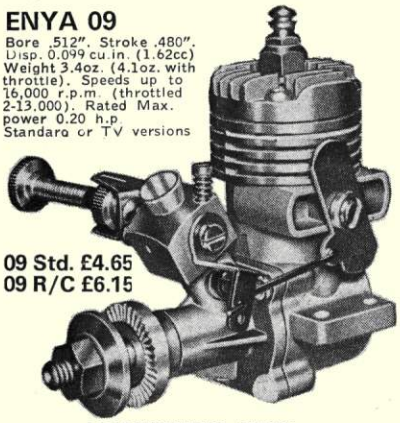
Price £16.60



ENYA 09

Bore .512". Stroke .480". Disp. 0.099 cu.in. (1.62cc) Weight 3.4oz. (4.1oz. with throttle). Speeds up to 16,000 r.p.m. (throttled 2-13,000). Rated Max. power 0.20 h.p. Standard or TV versions

09 Std. £4.65
09 R/C £6.15



RECOMMENDED PROPS: 7-8 x 6-4 for control line; 7-8 x 4-3 for F/F; and 8 x 4-3 for R/C.

ENYA 15

Bore .590". Stroke .551". Disp. 0.15 cu. in. (2.47cc) Weight 4.8oz. (5.2oz. with throttle). An international contest size motor. Develops 0.53 h.p. with speeds up to 16,000 r.p.m. Available with standard carburettor or R/C throttle

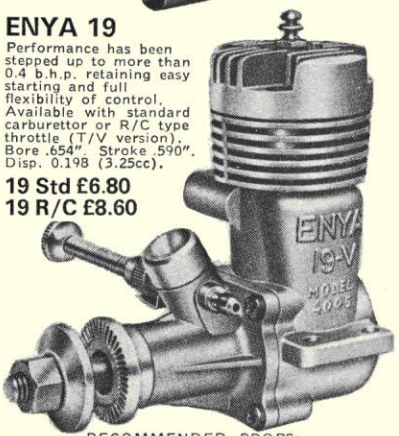
15 Std £5.95
15 R/C £7.75

RECOMMENDED PROPS: 8 x 6-5 for control line; 8 x 4 for free flight; 8 x 4-3 for R/C

ENYA 19

Performance has been stepped up to more than 0.4 b.h.p. retaining easy starting and full flexibility of control. Available with standard carburettor or R/C type throttle (T/V version). Bore .654". Stroke .590". Disp. 0.198 (3.25cc).

19 Std £6.80
19 R/C £8.60



RECOMMENDED PROPS: 8-9 x 6-5 for control line; 9 x 4 for free flight; 9-10 x 4 for R/C

ENYA 35

Rugged, dependable plain bearing glow motor for larger sports models. Supplied with alternative heads for low (7.5:1) or high (9.1:1) compression ratio, to match straight or doped fuels. Bore .803". Stroke .704".

35 Std £8.75
35 R/C £10.80

Disp. 0.357 cu.in. (5.85 c.c.). Weight 7.7 oz.

RECOMMENDED PROPS: 10 x 6 for control line: 10-11 x 5-3 for free flight; 10-11 x 6-4 for R/C

ENYA 35BB

Specially designed as a long-lasting engine with twin ballrace main bearings. An R/C type throttle is fitted as standard, giving a speed range of 2,000 to 13,000 r.p.m. Rated at 0.85 h.p. max. Bore .803". .704" Disp. 0.357 cu. in (5.85 c.c.). Weight: 9.1oz.

Price £11.95

RECOMMENDED PROPS: 10 x 6 for control line; 10-11 x 5-3 for free flight; 10-11 x 6-4 x 6-4 for R/C

PROVEN POWER!

Precision made by master craftsmen, ENYA ENGINES are renown the WORLD OVER fo HIGH POWER OUTPUTS plus easy starting, smooth running, superb handling characteristic and long, long life! Today's prices arre HIGHLY COMPETITIVE, too! And unrepeatable!

ENYA ACCESSORIES

SILENCERS

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

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

THROTTLES

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

Needle Assemblies

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

★ **ENYA ENGINES ARE DISTRIBUTED THROUGHOUT THE U.K. BY RIPMAX LTD.** ★

SEE THEM ALL AT YOUR LOCAL MODEL SHOP!

SUPER Tigre Choice of Champions!

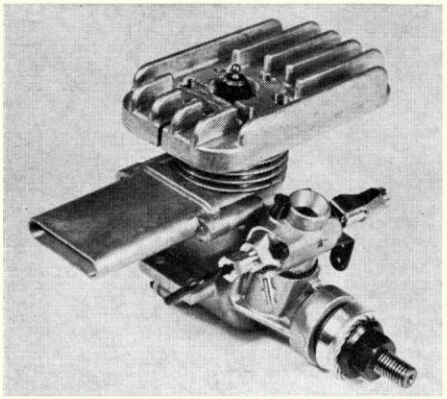
THE NAME THAT STANDS FOR SPEED & POWER

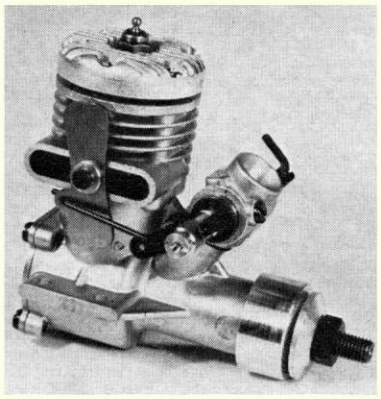
In view of the erratic deliveries we have been getting from our Italian partners, due to the strikes mentioned in the June issue, we are going to try a new system with our Super Tigre adverts for the next few few months. This is an attempt to try to provide you, the modeller and hobby dealer, with up to date information as to what engines are in stock here at our Watford factory.

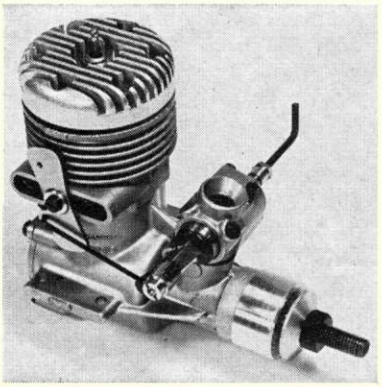
If you look at the list of engines shown below you will note an asterisk beside some of the engines. This means that delivery is expected to be from stock by the time you read the advert. Of course, it may well be that your local dealer has some of our engines already on the shelf because he had the foresight to order in advance, so we always suggest that you give him first try.

This system is obviously going to be difficult to make 100% accurate due to the erratic supply situation and the lead time of the adverts but we hope it will prove more successful than the hit and miss system we have had in the past.

We are adding as many of the accessories and their prices as is possible to the columns shown below and although this is by no means a complete list it will at least cover the essential items such as silencers and consumable spares.







G15/19 CAR £18.49

G20/15 D	£9.90
G29/15 D R/C	£12.17
G20/15 G	£9.90
G20/15 G R/C	£12.17
G15 F.1 with-spinner	£12.58
G15 F.1 R/C	£15.74
G15 R.V. D	£15.65
G15/19 F.1 R/C	£15.74
G15 R.V. G	£15.65
G15/19 F.1	£12.58
G20/23	£9.90
G20/23 R/C	£13.10

ST.35 R/C £13.72

G15/19 CAR	£18.49
G21/29 R.V. ABC	£17.09
G21/29 F.1	£12.17
G21/29 F.1 R/C	£15.24
G21/35 F.1	£12.40
G21/35 F.1 R/C	£15.45
G21/40 F.1	£13.21
G21/40 F.1 R/C	£16.17
G40 ABC R/C	£19.08
G21/46 F.1 Std.	£13.82
G21/46 F.1 R/C	£17.01
ST.35 Std.	£10.57

ST.60 BB R/C £19.30

ST.35 S R/C	£13.72
ST.51 R/C	£17.08
ST.56 R/C	£18.29
ST.60 R/C	£19.30
G60 F.1 R/C	£24.38
G71 F.1 R/C	£24.89
G60 R.V. Racing	£30.49
G60 Marine	£33.53
G60 Marine R/C	£35.57
G21/29 M	£18.76
G21/29 R/C M	£21.25
G15 R/C M	£17.06

ADDITIONAL SPARE PARTS AND ACCESSORIES PRICES

SUPER TIGRE ACCESSORIES

Silencers

S.15 fits G20/15, 19, 23	£2.70
S.29 fits G21/29, 35, 40, 46	£3.30
S.35 fits ST.35 Stunt or Combat & R/C	£3.30
S.40 fits G40 only	£3.30
S.56 fits ST.51, 56, 60	£3.30
S.71 fits G60, F.1 or R.V. and G71	£3.75
G15 tuned pipe	£2.70
G21/29 tuned pipe	£3.30
G60 tuned pipe	£3.75
Glow plug standard	36p
Glow plug R/C	68p
Glow plug speed	46p
Spinners G15, G29 and G60	£1.25
Spinners Screw on type 2⅛" dia.	£1.75
Radial mount G20/15, 19, 23 and G15 series	£1.87
Radial mount G21/29, 35, 40, 46	£1.87
Radial mount ST.51, 56 and 60	£1.87
Needle valve, all sizes except G20 R/C	15p
Needle valve, G20 R/C series	15p
Needle valve and spray bar	50p
Mag. 111 Jet assembly	62½p
Idle needle assembly	62½p

R/C Carburettors

Mag. 111 G20 and G15 series	£3.75
Mag. 111 G21, 60 and ST series	£4.25
Seelig Gambrinus Free flight mount	£3.00
R/C car heat sink	£2.00
Exhaust extension (R/C car)	£1.25

SUPER TIGRE MOTORS ARE AVAILABLE FROM THE VERY BEST MODEL SHOPS

WORLD ENGINES

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PHONE WATFORD 42859

VISITORS BY APPOINTMENT

S.A.E. WITH INQUIRIES PLEASE

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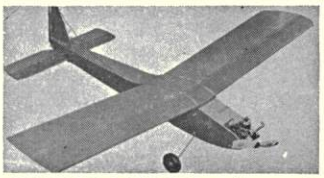
RIPMAX FOR YOUR KITS

RIPMAX 'KWIKFORM' KITS

With veneer-covered Styro-Tru wings, all balsa and ply parts precut, hardware, etc. Designed for R/C flying.

EINDECKER near-scale 56" span £14.30
Kit includes aluminium cowl, wheels.
Also **NIEUPORT 18** £16.80
SOPWITH SWALLOW £15.70
B29 MITCHELL 74" £39.95



FOUR NEW DAZZLERS – all now with nosewheel undercarts and other detail design changes, etc. These de-luxe kits include veneered STYRO-TRU foam wings, precut balsa and ply parts, and hardware.

FOR SINGLE-CHANNEL R/C
All new **DAZZLER 30** (30" span) £4.60
All new **DAZZLER 36** (36" span) £5.95
All new **DAZZLER 42** (42" span) £7.40

FOR MULTI & PROPO R/C
DAZZLER 48 (48" span) £9.50
DAZZLER 54 (54" span) £11.70
DAZZLER 63 (63" span) £13.90
BASIC MINI-TRAINER (R/C) 48" £9.60
FULLHOUSE MINI-TRAINER 48" £10.60
BASIC TRAINER 60" £11.80
FULLHOUSE TRAINER £12.80
SENATOR 52" £10.90
SUPABIPE 50" £15.45
SKYQUEEN 58" £9.95
IVINGHOE 72" £9.80

RIPMAX GANGSTERS

Gangster 48 £14.45
Gangster 63 £17.95

Foam-plastic wings; all balsa and ply parts precut, tank, hardware, etc. Fully aerobatic R/C models for modern proportional radio. SUPER DE LUXE KITS for quick assembly!

RIPMAX SPITFIRE £20.95

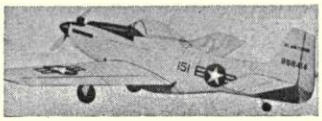
A 63" span near-scale model for .40-.61 engines. Realistic scale appearance – without the handling problems of many scale models! Kit includes veneered foam wings, precut balsa and ply parts, moulded canopy, engine mount, formed wire undercart, nylon horns and wing bolts, hinge material, 7" diameter rounders, etc.
A SPECIALLY RECOMMENDED KIT!

SPITFIRE WINGS ONLY are available separately pair £8.00
SPITFIRE CANOPY 40p

STERLING KITS

Top models specially selected from the STERLING range by RIPMAX – scale and freelance designs, each one in pre-fabricated kit form. The R/C scale models are also adaptable to CONTROL LINE if preferred. Choose your favourite from this famous American range.

KING COBRA 70" £22.80
SPITFIRE 64" span £24.40
STEARMAN PT17 64½" £28.95
FOKKER D-7 58½" £25.50
SE5A BIPLANE 40½" £13.80
WIZARD BIPE 54" £13.25
LANCER 53½" span £15.95
SUPER LANCER SL-62 ... ... £20.95



PIPER TRI-PACER 58¾" ... £12.70
CESSNA 180 45" span £7.95
FAIRCHILD PT-19 48" £9.95
PIPER CUB J-3 54" £9.50
PIPER SUPER CRUISER 72" ... £19.60
MUSTANG P-51 66" £24.40

RIMFIRE 56" span £14.80
SCHWEIZER 1-34 98½" £15.95
SCHWEIZER 1-26D 70" £11.65
FLEDGLING 56" span £14.30
CITABRIA 54" span £15.95

NEW STIRLING KITS

CURTISS JENNY* 32¾" span ... £4.25
FOKKER TRIPLANE* 23½" ... £4.25
DIAMANT SAILPLANE 74* ... £4.25
P-40 WARHAWK* 27" span ... £4.25
CITABRIA* 33½" span £4.25
PIPER SUPER CRUISER* 35½" £4.25
CIRRUS 87¼" span £5.80
* rubber powered

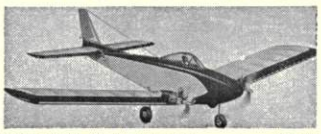
STERLING CONTROL LINE

SE5 Biplane 32" span £7.95
Fokker D-7 32½" span £7.95
Corsair F4U-1 35" span £8.50
Nieuport 28 33" span £7.95
Stearman PT17 32¼" £7.95
Great Lakes Trainer 36" £7.95

GOLDBERG KITS

SNR FALCON DE LUXE 69" ... £22.30
FALCON 56 DE LUXE 56" £11.95
JNR FALCON DE LUXE 37" ... £4.75

SKYLANE 42 DE LUXE scale ... £5.95
SKYLANE 62 DE LUXE scale ... £22.30



SKYLARK 56 DE LUXE £13.80
JUNIOR SKYLARK DE LUXE 37" £5.35
SHOESTRING P/RACER 54" ... £17.95

CONTROL LINE

SWORDSMAN 18 18" span ... £2.10
LI'L WIZARD 21" span £2.35
LI'L JUMPIN' BEAN 21" ... £2.10
SHOESTRING STUNTER 42" ... £4.75
LI'L SATAN Combat 19" ... £1.80
RILEY WOOTEN VOODOO 36" £2.95
JUNIOR SATAN 29" span ... £2.35

TOPFLITE KITS

Superb all-sheet balsa construction (fully die-cut parts) which make up into wonderful flying models. PLUS a further range of DE LUXE R/C models – freelance and TRUE SCALE.

SCHOOLBOY 29" span £2.95
SCHOOLMASTER 29" span ... £5.50
HEADMASTER 48" span ... £9.75
SCHOOLGIRL BIPE 32" span ... £4.95
RASCAL 27" span £2.80
ROARIN' 20 19¼" span £2.80
CESSNA 172 30" span £3.45
TOP DAWG 39½" span £8.35
SE5A BIPLANE 53" span ... £26.50
R/C NOBLER 51" span £16.70
CONTENDER 54" span £19.45
P-51 MUSTANG 60" span ... £24.95
P-40 WARHAWK 60" span ... £27.80
P-39 AIRACOBRA 60" span ... £27.80

TOPFLITE CONTROL LINE

NOBLER 50" span £8.90
FLITE STREAK 42" span £4.45
JNR FLITE STREAK 31" span £3.30
JUNIOR NOBLER 40" £5.30
PEACEMAKER 46" span £6.20
P-40 WARHAWK 28" span £6.65
P-47 THUNDERBOLT 27" span £6.65
P-51D MUSTANG 37" span £9.95
P-40 TIGER SHARK 42" £4.95
HAWKER HURRICANE 42" £4.95

STERLING

A superb series of RUBBER-POWERED FLYING SCALE MODELS, many with IN-FLIGHT ACTION FEATURES. Convertible to powered free flight or control line models.

Fokker D-7 24" £3.20
Stearman PT17 Crop Duster £2.65
Beechcraft Bonanza 22" £2.10
P-47 Thunderbolt 20" £2.10
Nieuport 17 24" £3.20
Stuka Dive Bomber 20" £2.10
Piper Super Cub 18" £1.05
Messerschmitt Me109 17" £1.30
AT-6 Texan 18" £1.30
Curtiss Hawk P6E 16" £1.60
L-19 Birddog 17" £1.05
P-51D Mustang 24" £3.20
F4U-5 Corsair 24" £3.20
Zero 24" £2.65
Fokker D-8 21" £2.10
SE5A biplane 22" £3.20
Ansaldo S.V.A.5 19" £1.85
Spitfire Mk. I 24" £2.65
Focke-Wulf 190 24" £2.65
Spad 13C 24" £3.20
Fokker Eindecker 25" £2.10
GT Lakes Special 24" £2.65
Aeronca C3 36" £3.20
Sopwith Camel 24" £3.20
Schweizer glider 43" £1.85

GRAUPNER GLIDERS

FOUGA SYLPHE (Jetex) 26" span £2.10
BEGINNER 39" span £3.25
FILOU 50" span £5.80
Pylon engine mount £1.05
JOLLY 45" span £4.30
Pylon engine mount £1.05
AMIGO 2 78¾" span £9.95
Pylon engine mount £1.40
Ditto in ABS £2.80
FOKA 102¼" span £16.80
Canopy 75p Fuselage £6.20
Wing grommets (10) £1.10
UHU Mark III 43¼" ... £3.35
DANDY 63" span £8.25
Pylon engine mount £1.05
CIRRUS 118" span £22.40
Canopy 59p Fuselage £10.20
Mounting ribs £1.20
Canopy frame £1.45
Pylon engine mount £1.70
R/C pack £3.55
NANCY 48¾" span £4.90
KATY 67¼" span £9.30
CUMULUS 2800 110" £49.95
Canopy 60p Fuselage £16.60
Wings (pair) £20.60
Stabilisers £7.75
Rudder £4.10 Cabin £3.80
Canopy frame £1.45
Pylon engine mount £1.70
R/C pack £2.90
AS-K14 90½" span £44.60
Canopy 55p Fuselage £19.60
R/C pack £4.85
HI-FLY 90½" span £14.20
R/C pack £2.45
Pylon engine mount £2.80
Electric motor flight pack £9.60
Installation pack £3.25
E/F battery £12.60
Folding prop £1.45

GRAUPNER C/L KITS

MUSTANG 29¾" span £6.30
DORNIER Do27 29¾" £7.85
FOCKE WULF 190 38¾" £9.50
KLEMM KL-107B 28½" £6.55

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

SEE THEM ALL AT YOUR LOCAL MODEL SHOP!

KINDLY MENTION 'AEROMODELLER' WHEN REPLYING TO ADVERTISEMENTS

Heard at the HANGAR DOORS

AEROMODELLER ALL SCALE day at Old Warden Aerodrome, Shuttleworth, Near Biggleswade, Bedfordshire on Sunday 17th June, starts from 10 a.m. There are no entries to bother about, just register at the M.A.P. stand as you come in and from then on it's *FLYING FOR FUN*. The Judges will be walking round during the day observing and the results will be announced at 5 p.m. Special prizes for Juniors! This is a grand day out for all the family with the added attraction of the many veteran planes on view in the Shuttleworth Collection. Admission to the Airfield is 30p adults, 15p children (car park free) which is the normal admission fee for the Museum.

FREE FLIGHT WORLD MODEL AEROPLANE CHAMPIONSHIPS, Wiener Neustadt, Austria 14th-19th August 1973. In conjunction with Orion Travel, AEROMODELLER is pleased to offer a fully inclusive visit to the Championships in Austria at a cost per person of £79.90. This includes return air travel by scheduled service, 7 nights accommodation in twin bedded room at the Hotel Josefsplatz, Baden, including continental breakfast, service charges and taxes. *PLUS* return travel by private coach on each of 6 days between Baden and the Championships in Wiener Neustadt in the morning and evening *AND* the services of Orion Travel tour manager travelling with the group throughout. This is an opportunity for a combined Championships / holiday – you could even take the wife! Full details from AEROMODELLER offices on receipt of a stamped addressed envelope. No phone calls please. Offer closes July 2nd.

DANISH CONTROL LINE flyers who enjoyed their trip to the British Nats are anxious to reciprocate. Invitations are extended to British combat, team race, speed or aerobatic competitors to fly at their next event at the beginning of July in Copenhagen (telephone Va 1067 for directions) and the Danish Nats at Alborg, Jutland on September 1/2nd. We'd be pleased to put possible visitors in touch.

FREE FLIGHT COMMENT is taking a break this month due to tight printing schedules – back in August with contest reports and hints for the novice by John O'Donnell.

WITH DEEP REGRET we have to report the death of Mr. George Leask, pioneer Scottish aeromodeller and precision engineer, whose name was known throughout the land for his untiring efforts to boost the cause of Aeromodelling and particularly Scottish Aeromodelling. George was a staunch Scottish Nationalist, and his kilted figure was to be seen at any modelling event from the 1930s onward.

Immediately post war, George turned his talents to the design and manufacture of the 'Clansman' 5 cc diesel engine which he always claimed was on sale before the Mills 1.3. Certainly he was very early in field and an excellent engine it was capable of swinging a 15 in. prop at no mean revs and of flying a 12 ft. 6 in. wingspan cabin power model as a test bed. Not content, George went on to market two different brands of fuel, namely 'Caley' and 'Caley Supreme', from his shop *The Caledonia Model Company* of 5 Pitt Street, Glasgow, a name synonymous with service to the modellers of Scotland. If it could be used for modelling, 'George' stocked it. For some years too he allowed his shop to be the rent free meeting place of the Glasgow Model Aircraft Club and many hours of model design and hangar flying sessions took place there.

George was a bundle of energy, coupled with exceptional organizing ability, and instigator of the *Scottish Aeromodellers Association* the Scottish S.M.A.E. equivalent. As President and Chairman he steered the Association through it's early years and teething troubles.

In 1965 modernisation of Glasgow City Centre swallowed up the premises of the *Caledonia Model Company* and George retired to his beloved Highlands at Gairloch in Wester Ross, where he died on Saturday, 19th May 1973. With his passing Scotland has lost a true son, and Aeromodelling a leading light. We extend our sympathy to his wife and son.

APOLOGIES CORNER: Firstly to the Dutch Daedalus club who are holding their Amsterdam International Combat Contest at Spaarndam on August 18-19th. Seems we got the organiser's address rather scrambled, as it should be: E. Meijer, Aalbersestr. 10, Amsterdam – W, The Netherlands. Telephone 020 130761.

Secondly, to *Taurus Press,* whose *Data Plan No. 1* book Eric Coates reviewed in the June issue. It seems we got our caption somewhat confused. The book covers the *Hawker Woodcock* and *Danecock* series, not the Hawker Woodcock and *Gamecock* as stated. As the Gamecock was a *Gloster* aircraft, it's obvious we don't know our Game from our Dane, cock!

Finally, apologies to the Leeds club for omitting details of their rally in the last Contest Calendar. Details of this meeting to be held on June 24th are that contests will be held for A/2 gliders (with a guaranteed minimum £5 first prize), Open Power, Open Glider, Hand Launch Glider, plus a 'Mini' Comp. Vintage fans are catered for by both Duration and Precision events, while handle-wavers participate in the combat comp, which begins at 11 a.m., the remainder at 10 a.m. Venue is R.A.F. Topcliffe, the meeting being open to S.M.A.E. members *only* – and take proof of insurance.

KREMER PRIZE for the first person to complete the well-known figure of eight course in a man-powered aircraft has been increased to no less than £50,000, as of May 30th! Although the prize has thus far been out of reach for the many man-powered aircraft built to date, it is clear from the efforts being made that serious attempts are imminent, some of them by radical designs. Due to fly in June, after modification, are the H.P.A. 'Toucan' at Radlett and the M.I.T. 'Burd' at Bedford, Massachusetts, U.S.A. Each is two-man powered, and the M.I.T. machine is a biplane canard.

STOP PRESS – INDOOR INTERNATIONAL – SLANIC, – ROMANIA 11 – 13th May 1973.

		Best two flights		*Total*
1. A. POPPA	*Romania*	36:16	39:16	75:32
2. E. HOLTIER	*Romania*	37:01	37:21	74:22
3. K. RYBECKY	*Czech*	37:05	35:32	72:37

(*best out of 6 flights*)

Best U.K. placings: *J. Blount* 10th, *R. Parham* 11th and *L. Barr* 14th out of 19 entries.

Full report and pictures to follow next month.

The designer's wife holds aloft the big beast – not such a difficult task really as the all-up weight is around 20 ounces – resulting in quite a low wing loading and hence good glide performance.

Bigger the better? Only way to find out is to build this 97 in. span 'open' class glider designed for sport or contest flying by Tony Cordes.

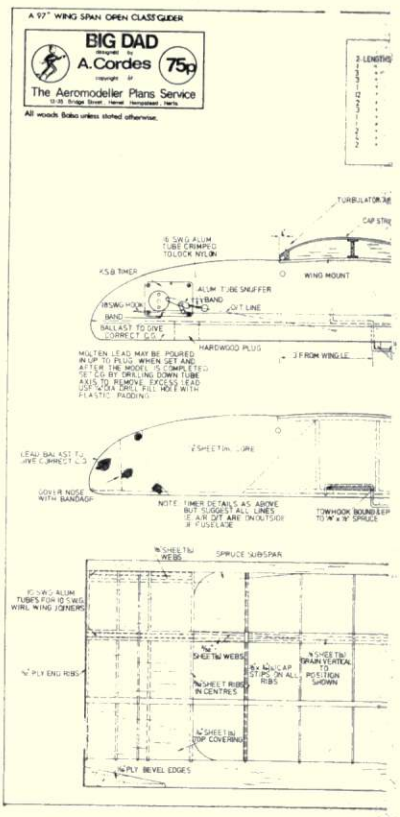
BIG DAD

'BIG DAD' was designed and built during the winter of 1970/71. At that time John Boon and others had been having considerable success in Open Glider fly-offs held in calm weather conditions by using scaled up, very lightweight *Caprices*. However these models were restrictive in that they could only be flown in very calm conditions since in order to keep the model weight right down, wood sizes were minimised resulting in a relatively fragile structure. In view of this, *Big Dad* was intended for use in a broader spectrum of weather conditions, i.e. to be used in windy conditions if necessary. It has consequently a fairly robust wing structure and the original has been flown in winds of up to 20 m.p.h. without sustaining any subsequent damage.

I had hoped that by using a big, lightweight model, operating at higher Reynolds numbers than A/2 gliders, that a more stable and perhaps superior glide would result. However this did not prove to be the case and *Big Dad* will only glide as well as a standard A/2! So what then are the advantages of building and using a large Open Glider? First of all, in my view, it presents a pleasant change; like marine engineering compared to electronics! Secondly, performance-wise one can get a comparable glide to an A/2 without having to resort to sophisticated airfoils and building techniques – the wing section used in fact utilises commercially available shaped leading and trailing edges. Thirdly, in a fly-off it can be seen longer: the model has a good psychological effect on the timekeeper, since on the ground it looks so big that he naturally assumes that he is going to see it longer than his contemporaries who are about to time smaller models.

Although *Big Dad* was originally built to be competitive in Open Glider events, particularly in fly-offs, I have not had the chance to fly it very often in competition, mainly because the wind strengths have more often than not been in excess of 15-20 mph, or I have not been able to string three maxes together in an Open event with an A/2 to reach the fly-off! However, I have found it a pleasure to fly for fun – yes, some keen competition flyers still do this Mr Pylonius!

On a pleasant summer evening (we get one or two in the North of England) a lot of satisfaction can be derived from watching *Big Dad* apparently gliding very slowly, compared with smaller models. I say apparently because the size of *Big Dad* creates the illusion of slower flight even though it must be gliding with a forward velocity similar to that of the other models. Also, when towing such a model one certainly realises that one has a model at the other end of the



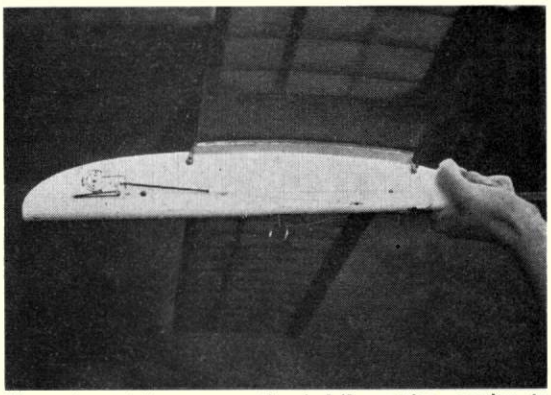
FULL-SIZE COPIES OF THIS 1/7th SCALE REPRODUCTION ARE AVAILABLE AS ORDER No. G1199, PRICE 75p INCLUSIVE OF V.A.T. AND POSTAGE, FROM AERO MODELLER PLANS SERVICE, P.O. BOX 35, BRIDGE STREET, HEMEL HEMPSTEAD, HERTS. HP1 1EE.

line. It gives a good solid pull.

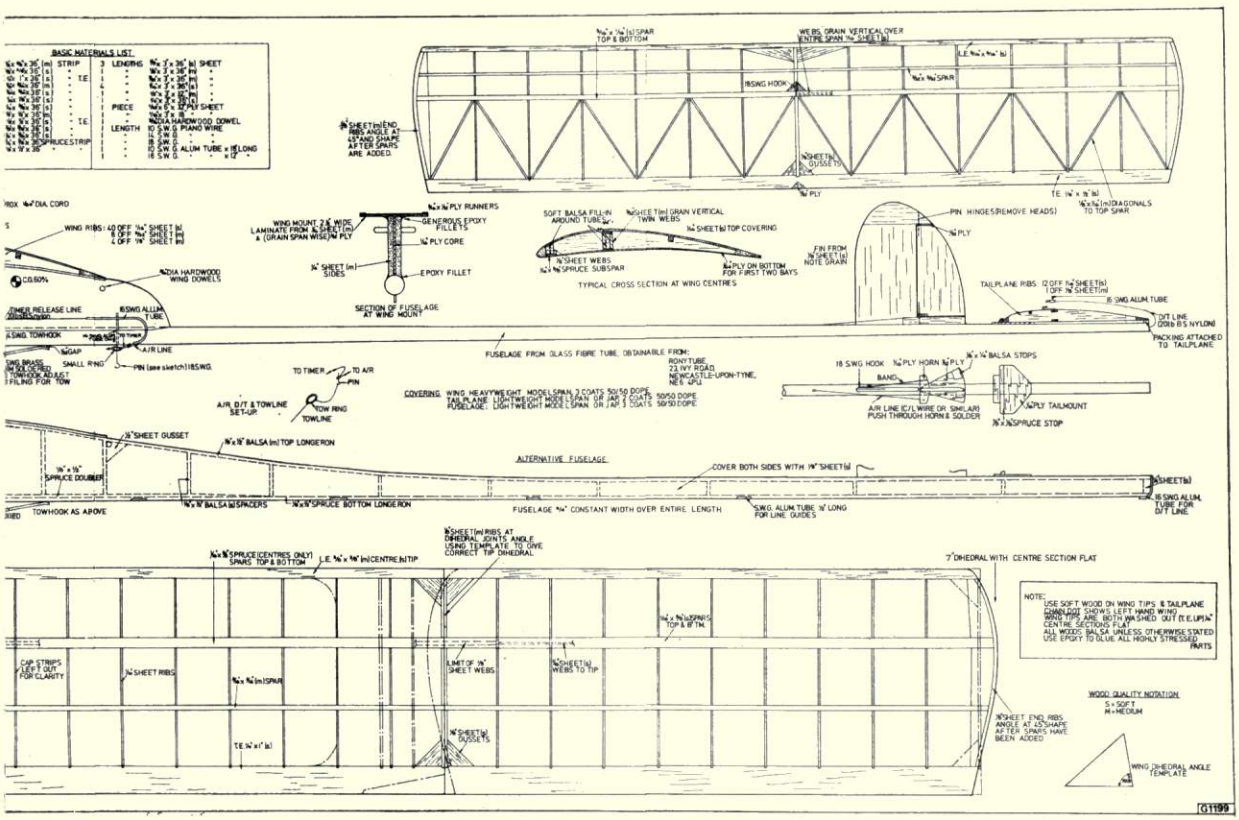
Construction of *Big Dad* is very '*standard*' and should present no difficulties to anyone who has built a glider before. I recommend that unless otherwise stated a non-shrinking adhesive such as P.V.A. should be used throughout to avoid distortion of the structure, and that when doping the covering a mixture of 40 per cent/40 per cent/20 per cent of dope/thinners/banana oil be used; again to avoid distortion due to excessive shrinkage.

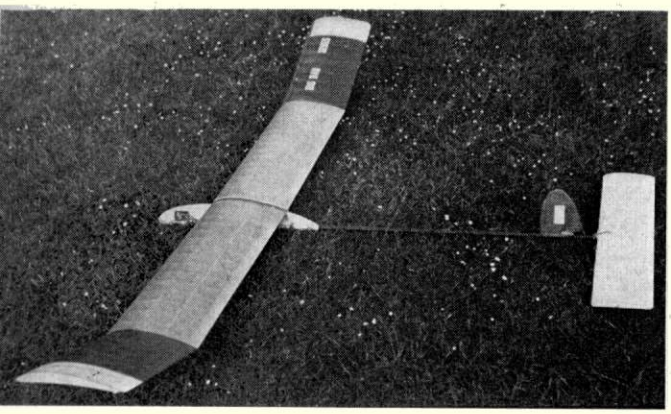
Before commencing the building, certain decisions ought to be made. Firstly, do you intend the model to be an out and out contest type? In this case select light wood as suggested on the plan and an all up weight of around 16 oz. should result, although giving a model which some may consider fragile. Alternatively, you may wish to have a stronger model to enable it to be flown more generally and so heavier grade wood may be used throughout giving an all up weight of around 20 oz. If you intend to fly *Big Dad* mainly as a sport model then all up weight of up to 30 oz. is quite permissible and 'British Model Shop Standard shelf wood balsa' can be used. It may be of interest to know that the original model is in the 20 oz. category. Secondly, you must decide whether or not to use a glass fibre tube fuselage. Without question these are superior as regards strength for little or no penalty in weight, but they are unfortunately more expensive. The materials list given on the plan is for the construction including a 'wooden' fuselage.

It is better to begin by building the wing so that it may 'settle' while the rest of the model is built. As can be seen from the plan the wings are built one half at a time. Start by pinning down the shaped leading and trailing edges and pack up the rear of the L.E. by 1/32 in. and the front of the T.E. by $\frac{1}{8}$ in. to accommodate the undercamber. No warps need be built in at this stage. Glue in all the ribs and use the template to correctly angle the $\frac{1}{8}$ in. dihedral ribs. At the tip, glue in a rectangular piece of $\frac{1}{8}$ in. sheet angled at 45 deg. When all is dry remove from the board and add the bottom spar and the small centre sub spar. Pin the panels back on to the board and glue in all the webs. Build the other half of the wing to this stage. Pin both centre panels down so that the joining tubes may be glued in as follows. First cut away those portions of the ribs between the double webs on the main spar and between the webs and the L.E. on the sub spar. Second, cut to length the 10 s.w.g. aluminium tubes and the 10 s.w.g. steel wire joiners, and slide the tubes into position over the joiners. Third, using epoxy, pack the bottom of the slots into which the tubes go so that they are aligned



Nose shape follows conventional A/2 practice, serving to carry the wing on a low pylon. Plan details construction of both a built-up fuselage and one utilising a glass fibre tube.





Doesn't look so big on the ground does it! Never mind, build one and see how much dope it consumes! Bigger they are, the easier they are to see – and lose, so make sure the D/T works reliably on every flight.

at the correct height. Fourth, using epoxy, glue in the tube and joiner assemblies and finally pack the tops of the slots with balsa so that the wing section is again flush. When all the epoxy is set pull the wing panels apart and remove the joining wires. Once again pin the panels down and add the top spars, centre sheeting and cap strips. The tip ribs are shaped next by marking off their shape from the existing ribs. This is best done by laying a straightedge spanwise across the ribs and putting a pencil dot where the straightedge intercepts the $\frac{1}{8}$ in. sheet. Then simply carve and sand to shape by joining up the dots. Using a large flat file or sanding block flush the dihedral joints and then epoxy the tip panels to the centre panels checking that the tip dihedral is 7 in. Complete the construction by adding the $\frac{1}{8}$ in. gussets, 1/32 in. ply end ribs, 1/64 in. ply centre sheeting and the 1/16 in. ply T.E. fillets. Cover and dope the wings to choice depending on the final desired total weight of the model. Care should be taken when doping – do one panel at a time, packing to give the required warps, and ALWAYS pinning down.

The tailplane is built in a similar fashion to the wing, taking care to make it as light as possible. Preshape the leading and trailing edges and pin down. Add the ribs and the $\frac{1}{8}$ in. sheet end ribs angled at 45 deg. Remove when dry, add the bottom spar, re-pin down and add the webs. Glue in the top spars, $\frac{1}{8}$ in. sheet gussets, and $\frac{1}{8}$ in. x 1/16 in. diagonals. Complete by shaping the end ribs, adding the 18 s.w.g. wire and the 1/32 in. ply T.E. fillet. Cover with lightweight tissue, Modelspan or Japanese and give two coats of dope.

As for the fuselage, cut glass fibre tube to length by removing the surplus from the 'fat' end. Drill the 14 s.w.g. holes to take the towhook. Cut out the 1/16 in. ply pod keel, allowing for the D/T timer if one is to be used.

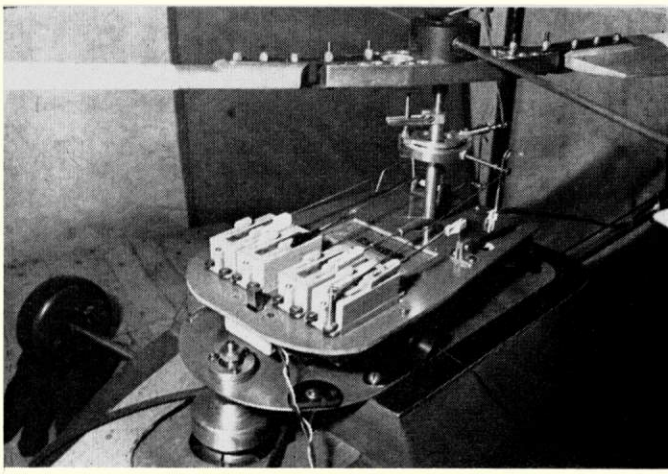
Using the keel as a template, cut out the $\frac{1}{4}$ in. sheet cheeks allowing about 3/16 in. surplus along the straightedge to accommodate the cross-section curvature of the tube. Glue the cheeks to each side of the keel and when dry shape the pod using the tube as a sanding block. Gouge out sufficient material from the centre line of the pod to accommodate the towhook. The towhook at this stage should only be partly bent to shape so that the portion of the wire which forms the outside of the hook is still straight. Epoxy the pod and partly bent towhook in place on the tube – the strength of the joint is improved by roughening the gluing surface of the tube with a file or rasp beforehand. Now carefully complete the bending of the towhook and solder the small brass shim to it. Epoxy the wire mount in place and then finish the pod to a streamlined shape. Mix some more epoxy, and using the forefinger, smear it along the joints between the pod and the tube, plus the pod and the wing-mount to form generous fillets. Epoxy the wing fixing dowels, the U-shaped aluminium tube and the vertical aluminium tube (which takes the towline pin) into place. Epoxy the hardwood plug into place in the tube at the front of the fuselage and pour in molten lead to form the nose weight. Cover the pod with lightweight or Jap tissue and give four or five coats of dope. Assemble the fin, cover with lightweight or Jap tissue and epoxy it to the fuselage. Finally add the tailmount. Install the timer in the pod and connect up the nylon on/off line through the U-tube to a small ring, with the towline pin in the vertical tube against the length of the nylon so that the timer is in the switched off position. Do not use knots in the nylon but instead use a short length of aluminium tubing which is slid over the nylon crimped with pliers. Now drill a 1/16 in. diameter hole just aft of the U-tube on the fuselage to take the control line wire auto-rudder line. Drill a similar hole about 1 in. in front of the fin on the top of the fuselage. Solder one end of the A/R line to the small ring and bend a small right angle about $\frac{1}{8}$ in. high at the other. Pass the A/R line down the fuselage until the small vertical length is adjacent to the rear hole. By twisting the line from the front the A/R ring should pop through the rear hole and it may then be connected to the fin. Finally drill a small hole to take the nylon D/T line and slot it down through the tube and adjust its length to give a 60 deg. D/T angle. Add a snuffer tube where shown on the plan if a fuse D/T is needed in addition to, or instead of, the timer.

Assemble the wing and tail on the fuselage and adjust the noseweight by drilling holes down its axis until the correct C.G. is obtained. If by some chance the tail is too heavy then extra lead may be epoxied into the front of the pod. Complete the model by filling in the nose with *Plastic Padding* or *Cataloy*, finishing to a smooth, streamlined shape and painting the front end of the fuselage to choice.

Now for trimming. Firstly check that the wing incidence, centre of gravity, and wing warps are exactly as per plan and that all surfaces line up correctly. Secondly be patient and wait for a calm day. Thirdly, for *every* trimming flight use the D/T.

Start off with about $\frac{1}{4}$ in. offset to the right on the auto rudder and test glide. Pack the tailplane and adjust the auto rudder until a long flat glide with slight right turn results. Using about 80 ft. of towline, slowly tow the model up. If the model tows off to one side and will not pull round, file away about 1/16 in. of the brass shim on the towhook and try again, which is equivalent to moving the hook forward. If the model tows off to one side but will pull round, then use rudder offset to straighten the tow. Keep on moving the hook forward and adjusting the autorudder settings until a straight, slightly weaving, tow results. Repeat now with full towline length and make any final adjustments necessary to obtain the optimum tow. Final adjustments to the glide turning circle and glide itself are made over several more flights, where several infers any number between six and sixty!

Above: Bob Agnew, who recently wrote a series on R/C 'copters in R.C.M.&E. magazine, with quite elegant homebuilt. Below: Judges Maynard Hill and Dieter Schluter instruct D. Evans prior to flight with Schuco Hueycobra.



Above: Rotor-head layout on Flt. Lt. Jackson's homebuilt machine. He's full-size 'copter instructor. Below: Maynard Hill and Dieter Schluter examine contra-rotating rotor machine by K. Sinfield. Won special innovation prize.

CHOPPERAMA

a quick look at the hard-ware to be seen at the first ever rotary winged rally, held at the highly successful R.C.M.&E.

EXPO '73

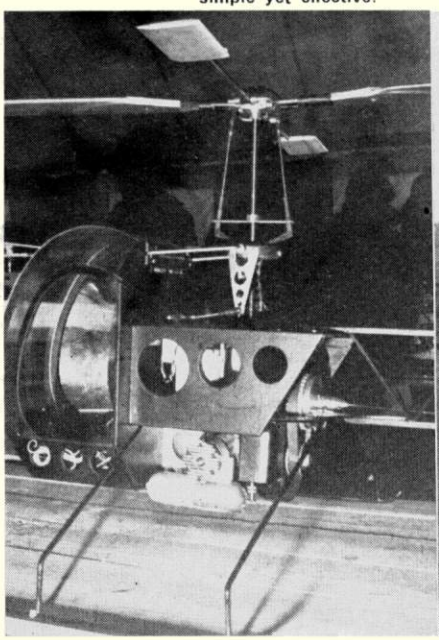
Sywell, Northants.

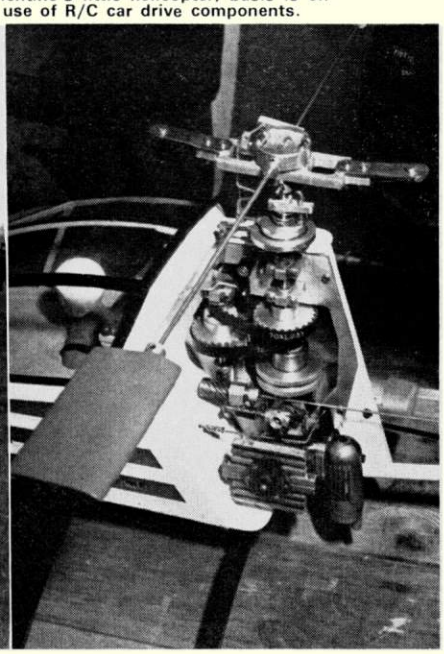
April 22nd-23rd

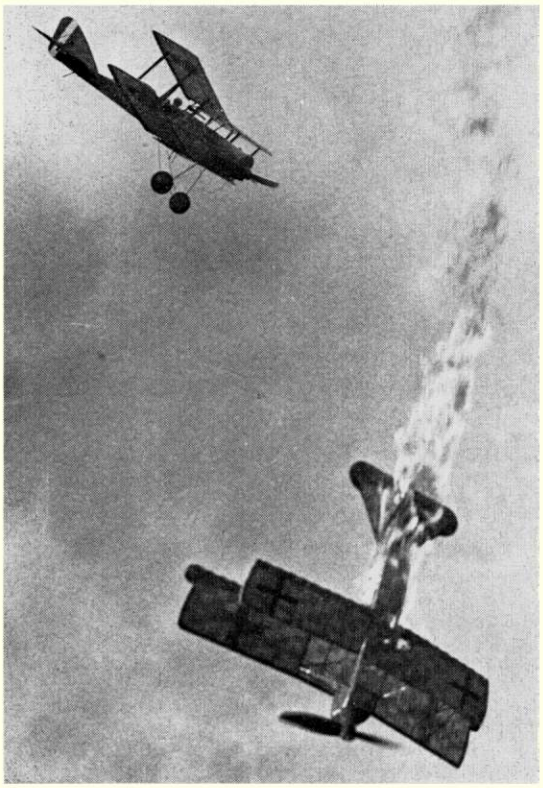
Demonstrated during the weekend were Dieter Schluter's DS-22 (on ground) and the Graupner Bell 212 (airborne) both of which flew very well in strong wind.

Below: Winner of home-design category, Bell 47 style machine by J. B. Morley, simple yet effective.

Below: Main drive mechanism of Peter Valentine's little helicopter, basis is on use of R/C car drive components.







Fine piece of trick photography. Panel Ventruba's Fokker D VII is shot down in flames by Tone Heinl's Martinsyde Elephant. Never realised that the Elephant was such a potent machine!

FLYING SCALE COLUMN

by Eric Coates
photographs by
Lubomir Kounty

LAST MONTH I devoted a large part of the 'column' describing the S.M.A.E. Meeting for Indoor Rubber models held at Brize Norton. Whilst it would appear that rubber is making a comeback after over two decades of neglect, it evidently has been very much to the fore in Czechoslovakia for many years past. I am indebted to Mr. Lubomir Kounty of Brno for the following details which make an interesting comparison with the way S.M.A.E. events are run. One factor which must make a tremendous difference, however, is that being so far from the sea and the endless procession of climatic depressions which we endure from the Atlantic, Czechoslovakia enjoys long periods of continuous calm weather in common with all of Central Europe. This enables outdoor rubber-powered scale competitions to be organised without the 90 per cent chance of it being ruined by the wind as would be the case in the U.K.!

The lack of constraining walls enables a larger scale to be used than is usual for indoor flyers. The Czech regulations call for all competition models to be built to a common 1/20th scale, which results in most popular single-engined subjects having a wingspan of around 20-24 in. Propeller diameter is limited to 35 per cent of wing span and up to 19 per cent variation of dimensions is allowed, if desired, to improve stability.

A rather complex system of scoring is used summating appearance and duration points. Static marking assesses accuracy and craftsmanship while a complexity factor is also brought into the judging to even up the chances of the more difficult prototypes such as twins and biplanes. Again the flight score is factored in proportion to the span of the wings. Altogether the method of marking is much more sophisticated than the S.M.A.E. schedule for indoor scale, and I find this all the more surprising in view of the opinion of the fellow countryman of Mr. Kounty – Jaramir Schindler, 1973 Chairman of the F.A.I. Scale Sub-Committee, who considers the F.A.I. Scale Schedule,

The Yak 3 built by Lubomir Kounty himself, and held aloft by son Petr. Model has a duration of 35 seconds from a proper ground take-off.

At right, Sedlar's superb DH2 is rather restricted on performance, averaging just over the quarter-minute mark – still good enough for S.M.A.E. rules. Below, Lev Pardera with a very fine version of the B.E.12 which makes flights of around 50 seconds.

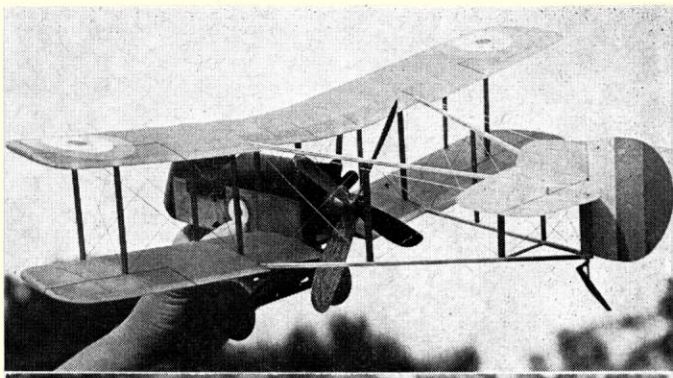
for R/C models, too complex and would like to simplify it to something like Class 2 rules. It would not appear logical to have simpler rules for R/C than rubber-powered free flight!

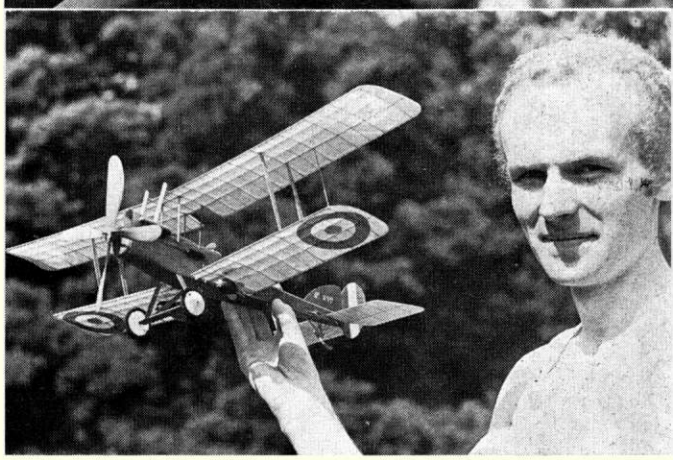
There is no doubt that these Czech rules work though; as can be seen from the great variety of different types of aeroplane in the accompanying photographs. A much wider spectrum than we ever see at a U.K. free-flight event, indoors or out! All the models appear to be of very light construction—the absolute minimum of coloured dope has been used. The emphasis is definitely on duration at the expense of scale appearance—hence the rather stark stringer construction being prominent although the standard of construction is apparently very high. Think of the hours of painstaking work Karel Ludoik put into his *Westland Welkin* (Karel was the winner of the Czech Championship for this class of model last year), the Welkin being capable of flights greater than 60 seconds duration! High flight times appear to be the order of the day in these competitions for the *Yak 3*, built by Mr. Kounty himself, is capable of a regular 45 seconds. Mr. Kounty's wife Eva is no slouch either when it comes to scale models, judging by the *Morane N*, a machine capable of turning in 50 seconds.

Perhaps if the weather is kind at the Old Warden Scale Meeting on June 17th this year we may see something like these Czech competitions on English soil, there are plenty of rubber models around.

AND NOW FOR A STICKY SUBJECT

I suppose that apart from electronics and the wonders of control for models that industry has brought about, for those of us who care to take advantage of them, modern technology has benefited the scale modeller most with the rapid advance in adhesives. Since I dwelt on this subject briefly during my *Flying Scale Models* series two years ago, several more advanced adhesives have appeared on the market—in particular rapid setting epoxies have improved enormously and now we have the cyanoacrylates, but more of these later.





Kounty's wife Eva built this Morane N – and what an ideal subject it makes for rubber power as well. At the last contest it recorded flights of over 50 seconds.

In my last treatise on adhesives I stated that twenty years ago there was virtually one universal adhesive available to aeromodellers of all denominations (there weren't so many denominations 20 years ago, which wasn't such a bad thing either!). This was, of course, cellulose balsa cement. Today balsa cement is still with us and is probably still the most convenient adhesive. I suppose its convenience of handling and relative cheapness still makes it the most popular all-purpose glue. In the majority of spheres, however, it can now be surpassed by one of the specialist adhesives, although none of these later adhesives has the all-round usefulness of the old tube of cement. One can regard balsa cement as being the 'Jack of all Trades' adhesive and 'Master of None'. In order that some of our less experienced readers may understand where and when to use these 'Master' adhesives I intend to devote the remainder of my allotted space this month to this subject. Naturally the following is tilted towards scale model construction but, of course, a lot is also applicable to other forms of aeromodelling.

The scale model with its many highly stressed joints, relatively small section scantlings and diversity of materials requiring bonding together, generally needs the strongest possible glued joint. In the days of balsa cement only it was often necessary to resort to mechanical means for making a lot of these joints – binding of metal to wood parts with thread was essential, assisted with liberal quantities of cement, of course, while nuts and bolts had to be used in much greater

The Savoia Marcheti by A. Pospichal is not an attractive subject nor particularly ideal for free flight, but you must admit it's a real challenge! Not surprisingly, flight performance is far from exceptional, but certainly impressive.

numbers than today. Modern adhesives enable stronger joints to be made in a mere fraction of the time and usually much lighter, too.

Balsa cement

When used for gluing our staple diet, i.e. balsa wood, this glue has two major faults: (a) unless precoating the two pieces of wood to be jointed together is carried out, a rather weak joint is achieved; (b) it shrinks rather a lot when setting, therefore serious warps on light structures, such as indoor scale models, can take place even prior to covering. However, unless the area of glued joint is relatively large it will set fairly quickly—too quickly for large areas of sheeting. When set it is fairly hard and will allow sanding of the structure without clogging the sandpaper and, being in effect thick dope, balsa cement is ideal for structural repairs, readily adhering to doped surfaces.

P.V.A. or White Glue

This has been with us since the late '50s and can be regarded as complementary to balsa cement as a general purpose structural adhesive. Somewhat slower drying than balsa cement, it does not, however, require precoating to make a reasonably strong joint. Therefore it is, in fact, quicker working even though the structure requires pinning down for a longer period. It is the ideal adhesive for gluing sheet on to an open structure as you have plenty of time to coat the whole structure and pin the sheet down before it starts to set. It is much stronger on hardwoods than balsa cement and should always be used on spruce longerons and spars. It does not shrink when setting and, therefore, is far superior for lightweight structures. Being water based, however, it does have some disadvantages, the first, naturally, being that it is not waterproof although for model aeroplane use beneath a dope covering this is hardly of any concern. I would not recommend it for flying boats! It does not stick readily to doped surfaces, however, and therefore is not recommended for crash repairs.

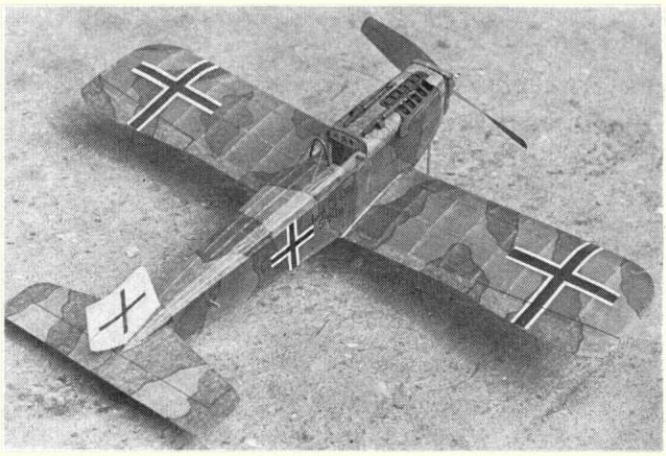
Epoxy Resins

It is in this field that I feel the great advances in adhesives have been made. In the late '50s *Araldite* came on to the general market although it had been used within the aircraft industry for a decade or so before. For the first time aeromodellers had a satisfactory method of bonding metal to wood, and the hours of tedious binding could be swept aside for good. Biplane cabanes were no longer the nightmare of knitting, crocheting and swearing we aged sweats had known of old. Strange though, some people even to this day haven't realised the benefits of epoxy adhesives. You still see plans published calling for items to be 'bound securely' and cemented when epoxy would do a better job in one per cent of the time.

The problem with Araldite and its later contemporary epoxies was that they took about 12 hours to set and several days to fully cure. This meant that all the epoxying jobs had to be saved up to near the end of the session and then all glued together and left to set overnight. One therefore tended only to use it where it was essential and use other adhesives if one could get away with them. A typical case in point being the engine bearer-former joints. Epoxy is ideal for this purpose being immensely strong and completely fuel proof. P.V.A. or balsa cement will both do the job, but nothing like as well.

In the late 'sixties some rapid-setting epoxies of American origin appeared on the market and, frankly, I was disappointed with their performance. Although they were satisfactory wood glues and enabled rapid field repairs to be carried out, their metal to wood and metal to metal strength I found to be very poor indeed. I used these glues extensively in the structure of my *White Falcon* and suffered many metal-wood glue failures when trimming, which had to be remade with 'traditional' epoxies. In the past year or so several British-made rapid-setting epoxies have appeared on the market and these seem admirable. In general these adhesives will set in about five minutes and appear to have completely cured in about 12 hours. I have found their strength to be apparently as good as slow setting, although not quite so hard when cured, but have not actually seen any comparative tensile figures. They are streets ahead of the early American

Junkers DI by Karel Ludvik flys as well as it looks – and that means it's a great performer! Flown indoors, flight times of around 40 seconds can be expected. Karel won the rubber scale class at the Czech National Championships last year.



Another of Ludvik's delightful scale models – this time the Westland Welkin – note the workmanship which must have gone into this model. Flights of around 60 seconds are made – and this is a twin!

glues anyway. The DH9a was stuck together in all the highly stressed regions with these glues and it has not suffered any structural failure yet despite one or two good 'thumps' whilst trimming!

Because one can stick virtually anything together more quickly and strongly using rapid-setting epoxies one is tempted to use them for virtually every job whether it is necessary or not. The only drawback would appear to be the price and the inconvenience of mixing a new lot every few minutes. I think there must be a weight penalty also although this would only be slight. If there are any modellers who have not tried these adhesives yet I would advise them to invest in a couple of tubes; they will be amazed at the performance.

Contact Adhesives

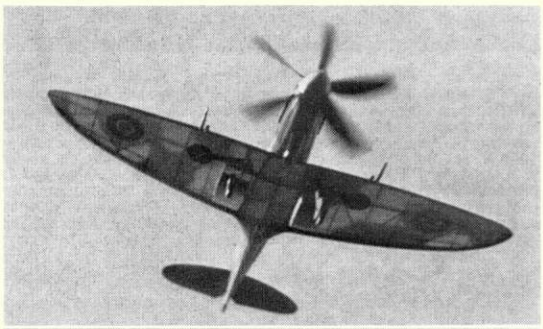
These have been around for about 30 years. They are, however, much cleaner working these days than back in the 'forties. I wonder how many older modellers can remember being *'clarted up to the eyeballs'*, to use an old Yorkshire expression, with 'Black Bostic'! Modern clear contact adhesives are altogether a different proposition although I personally only use them for attaching metal panelling over balsa sheet and fastening details. It is essential to dope over such work afterwards as in time diesel fuel will attack the adhesive causing it to go 'slimy'.

Cyanoacrylate Adhesives

The 'super' chemical adhesives are the latest to reach the British market, and some are now available through the model trade. These vary in types – some are 'one-shot', others two part. I have no direct experience of the single pack variety, although understand that they are good provided that the surfaces to be joined are scrupulously clean, and that the setting time varies from a matter of seconds to several minutes depending on the materials concerned. The liquid is very thin (indeed water-like), and a little drop really does go a long way, although this adhesive is not suitable for use on wood or other porous materials. The variety which I have used has only recently been introduced for engineering applications, and may not be on general sale as yet. This is a two part adhesive but the two parts are not mixed. The adhesive, which is supplied in a small plastic bottle, is applied thinly to one surface whilst the surface to which it is to be bonded is sprayed with the activator; which comes in the form of an aerosol. The two surfaces are brought together and the bond achieved in a matter of seconds – so fast in fact that unless you locate the two parts correctly the first time you have 'had it'. It is almost impossible to prise them apart afterwards. A word of warning here, if the fingers are inadvertently bonded to the job, similar difficulty will be encountered and virtually a surgical operation is required to separate yourself from your beloved model – so beware! These adhesives are not cheap: 20 grams of adhesive plus a 180 c.c. aerosol of activator will cost you the topside of £3 from trade sources. I cannot see this form of glue replacing balsa cement as an all purpose adhesive overnight, but I do foresee that they will have great uses for highly stressed parts which offer very little gluing surface; particularly metal details on scale models.

One function that I have found cyanoarcrylates will do, which no other adhesive can accomplish, is to butt joint section rubber to form tyres—at last one can tailor make that tyre for a scale model. I have tried many adhesives for this purpose over the years and never yet found a satisfactory one. Contact adhesives just do not have the strength; they seem to work for a time, then one day when your pride and joy is making a perfect 'booler' on the runway the darn thing parts company and uncoils itself, causing the model to nose over as usual.

I hope the foregoing will give some idea of the great strides the glue factories have made in the past couple of decades and may tempt the *'I use balsa cement for everything'* brigade to have a dabble at what modern technology can offer them in 1973.



If it wasn't for the transparent wings, Hubert Pernica's Spitfire XVI (top right) could be the Griffon powered original of thirty years ago. Likewise, Lev Pasdera's Fieseler Storch (right) coming into land after a minute's flight is most realistic.

AMSTERDAM CUP
being sub-titled
BRITISH MODELLERS GO DUTCH!

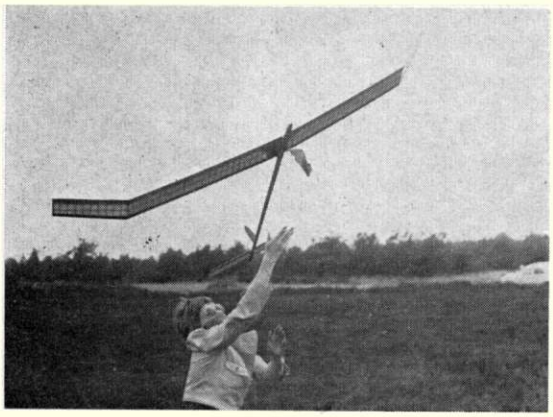
by Martin Dilly

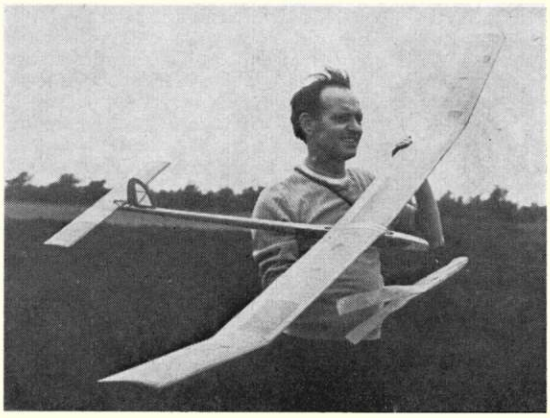
THE RECENT British interest in attending FAI free-flight contests on the Continent has been gaining momentum and at the Coupe d'Amsterdam, held near Arnhem in the Netherlands on May 19th and 20th there were 12 participants from British clubs, out of the total of 71 who flew. Other countries represented were West Germany, France, Belgium, Luxembourg and, of course, the host country.

The contest, an open International on the FAI calendar, and therefore open to anyone holding a current FAI Sporting Licence, was held at Rozendaalse Heide; this is a large area of heathland in one of the few hilly areas of the Netherlands, rather similar to a smooth Chobham Common, covered largely with short heather and criss-crossed with sand roads, normally for cyclists and 'brommas', the rather appropriate Dutch word for mopeds. The sandy vegetation produces fairly frequent areas of lift, no doubt welcomed by the pilots at the National Gliding Centre at Terlet, a few miles away.

As regards the organisation, this was carried out by three hard-working people from the **Amsterdamse Luchtvaart Club,** and there was a shortage of timekeepers throughout the contest; sensibly enough there was no insistence on the use of two timekeepers and binoculars were not employed, but at times the lack of another pair of official eyes led to a number of unfortunate errors. However, the whole atmosphere was most friendly, the organisation did what it set out to do, and, although there were neither line

Above, Hans Schallenberg placed third in the power event which was contested solely by West Germans armed with highly-tuned (overtuned?) Rossi 15s. He had a most rewarding time at the competition as he also won the Wakefield event with a perfect score – the only person to do so in that event. Below, rather a hairy launch for Pinther's A/2 provided by his sister. Below right, John Woodhouse of Croydon waits for lift with Jack North's sparless winged A/2 class glider. Jack was evidently unlucky, placing an eventual 40th.





Ernst Borczewski makes a stylish launch with his neatly constructed Wakefield.

checks nor model processing as far as could be ascertained, no protests were made. For the first time at this contest there was a tailless event and while only four flew in this the organisers knew of the nucleus of British tailless enthusiasts and hoped that next year there would be a strong British representation in the class.

The British travelled in four groups, Jim Baguley, Paul Masterman and Martin Dilly coming by car and the Harwich to Hook of Holland ferry in a force 7 gale, which while involving a night crossing, also allowed a clear day in the Netherlands before the contest started at noon on the Saturday. Phil Ireland, Pete Stewart, Gary Madelin and Alan Jack barely made it in time, having had a hectic overnight journey after driving from Southampton to Dover as soon as Gary had finished an exam on the Friday night, only to be delayed in mid-Channel while the Ostend ferry made a search for an involuntary Channel swimmer.

On the first day the system was to fly all the classes together in two hour rounds; the weather was hot and breezy with strong lift, and most of the A/2s managed to max without difficulty. Only the British were using bubble generators, four specimens having been imported for the occasion, and apart from a few aluminised Mylar streamers, nobody else appeared to be using any thermal detecting equipment. In fact, on the second day, due to a combination of a change of launch area to the windward edge of a shallow plateau, which produced a certain amount of curl-over in the gentle wind, and because one of the bubble machines was too low to clear the ground turbulence, at least one of the British A/2 flyers was letting the opposition tow on the strength of bubbles before launching his own model into the thermals they thus marked.

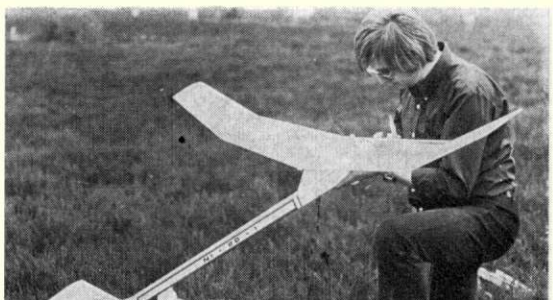
Jim Baguley, John Woodhouse and Martin Dilly all maxed in the first round, Dilly losing his brand new Dvorak-winged model on its first contest flight when it D/Td upwards in strong lift and vanished in company with a soaring Goshawk and a K-7 from Terlet. Later in the day a Cessna 172 was called over by the organisers to help locate lost models, apparently unsuccessfully, but the following day the model was returned from the wilds. Paul Masterman was less fortunate and lost a Wakefield after a D/T failure.

In Wakefield the British suffered from a large number of blown motors; Alan Jack flew well and was in second place, 17 seconds behind the winner, until the sixth round where a combination of bad luck and British honesty struck. After a poor launch his model stalled on the climb to land at around a minute and a half, but on his return the flight had been recorded as a max. He queried this and was given the choice of either taking the timekeeper's word for it or else having the flight again; honesty prevailed (his second mistake!) and the resulting flight produced another minute and a half or so, putting him out of the running. This turned out to be due to the tailplane having ridden up on the D/T bands, the resulting reduced tailplane incidence doing the model's stall recovery no good at all.

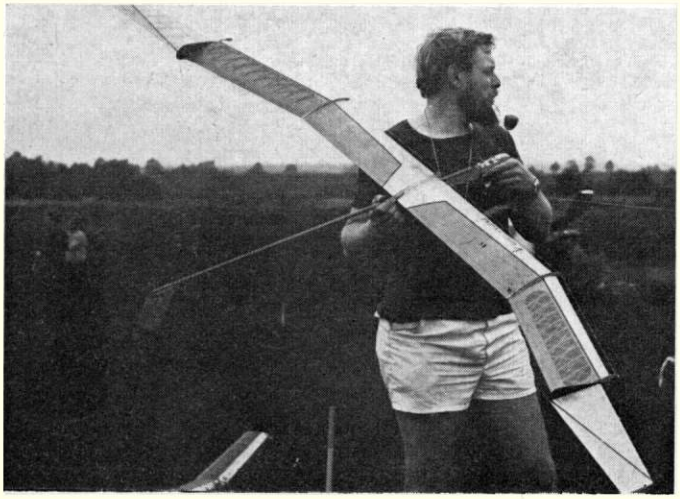
Returning to a more chronological order, the second round had less wind and a duller sky, but again lift, while requiring patience to find, was there in appreciable quantities. The Dutch A/2s with outrigger elastic turbulators, clearly audible in flight, humming like telegraph wires in the breeze, were being matched by the Germans, mainly flying models with tapered wings of a fairly high aspect ratio, but in round three maxes were much rarer in all classes and this round was the decider, certainly in the case of A/2. Jim Baguley's model turned a little too wide to centre into the weak lift and only made 107 seconds, Dilly presumably launching nearer the centre, and now using an elderly model badly damaged the previous weekend at Elvington, eventually hitting a bush at 152 seconds. Being uncertain of the weather for the remaining rounds it was decided to continue flying this model in order to have the option of later using either a windy weather or a still air model should the conditions change.

In the event, after some overnight rain which quickly drained away into the sandy soil at Rozendaalse Heide, the second day produced rather more stable air, rounds were reduced to 1½ hours each, and it became obvious that it would be necessary to return a max or very close to it on each flight in A/2 merely to retain one's place in the top ten. There were further timekeeping discrepancies, one of Ian Kayne's Wakefield flights having been either mistimed or mis-recorded, and Dilly's fifth A/2 flight appearing as 170 seconds after D/Ting at some 3½ minutes at approx. 50 feet. In fairness to the organisers, they were suffering from a lack of man-power and were happy to let anybody time a model and reduce the queue of competitors. It was unusual for someone used to the British separation of interests to find himself being timed by an R/C aerobatic flyer, although this is far from rare in a number of other European countries where perhaps clubs are larger and free-flight specialists count laps at team race events and scale flyers are to be found downwind helping in model location at free-flight contests. Jim Baguley in Wakefield and Jack North, Gary Madelin and John Woodhouse in A/2 decided not to fly after disappointing performances on the first day, and together with Phil Ireland who cracked wings while trimming his Power model, and John Mabey who broke two Wakefields in the first round, helped the rest of the British.

Power was notable for the fact that all who flew were West Germans, mostly from the Nord Rhein-Westphalen area clubs, and also for the appreciable number of Rossis that either blew up or seized, perhaps as a result of having been tuned to too high a degree for their own good. Richard Schley's Rossi slowed from peak r.p.m. to about 10,000 and then stopped; after finding that his electric starter wouldn't turn it, inspection showed the piston to have seized in the top of the bore. Gerhard Heidemann, from the Celle club, had a con-rod break during a ground run, the resulting sudden halt removing the spinner and the prop, the latter taking a good five seconds to return to earth.



Reinhard Friedrich with immaculate Rossi-powered all-sheet model, featuring wings that plugged into a stub centre section, with a rather high aspect ratio. Model used a radio-location oscillator in fuselage.



Pieter de Boer of Hengelo club with tail-less A/2 by fellow Dutchman Gerhard de Kruiff from Deventer.

The Celle models had high-mounted tailplanes, all-sheet flying surfaces and twin pylons; in some cases the two-piece wings were held together with bands running fore and aft through short lengths of light alloy channel epoxied on the upper part of the trailing edge, to act as a key that is flexible under shock loads. Reinhard Friedrich had a pair of immaculate models with a rather higher aspect ratio than is current in Britain, but demolished both Rossis and models in a couple of hours, in one case after developing flutter and demolishing itself in the air, the resulting garbage disclosing a neat radio-location beacon, several of which were in use by the Germans, one of them in a Wakefield; these give a range of several hundred yards on the ground and more when the model is 'tree-ed'. The Germans also had a number of family teams, usually with father and son flying and with mother or sister actively helping, operating walkie-talkies, waiting downwind to recover models or timing, this sadly being a rare exception here in Britain.

Only two people had seven maxes, Hohls of Germany in Power and Scallenberg, also of Germany in A/2; the contest was over by 4 p.m. in order to allow people to export themselves to their own parts of Europe again and certainly the majority of the British contingent felt it was one well worth returning to next year. Getting along to an event of this kind would certainly prove an eye-opener to those who seem reluctant to get involved in contest flying because they feel 'it isn't fun any more'. Those of us who could barely see each other across plates piled high with food at one of the local Indonesian restaurants after the flying was all over (including pancake rolls nearly a foot long and about 3 inches in diameter) might well be prepared to go again on the strength of that alone; the entry fee included a good dinner at a local restaurant, as well as a packed lunch, the roads are good and English is almost a second language in the Netherlands, so why not come along in 1974 and find out how enjoyable a contest can be?

RESULTS

Class F.1.A (A/2 Glider) 43 flew. 1 Schallenberg (W. Germany) 1260, 2 Wilkening (W. Germany) 1243, 3 Mohr (W. Germany) 1231, 4 **M. Dilly** (G.B.-Croydon) 1218, 8 **J. Baguley** (G.B.-Hayes) 1187, 12 **P. Stewart** (G.B.-Crookham 1114, 28 **J. Woodhouse** (G.B.-Croydon) 971, 40 **R. J. North** (G.B.-Croydon) 646, 41 **G. Madelin** (G.B.-Crookham) 598.

Class F.1.B (Wakefield) 14 flew. 1 Croon (Netherlands) 1210, 2 Lefeuvre (France) 1181, 3 de Ruyter (Netherlands) 1178, 6 **A. Jack** (Southampton) 1109, 7 **I Kaynes** (Croydon) 1078, 10 **P. Masterman** (Anglia) 1028, 11 **N. Elliot** (G.B. – Croydon) 950.

Class F.1.C (Power) 10 flew. 1 Hohls (W. Germany) 1260, 2 Heidemann (W. Germany) 1222, 3 Schallenberg (W. Germany) 1214.

Tailless (4 flew). 1 Peper (W. Germany) 693, 2 F. Jandt (W. Germany) 584, 3 P. Jandt (W. Germany) 446.

READERS' LETTERS . . . .

Dear Sir,

Sitting on the beach and enjoying the sun and an otherwise enjoyable May edition of **Aero Modeller,** I was astonished at the unfair and ill informed comparison's made by John O'Donnell after eulogising two indoor competitions held in the North West area. He then went overboard and said in effect that the indoor fraternity at Cardington and Brize Norton suffered from apathy.

To put the record straight I would offer the following facts:

Brize Norton is the best 'Winter' indoor site in the South available by 'invitation' of Butch Hadland and the R.A.F.M.A.A. from whom permission to fly should be sought.

The current top time is 15:42 and several of our best **Easy-B fliers** have beaten 10 mins!! Some of the N/A fliers mentioned in the article came to Brize Norton and through willing help and advice of these derided Southerners, managed to double the previous best flight times of your local experts. We also provided the drawings and materials, plus trimming and flying advice to help them toward success.

Having seen John's microfilm covered 'Wakefield', he could usefully make the trip himself!! As for the apparent lack of comps and publicity for indoor at Cardington, it should be said that as the big hangar is neither lit nor heated, indoor is only practical during the summer months. We try to fit in the meetings there in-between official S.M.A.E. F/F comps, so we have to wait for the competition calendar to be published, which is usually January/February. Having found our dates, we then have to apply to the owners for permission (with specific dates), and this year it has been complicated by a change of 'owners' and insurance problems. By the time this procedure is complete it leaves little time to organise and publicise competitions, however at least the dates **are** shown, and if any comps are in demand we would be pleased to run them.

As for John's well-known advocacy for World Championship trials to be held just before the event, this **may** suit those whose models are rough, but always ready! However the provisional dates for W/C trials in Cardington are scheduled early mainly because of the probable erection of large racks, 'sometime' later in 1973 and the desire to have the best possible conditions for this important event. The U.S.A. tried democratic voting for Trials venues and it results in farce and rancour.

The short time between last year's Trials and the W/C at Cardington (with all the other attendent organising responsibilities) directly resulted in the problems I had during the W/C, and this experience suggests we should try the longer interval alternative.

Most of John's column is interesting reading and good for F/F in general. However, he too often spoils the effect by 'Personalising' the views, etc. contained therein. In fact, at times it's like a nightmare version of Coronation Street, where every other 'character' seems to be played by J. O'D.!!

He also frequently confuses comment, with abuse of 'officialdom', in the organisation and running of competitions, and yet it is these same people who provide the structure within which he flourishes.

The article he wrote on the indoor W/C 1972 was pretty good, but he did seem to find it difficult to understand how it all went so well! I can tell him it was the direct result of our S.M.A.E. indoor committee — who made the right decisions about the way to run the comp. 'organised' by skilfully persuading the owners of the big shed to remove all the hanging experiments, shut the unshutable hangar doors weighing 800 tons, got most of the holes covered over, and visited the site several times. In the mid-week daytime, 'found' the gas, provided the winches/lines/balloons/scales/wing span measures, etc. Met teams at the airport, piloted them to the correct route, found hotels, collected and stored models and to top it all spent £200 of our own money!! So we know a little about running comps.

If running advertised competitions at Cardington this year **is** the answer to greater use of this oustanding facility we would definitely run them, and we would be pleased to hear from interested parties. This lack of use gives us concern, and we wish it known that **all** comers are most welcome — Scale/Tissue / Beginners / Microfilm, etc. So long as you notify me of your Name/Address/S.M.A.E. No. (and Phone No. if you have one) in advance we will gladly help anyone if we can, and would wish better use made of the site. It could be that some are put off by reports of 30.00 min plus flights, and feel 'out-of-place'. However, the fact is that the welcome is warm and genuine.

Laurie Barr. Chairman S.M.A.E. Indoor Committee.

Dateline Cannes at present(!).
but normally:
4 Hastings Close,
Bray, Berks.

P.S. We have also distributed several thousand 20 page illustrated booklets on the A-Z of indoor completely **FREE** (although unable to afford this any longer), and indoor supplies are readily available at **the same** cost as you can buy them direct from the U.S.A.

FLY THE SCHEDULE!

Jim Mannall, winner of the Gold Trophy for the second consecutive year, passes on advice to help you improve your control-line flying.

The author with his chief supporter and critic (his wife!) plus his 'Nimrod 5' design with which he has notched up so many 'firsts'. Plans of this model are available from the Aero Modeller Plans Service, P.O. Box 35, Bridge Street, Hemel Hempstead, Herts HP1 1EE, as order no. CL1161, price £1.15 including post and VAT.

MANY ARTICLES have been written teaching the novice the elements of aerobatics, but this exposition is intended to carry on where most leave off and thus assumes that the reader is already a reasonably competent flier. What further steps are then necessary to enable him (or her) to enter the competition field?

Beginners often ask *'How do you learn to fly the F.A.I. stunt schedule?'* There is no simple answer except to say *'Study the manoeuvre diagrams in the rule book, then go out and practise,'* but this presupposes that the flier has a suitable model and can fly it with safety. Before being concerned with the schedule, and before building a competition model, it is important to be able to fly inverted with confidence. Understandably, if in trouble the usual 'panic reaction' is to attempt recovery into normal flight but in many cases this is impossible and an inverted recovery, or even landing, is necessary and always preferable to an *unsuccessful* attempt to get the model upright again!

If my own early thoughts were anything to go by, it is a commonly held belief that a competition stunt model is difficult to fly compared with, say, a combat model. Not so! Obviously, there are great differences, but in level flight both are equally easy to fly. To describe a stunter as sensitive to the controls is misleading; the word responsive is a better description. Manoeuvrability available is tremendous, but it is not achieved by sacrificing stability, as is the case with many smaller models. Newcomers to stunt can run into trouble through lack of appreciation of the models' limitations, particularly in square manoeuvres, where they snap on full elevator with the result that the model virtually stops during the turn and cannot climb vertically with enough speed to provide adequate line tension. This situation worsens with each corner resulting in a battle to retain control, the intended manoeuvre being forgotten! The first thing to remember then, is not to try for very tight, square, corners at first. Keep all your manoeuvres fairly large, and above all smooth – no jerky wrist movements.

Choice of model depends largely on the builder's previous experience, but for a first stunter choose the simpler designs; a complicated structure tends to be heavier. Avoid wing-mounted undercarriages as they do not stand up well to the inevitable hard landings and keep the finish light. That super paint job may look good but it can be very heavy – save it for the second model when you have a better idea how much weight can be 'spared'.

Once you have the model flying and feel reasonably confident, take a careful look at the trim. There are two points which require attention for optimum performance and ability to hold line tension. First does the model tend to roll in towards you in upright or inverted flight? This shows up best during high flying when line tension is low. Corrections should be made by twisting the flaps in the opposite direction until any rolling tendency is removed. The other probable fault is that the model may tend to climb or dive in level flight, often accompanied by a tendency to fly tighter inside than outside loops or vice versa. If the model climbs, bend the flaps down relative to the elevators until a 'straight' trim is achieved. Finally, try a wingover as slow as possible. With little or no line tension when overhead, any tendency to roll or veer off is revealed.

Learning the stunt schedule is now largely a question of practise, plus of course determination, concentration, attention to detail and a willingness to learn from others. Above all, do not be disheartened if you do not do very well at first – it is no exaggeration to say that your first competition does more for your standard of flying than weeks of practice.

Careful preparation is essential to give the model the consistency and mechanical reliability necessary if one is to be free to concentrate on flying. The day before a competition give the model a thorough inspection, checking such items as engine mounting bolts, cylinder head bolts, silencer fixing, tank fixing and glowplug condition. Make sure that the fuel system is free from leaks and blockages. A fuel line filter prevents the jet from becoming blocked, but remember that in time it too will become congested.

Arrive with plenty of time for a practice test flight to establish the motor setting, then relax. Always be ready to fly when called – remember that the previous flier may call an attempt. The starting procedure should become routine with everything carried out in a well rehearsed sequence; do not leave too much to do at the flight line. Have the model fueled up before you enter the circle and check items such as prop nut tightness, wing bolt security etc. My own procedure is as follows:

Before entering the circle (while preceding competitor is performing) reel out the lines and check all connections and the handle adjustment. Check wing bolts and cowl for tightness. Check propeller nut. Remove vent plug, fill tank and replace plug. When called upon to fly, enter the circle promptly, check wind direction and position of the judges, and place the model at the selected starting point (more on this later). Position the accumulator/toolbox behind the model in a convenient place for when model is inverted for starting. Check that the judges and timekeeper are ready. Remove the tank vent plug and top up the fuel to ensure the tank and engine feed pipe are full (the pipe tends to drain if the model is left standing). Invert the model and with your assistant holding it, prime the motor. Flick the propeller several times until the motor is freed up and feels 'right', then connect the accumulator and check the circuit. I use a testing circuit which includes a 2.5 volt torch bulb, but an ammeter may be used instead. A bulb limits the current through the circuit and a switch is used to short circuit the

Bob Gieske, a top American pilot, with his famous modified 'Nobler'. The 'Nobler', a really classic model, is one of the few true contest designs available commercially as a kit, and could hardly be bettered as a first 'serious' stunter.

bulb for starting. Switch on and turn the engine over holding the propeller, feeling for a 'kick' as the piston passes the top of its stroke. Now signal to the judge/timekeeper that you are going to start and make sure that the signal is received – flick the propeller, and with luck the engine will start first time.

With the model ready for take-off, check the connections at the leadouts before *walking* to the centre. Check the handle connections and try the control movement before signalling for takeoff: your assistant should not release the model until your hand falls after the signal.

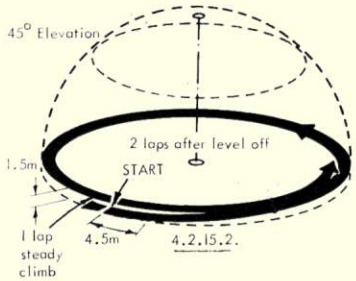
Hand signals should be given clearly and with confidence. Raise the hand above the head for one lap before each manoeuvre. This may seem excessive but bear in mind that between manoeuvres the judges must record the scores. Remember two laps are required between manoeuvres so the model must pass where they are performed (downwind) once before starting the next item. Start the signal three-quarters of a lap after the previous manoeuvre, and finish it after a further lap, leaving a quarter of a lap before the start of the next item. Note that the hand is raised when the model passes the downwind point for the first time, ensuring that the required two-lap interval is maintained.

Choose the starting position with care, especially in windy weather. The accepted position is with the model facing downwind, but this can produce problems with wing mounted two-wheel undercarriages, as the wheels are often further back, causing the model to tip forward in a strong tail-wind. I prefer to place the model upwind of the circle as from this position the model does not encounter a strong tail-wind until its groundspeed is sufficient for the controls to be effective. In addition, weathercock effect on the fin helps to keep the nose pointed outwards on take-off.

Let us now go through the schedule with a detailed look at each manoeuvre. It will be assumed that the model flies anti-clockwise and references to the left and right-hand sides of a manoeuvre correspond to the view seen by the pilot.

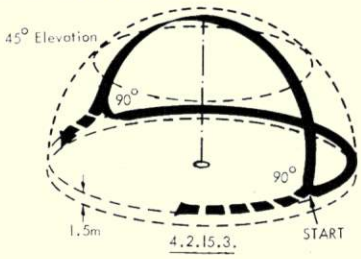
First the *take-off*. With most models a sufficiently long take-off run is obtained by letting the model fly itself off with the controls at neutral. If a tricycle or two wheel wing mounted undercarriage is used, the model may be held on the ground for a longer run, but remember that a smooth lift-off becomes more difficult as the speed increases. Adopting a crouching position with the handle near the ground prevents the inboard wheel lifting too soon. A common fault is too steep a climb; the model should not reach the normal flight level (five feet) until it is over the starting position. The first two laps of level flight also form part of the take-off manoeuvre. Signal during two further laps before starting the *reverse wingover*.

TAKE OFF



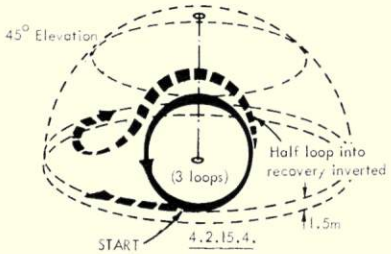
This manoeuvre should be positioned in line with the wind, starting at the upwind side of the circle. The judges should be directly upwind, so use them as a reference to ensure both halves of the manoeuvre are on the same line. Which way should the flier turn as the model passes overhead? Being left handed, I use the following technique: Stop turning just before the start of the reverse wingover and then as the model passes overhead turn *back* (clockwise), continuing to turn with the model during the inverted half lap. Stop just before the entry to the second half of the manoeuvre and as the model passes overhead for the second time start turning anti-clockwise) again, continuing as it recovers into level flight. If you are right handed continue turning forward during the first half of the manoeuvre stopping as the model recovers into inverted flight. Turn back (clockwise) during the inverted half lap, stopping just before the entry to the second half of the wingover. Then as the model passes overhead for the second time turn forwards (anti-clockwise) again continuing as it recovers into level flight.

REVERSE WING OVER



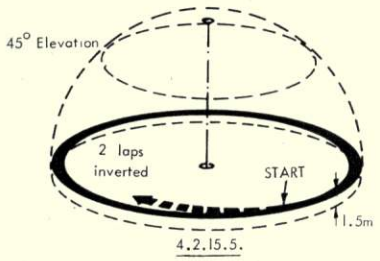
In strong winds it is far easier to start a wingover just before the upwind point is reached, but then the second half is very difficult, if not impossible, to complete. Try to start the first half just *past* the upwind point, then the second half which is entered from inverted flight with the model generally flying slower, will be much easier. The rule book does not define the exit corner radii and it is therefore not necessary to make them very tight. Make them reasonably small, but keep the model's speed up and exit on a smooth recovery at the correct height, especially on the inverted half lap. A common fault is to pull-out too sharp, allowing the model to 'overshoot' the corner and zoom up. A sharp pull-out kills speed which cannot be regained in half a lap, making the second half of the wingover rather difficult! The wingover demands more confidence in the motor than any other manoeuvre, since should it stop or falter during the first few feet of the vertical climb, line tension is lost and recovery is very difficult. . . .

THREE INSIDE LOOPS



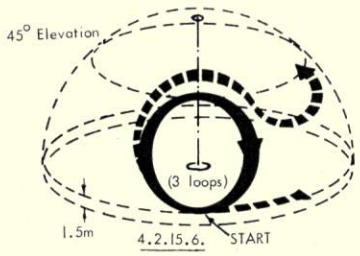
The *three inside loops* which follow are one of the simplest manoeuvres in the schedule, although it is very difficult to score high points for them. An inside loop is generally the first manoeuvre that a beginner learns, and in consequence any errors are established early. To achieve consistently round loops of the correct size requires serious practice with a helper giving a second opinion on accuracy. They should be round with a line angle of 45 degrees at the top, while the second and third loops should be placed exactly over the first. Some models tend to 'walk round the circle' during consecutive loops, or the size of the loops may change as speeds build up, particularly in wind. After the last loop make an additional half-loop into *inverted flight*.

INVERTED FLIGHT



Remember to give a hand signal during the first two inverted laps. The two judged laps should be smooth and level — beware the tendency for the model to drop when travelling downwind. Keep the height at five feet. Count the inverted laps carefully, make sure you have completed two laps after the hand signal before signalling again (two more laps) for the *outside loops*.

THREE OUTSIDE LOOPS



These should be identical in size to the inside loops, again followed by an extra half loop to recover into normal level flight. Some models speed up so much when performing loops in windy weather that the third loop is a trial of strength! This can be eased by looping with the model travelling into the wind at the bottom, i.e. go past the downwind point before starting them, but this does make it difficult to maintain a smooth shape, and there is a tendency to put a 'flat' on the bottom of each loop.

So much has been said about the difficulties of square manoeuvres that the newcomer may be forgiven for thinking that tight corners are all important. Not so: the most common error is to make the corners too tight, forgetting that the model must fly smoothly in 'straight' lines between the corner and to do this flying speed must be maintained. Concentrate on the shape of the figure; get the four sides in the right places and keep it large. With practice, the corners will tighten but they must be smooth. Most important, the model should leave the corner without wobbling or jerking, and should be heading in the right direction with sufficient speed to reach the next corner under control. The actual shape of a square loop is difficult to define. Since the model flies on the surface of a hemisphere, lines which appear straight to the flier are not truly straight and will not appear straight to the judges. A compromise must be made. The two obvious alternatives are:

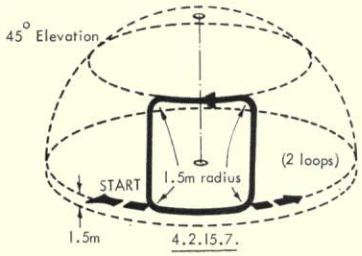
a) A figure in which the four angles are all right angles. This gives a short top leg only 70 per cent of the base length and is not a good solution.
b) A figure with all sides and all angles equal.

I believe the latter to be the best solution, being very close to a true square. Indeed it is found by taking a true square of the appropriate size and placing its four corners on the surface of the hemisphere on which the model flies. It is then possible for the model to fly along four 'straight' lines (as seen by the flier) between the four corners. Unfortunately although this gives four equal sides (actually equal areas of four great circles) and also equal angles they are not right angles, but slightly obtuse. The actual angle area depends on your viewpoint, only the flier sees four equal angles and they are almost 100 degrees. (99 deg. 54 min. for the purists!)

The rulebook definition is very close to the figure just described, the difference being that the top leg is defined as inverted level flights at a constant elevation of 45 deg. The flight path between the top corners is thus not a great circle, and should appear curved to the flier. The two top angles are 75 deg. 26 min. (I know that seems far too acute, but that is how the geometry works out) and the base angles are 99 deg. 54 min. Note that in the ideal figure the elevation is only 45 deg. at the top corners, it increases along the top leg to reach a maximum of 49 deg. 54 min. at the centre of the figure.

Having determined on paper what shape a 'square' should be, how does one put theory into practice?

TWO SQUARE INSIDE LOOPS



Remember that the shape must appear correct to the judges, so you will need a helper watching outside the circle to point out any errors. Plan the whole manoeuvre in advance so that you know where the corners should be. The length of the base gives an included angle at the centre of 45 deg., its midpoint being directly downwind. Stand facing this point. For

Neil Billington was perhaps one of the most improved pilots of 1972 – culminating a most successful year by topping the team trials last September. Success due mainly to constant practice, and determination to succeed.

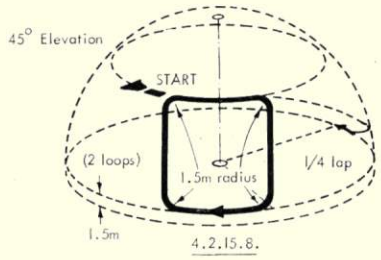
Long a control-line aerobatic enthusiast, though he is also an active R/C competition flyer, Dave Day combined the virtues of two 'classic' models, the 'Spacehound' and 'Thunderbird' to produce a very smooth-flying machine.

the first corner, turn the model into a vertical climb, not too tight, and climb to an elevation of 45 deg. But wait, the top leg must equal the length of the base. Its position should be fixed in your mind and the model should be headed towards its left hand end. So the first corner should have been greater than 90 deg., making the model climb toward a point to your left rather than vertically overhead. Start again, making the first corner 100 deg. and when the second corner is reached notice how the model is pointed not vertically but outwards relative to the centre of the square. Gravity and wind help us round the second corner, too much if anything, so keep the included angle large, much greater than the 75 degrees that is theoretically required. You can afford to let the model climb slightly over the first half of the inverted top leg. The third corner is the tight one, let the model come round until it is pointed inwards, symmetrical with the top of the vertical climb. If you do all this right, the last corner should be greater than 90 deg. symmetrical with the first one. Many people leave themselves too much to do in the last corner, the secret lies in that tight third corner, put more into that and the last corner is much easier. Now the second square loop begins. Is the model still going fast enough? Be particularly careful not to 'overdo' the second corner of this figure or the model will lose height along the top leg and the last two corners will be lost in the rush to get back to normal level flight before the ground swallows up the model!

The square *outside loops* are similar to the inside ones, but start with the model at an elevation of 45 deg. Begin the climb from level flight, three-quarters of a lap after the end of the inside square loops (as your hand signal begins) taking a further lap to reach the 45 deg. elevation. The first corner is equivalent to the third corner of an inside loop and should be tight, the model turning through more than 90 deg. The difficulty now is to remember where the ground is so as to accurately place the second corner – I find it helps to glance back at the horizon just before the first corner. No such problem exists in the second loop as the base line has already been established. Remember that the second loop finished with the model in level flight at 45 deg. elevation. As in the inside loops the corner at the top of the climb should be

One of the best known of all stunt models, the 'Supermaster' designed and flown by Joseph Gabris, certainly amongst the greatest aerobatic pilots of recent years. Plans available from Aero Modeller Plans Service, P.O. Box 35, Bridge Street, Hemel Hempstead, Herts HP1 1EE (order No. CL930, price 60p including VAT and post).

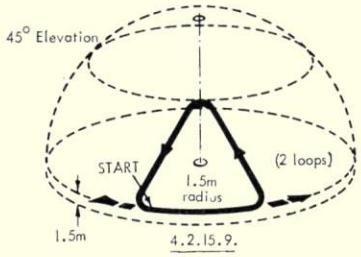
TWO SQUARE OUTSIDE LOOPS



'loose' letting the model climb slightly as it leaves the corner. The rule book calls for recovery within a quarter lap so at the point where the manoeuvre started do an extra 'half' corner putting the model into a 45 degree dive recovering smoothly into level flight at five feet.

The shape of the *triangular loops* can be found by placing the three corners of an equivalent triangle on the hemisphere on which the model flies – three sides of the figure are then formed by equal areas of three great circles. The true angle (again seen only by the flier) at each corner is 67 deg. The angle at the centre of the circle between the two bottom corners is 50 deg. 10 min. Position the manoeuvre so that the

TRIANGULAR LOOP



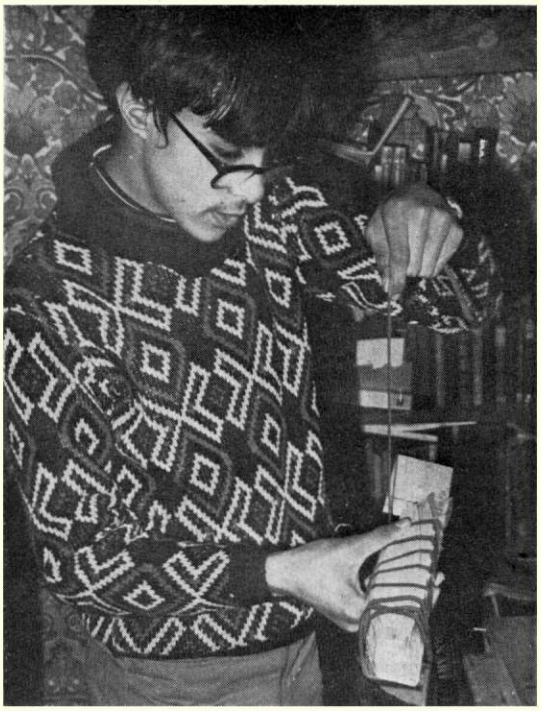
top corner is directly downwind. Do not make the first corner too acute, remember it should be 67 deg not 60 deg. It is remarkable how many people make the top corner very acute. Keep the second corner equal to the first and the last corner should then be correct. As in the square loops, if the last but one corner is right, the last corner is less difficult, although it is undoubtedly more difficult than the last corner of a square loop. I can only repeat the advice given earlier, keep the corners large at first. It is pointless doing a really sharp corner if the recovery is not smooth and at the correct height.

The manoeuvres so far completed comprise the basic shapes used in stunt flying. The second part of the article, next month, will continue through the schedule dealing with the more complicated manoeuvres which are all made up of parts or combinations of these basic shapes.

AIRSCREWS
EN MASSE

by Ron Coleman

PART II – WITH A WOODEN MOULD



The author's son, Pierre, carefully binds a newly-laminated blade to the mould with a length of strip rubber – don't throw away your broken motors, from now on they are still useful!

IN THE PREVIOUS article we dealt with the blade layout, pitch angles and a simple method of making the blades on a tin can, which is a convenient system, but not necessarily the best.

We can now discuss a more accurate mould for forming the airscrew blades, using very similar techniques. Two layers of $\frac{1}{16}$ in. balsa laminated together seem to meet the needs of Coupe d'Hiver models, but for a Wakefield class model or a large Open Rubber job three, four or more laminations might be required, when the project would be of such size and importance to make the design and construction of a really accurate mould very worth while.

It is best to use a mild working hardwood such as Malay Meranti, Chilean Rauli or Honduras Mahogany (from an old piece of furniture!) or good quality red deal and birch plywood – although the mould can be made quite well from a hard grade of balsa wood.

For convenience we will keep the example at 16 in. diameter and 22 in. pitch, when the drawing described in the previous article can be used again (see *figure* 1). The mould itself consists of bulkheads or formers shaped to each pitch angle station, with a thin planking over them to provide the changing contour face on which the airscrew blades are to be formed as illustrated in *figure* 3.

In order to erect the bulkheads on the baseboard so that the blade centre line is straight, it is necessary to carefully plot the shapes using spring dividers to set out the constant height 'H' from the base to centre line, as drawn in *figure 1*.

Using carbon paper, trace out the bulkhead shapes on to 4 mm. plywood – note the grain direction for the centre lamination which makes for ease of sticking in pins when doing the planking (fig 2). Use a coping saw or a fretsaw to cut just outside the line, finishing off down to the line exactly with a coarse glass paper block, or better still use a power driven sanding disc with a sanding table (refer to *Motorised Modelling* March 1972 *Aeromodeller*). Chamfer off the outer corners leaving the centre ply prominent as shown. This allows the planking to fit down snugly to the bulkheads.

Now check that each bulkhead has its correct undercamber curve, blade centre line mark 'c' and an accurate base line with a vertical centre line 'H' at right angles to it, connecting with 'c'. Look at figures 1 and 2: check that each has its station number.

The next step is to glue and erect the bulkheads in order on the baseboard, making the vertical lines exactly coincident with the centre line, and with the middle core centred over the station position, in each case (figure 3).

If the bulkheads have been cut square on the base, they will stand up on their own until set, when small blocks of wood of $\frac{3}{8}$ in. square section, about 1 in. long, may be glued into the angles to reinforce the joints. The blocks could first be glued and pinned with 18 swg panel pins to the bulkheads if desired and then erected on the baseboard.

When all are set, it should be possible to sight a straight line, or check it with a steel straight edge, along the blade centre line at 'c'.

When the centre line registers straight, the planking can begin. A number of strips of deal or hardwood $\frac{1}{4}$ in. wide x 3/32 in. thick and 2 in. longer than the blade should be boiled or steamed for half an hour to make them pliable. These strips can be

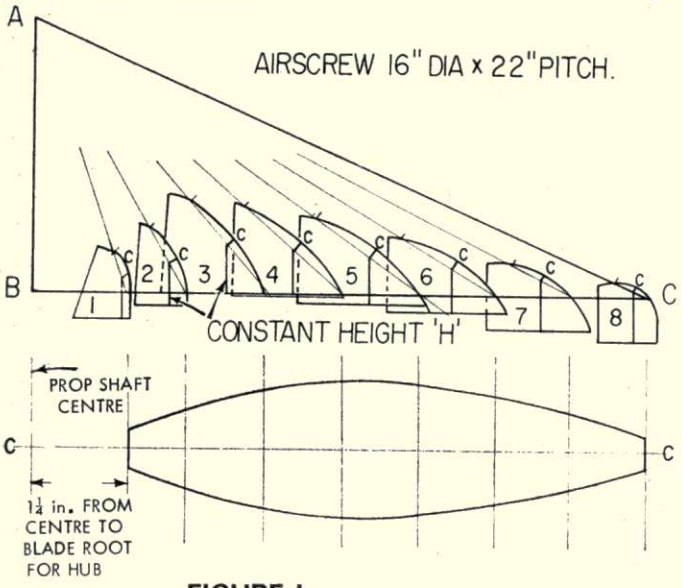
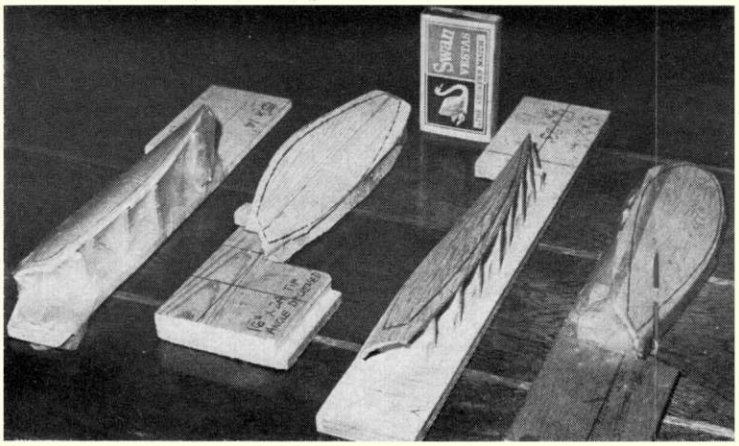


FIGURE I



All tooled-up for mass, mass-production! Just a few of the author's moulds, made using the techniques described, show that with a little pre-planning a vast amount of various blades could be produced during a week of evenings so that the merits, or otherwise, of any particular size/shape could be determined at a week-end flying session.

sawn on a small circular saw from ¼ in. thick wood – if machine sawn there is no need for hand planing, but if hand-sawn the faces will probably need to be planed to accurate width and thickness. Do-it-yourself types should have no difficulty! If the preparation of these planking strips is a problem, try using ⅛ in. sheet balsa, cut into strips ¼ in. wide, these need not be boiled or steamed.

Give each strip a good twist to help conform to the shape, and glue down to the bulkheads, starting at the centre line. Pin each strip down with fine dress-makers' pins, locating the end grain in the plywood bulkheads.

It may be necessary to chamfer the edges of the strips here and there to get a really good fit; any slight gaps will readily fill up with glue. After the planking is complete, coat the whole underside with a liberal application of glue: Cascamite is a good gap filler. Leave for 24 hours, pulling out all the pins.

The top surface will have a number of steps or ridges towards the ends – shave these down with a chisel, or sharp knife, and proceed with the glass-papering. Start with a coarse grade to cut the ridges and excess glue down, then progress to medium, and fairly fine. Use a narrow glasspaper block, with

FIGURE II

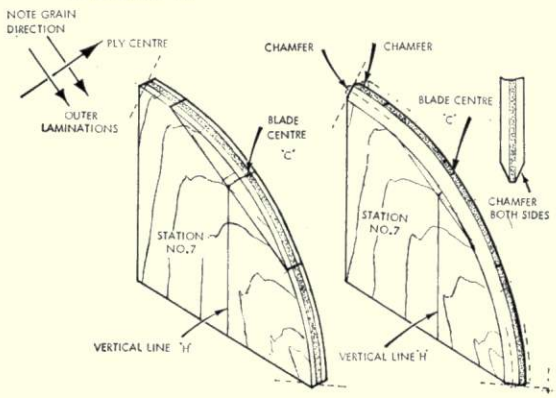
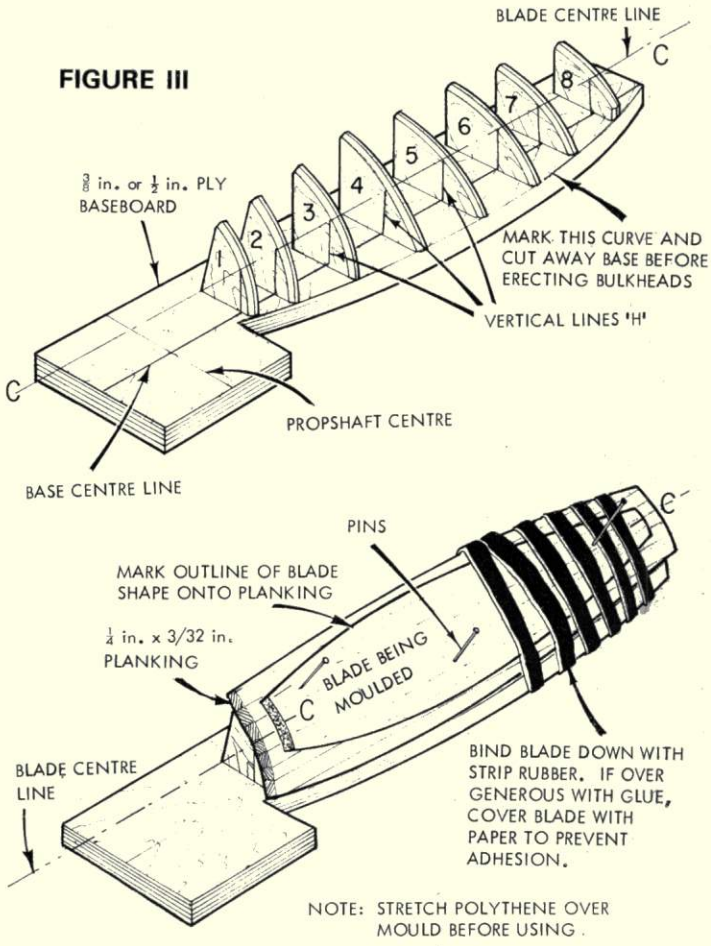


FIGURE III



rounded edges, and as much force as you can muster! You will soon be rewarded by a smooth-flowing surface accurately contoured to the airscrew you have designed. Slightly round off all outer corners.

Now trace and cut out a template of the airscrew blade in $\frac{3}{16}$ in. plywood (it is convenient to write on this template all the data for the particular airscrew) then place it over a sheet of plastic cut from a washing-up liquid bottle, and cut out a plastic template with a craft knife. Mark the blade centre line on it with a ball point pen.

Position the plastic template on the wood mould with the centre line properly aligned and temporarily hold in position with a few pins. Now use a ball point pen to strongly outline the blade shape on to the mould surface. The surface can now be covered with a layer of transparent polythene sheet. Stretch it over the mould so that no wrinkles appear: the edges can be fixed down with an office stapling machine, or held with drawing pins.

Forming the Blades

With the plywood blade template, cut out four $\frac{1}{16}$ in. laminations from balsa, or six 1/32 in. or even eight, etc., depending on the airscrew size and degree of strength and weight required.

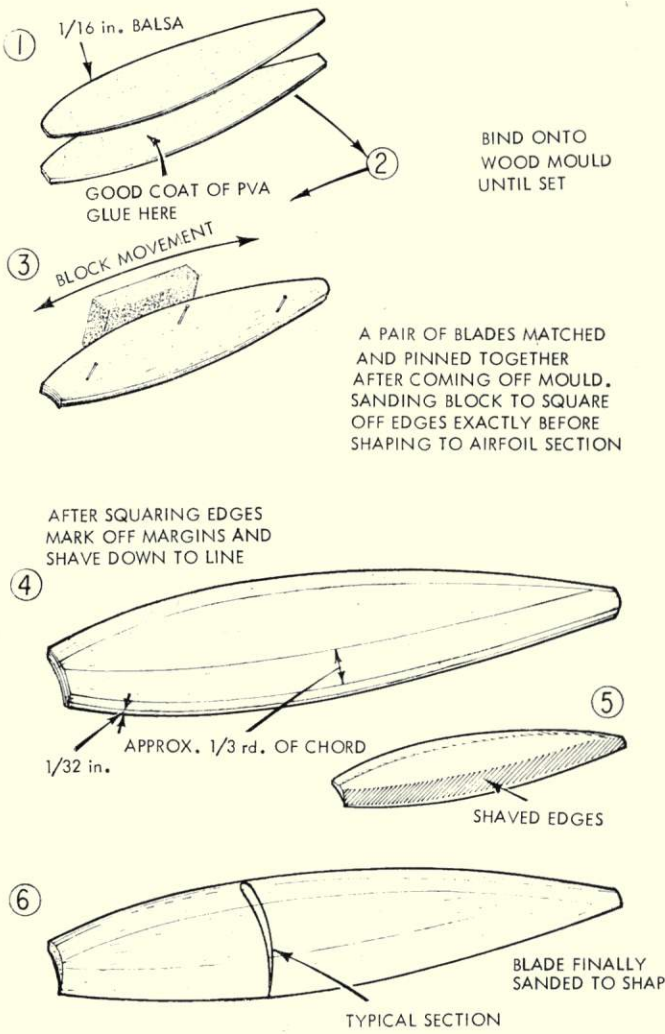
Mark a face side on each piece of balsa as it is very easy to reverse them when in the throes of glueing up so many blades! With three or four tin can moulds and a couple made from wood, you could have 24 or 36 pieces of balsa all coated with glue – the face side is the top – the glue side!

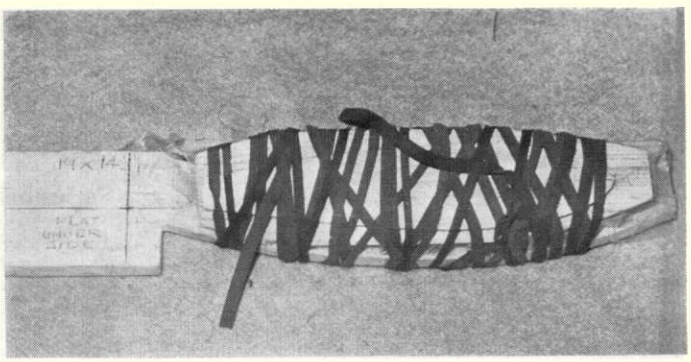
Place a glue coated lamination against a dry one and position on the mould, locating with the heavy marked outline showing through the polythene. Cover with a piece of polythene and lock in position with two pins. Now bind, not so tightly as to crush the balsa at the edges, with strip rubber (old motors are an ideal source) all along the blade, right round the mould, and leave to set for 12 hours. If you wish to hasten the setting, use cotton tape instead of rubber, cover with paper, not polythene, and put in the oven set at 100° F. for about an hour.

Identify each blade with its diameter and pitch as it comes off the mould, and put pair-matching marks on them otherwise you may have a lot of odd airscrews!

Match up a pair of blades and sand the edges square with a glasspaper block. Shave down the leading and trailing edges, using guide camber lines marked on with a ball point pen, and finally sand them down to the streamlined airfoil section they should be, using 2 or 3 grades of glasspaper.

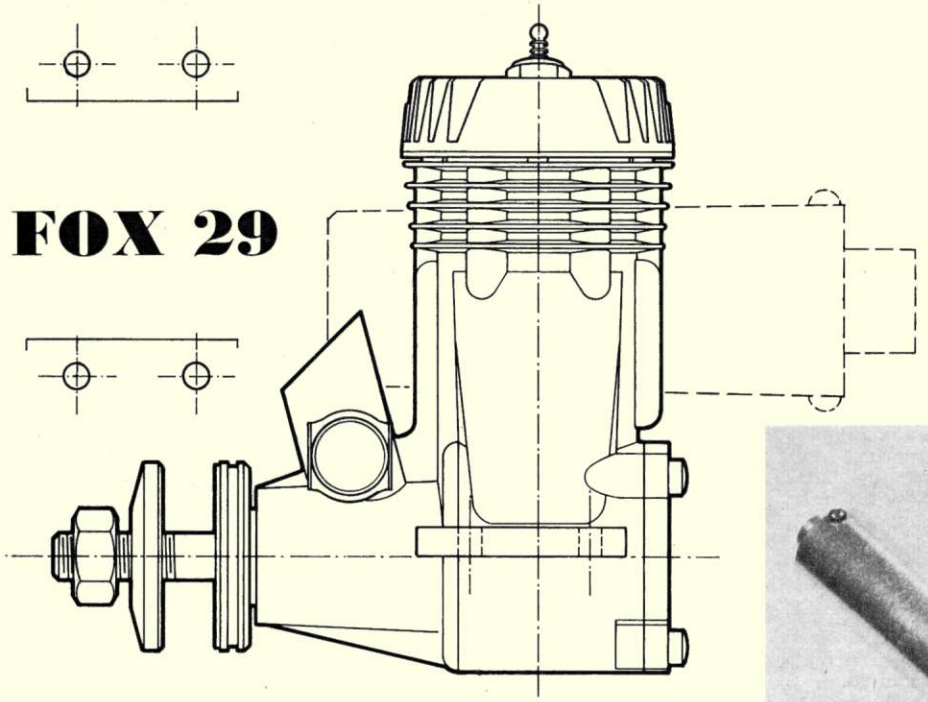
BLADE LAMINATING AND SHAPING SEQUENCE

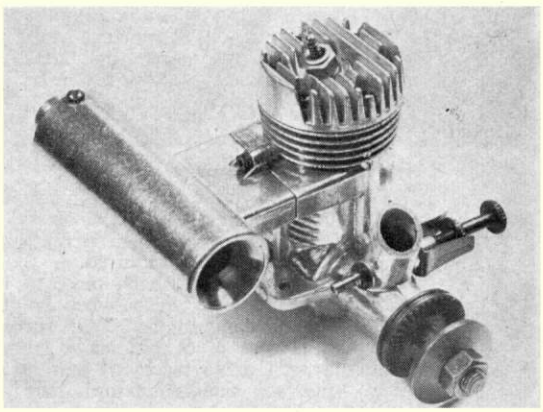




The wooden mould with the laminations secured in place with strip rubber. If in a hurry, then substitute paper for the polythene covering the mould, bind the whole with cotton tape instead of rubber, and pop into the oven set at around 100 deg.F for an hour. Careful what you eat for dinner though!

FOX 29





ENGINE TEST

by Peter Chinn

MORE THAN twenty years' experience in producing medium-size glowplug motors of simple construction that are easy to service yet of good performance, is at the back of this recently introduced American motor.

The current Fox 29 has the distinction of being by far the lowest priced 5 c.c. engine on the U.K. market at the present time. In fact, it costs less than some 1½-2½ c.c. motors. Intended, primarily, for control-line work – specifically stunt or general-purpose 'sport' use – it will undoubtedly appeal to those who have a limited budget but who nevertheless favour larger models that cannot be adequately powered by smaller engines of similar price.

The design and construction of the 29 are typically Fox. It is built around a one-piece body casting comprising crankcase and cylinder casing, has conventional open-loop or crossflow scavenging, a lapped piston and a plain (bushed) main bearing. The piston is of Meehanite cast-iron with straight baffle and runs in an unhardened steel cylinder-liner with a large centrally-divided exhaust port timed to remain open for some 142 degrees of crank angle. The transfer port period – as measured on our test sample – is also quite long at 134 degrees.

The hardened crankshaft is counterbalanced by means of cutaways each side of the crankpin and is coupled to the piston by an unbushed conrod of machined aluminium alloy. The shaft has a rectangular valve port and is fed from a circular port in the bearing to give a timing of 40 degrees ABDC to 45 deg. ATDC.

The cylinder head features the usual Fox wedge-shaped combustion chamber but is of a new external shape with very deep tapered fins and has an inclined glowplug. The plug fitted to the test motor was the standard U.S. fitting; namely a Fox long-reach type intended for use with not more than 1.5 volts. Purchasers are warned not to use a 2-volt lead-acid cell unless a suitable resistance or adequate dropping leads are employed, in which case, the owner should first remove the plug and check that the 'glow' is not excessive – i.e. bright red, *not* orange-yellow. The alternative would be to fit the engine with one of the new Fox 2-volt plugs. These can be identified, externally, by their black body finish.

Available for use with the 29 is the Fox 'B' size silencer. This, which also fits the *current* Fox 25 and 36 engines (i.e. those equipped with silencer attachment lugs) consists of an outer diecast aluminium shell and inlet duct, and an inner perforated tube through which the exhaust gases are discharged. Both the area of the perforations (which are in the form of a series of radial slits) and the area of the tailpipe outlet are very large indeed and, while offering somewhat limited 'silencing', cause virtually no power loss. There is a choice of two types of silencer: one with closed front (as used for our tests) and one with an open front to promote a scavenging flow of air through the inner tube of the silencer. On test we found no more than 100 r.p.m. difference under load between the two, although there might possibly be a very slightly greater difference in the air with forward movement giving a faster airflow through the open-front type.

While these silencers are not particularly cheap compared with the low price of the engine itself, they are quite compact and only add 1½ oz. to the weight of the engine.

Performance

Experience with the Fox 29 indicated that this motor is not suitable for operation on 'straight' fuel – i.e. one containing only methanol and lubricant. Our test motor needed a *minimum* of 5 per cent pure nitromethane (or 7-8 per cent commercial denatured nitromethane). One must remember that most American engines are operated on fuels containing nitro-

methane, and compression ratios are normally selected to suit such fuels.

The maker's recommended fuel for the Fox 29 is Fox 'Missile Mist' which is stated to contain 25 per cent nitromethane and it is obvious that the engine has been set up to run best on such a mixture.

On test, we found that, compared with the performance on Fox 'Missile Mist', the attempted use of straight methanol/castor-oil fuel caused the loss of 1,200 r.p.m. on a 9 x 6 prop. This was not due solely to the higher power output resulting from the use of nitromethane. It was also due to the fact that use of a 'cold' fuel in an engine set up for a 'hotter' mixture was causing ignition to be retarded. This was evident from the fact that some power could be regained by reconnecting the battery lead to the glowplug while the engine was running.

In due course, Missile Mist will, we understand, become available in the U.K. Meanwhile, one could use another U.S. imported fuel, such as K&B 'Supersonic-500' or 'Supersonic-1000' (both available through Irvine Engines) or a home-brew containing, say, 10-20 per cent nitromethane. As already stated, our test motor needed a minimum of 5 per cent nitro. On test, this, with a 9 x 6 prop, was about 700 up on straight fuel. Under lighter loads however (e.g. on props intended to allow the engine to get near to its b.h.p. peak in the air), 5 per cent nitro was not enough to avoid a falling off in power as the battery lead was disconnected. Our performance tests were therefore carried out on Missile Mist.

The general handling qualities of the Fox 29 were entirely satisfactory. Starting was good, using the orthodox procedure of priming the cylinder when the engine was cold and simply choking the intake when restarting it warm. The needle-valve, with its new larger control-knob, was much more convenient to adjust than the old type and held settings precisely.

Typical prop r.p.m. recorded on test included 9,900 on a 10 x 6 Top-Flite maple, 10,300 on a 10 x 5 Punctilio, 10,600 on a 10 x 5 Super glass-nylon, 11,200 on a 9 x 6 Top-Flite maple, 12,600 on a 9 x 5 Top-Flite standard wood and 13,000 on a 9 x 4 Tornado nylon. The 29 is not critical as regards prop size and, thanks to its useful low-speed torque, has good pulling power over a quite wide range of load speeds. Maximum torque was nearly 40 oz./in. at about 7,500 r.p.m., while the peak output, just short of 0.48 b.h.p., was reached at some 15,000 r.p.m.

SPECIFICATION
Type: Single-cylinder, air-cooled, glowplug-ignition two-stroke with crankshaft rotary-valve and bushed main bearing.
Bore: 0.738 in.
Stroke: 0.700 in.
Swept Volume: 0.2994 cu. in. or 4.907 c.c.
Stroke/Bore Ratio: 0.9485:1.
Checked Weights:
214 grammes — 7.55 oz. (less silencer)
255 grammes — 9.00 oz. (with Type B extractor silencer)
257 grammes — 9.07 oz. (with Type B closed silencer)

GENERAL STRUCTURAL DATA
Pressure diecast aluminium alloy *crankcase/cylinder-casing/front-housing* unit with bronze bushed main bearing and drop-in steel *cylinder-liner*. Pressure diecast aluminium alloy *crankcase backplate* secured with four screws. Hardened steel counterbalanced *crankshaft* with 0.500 in. dia. journal, 0.345 in. bore gas passage and integral 0.218 in. dia. solid crankpin. Lapped cast-iron *piston* with straight baffle, annular stiffening rib above bosses and 0.156 in. dia. solid *gudgeon-pin* retained by wire circlips. Machined aluminium alloy *connecting-rod* with plain eyes. Deeply finned pressure diecast aluminium alloy *cylinder-head* with .010 in. aluminium gasket and secured to cylinder casting with six screws. Blued steel *prop drive washer*, retaining washer and hexagon nut. Steel 7.26 mm. i.d. choke insert retained by brass spraybar. Beam mounting lugs.

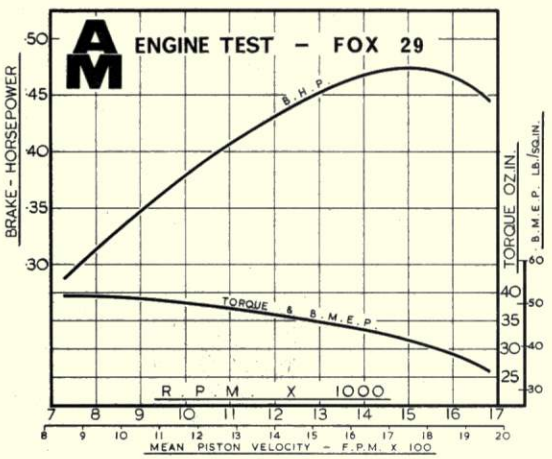
OPTIONAL EXTRAS
(i) Size B open-front silencer, P/N 90211
(ii) Size B closed front silencer, P/N 90212
(iii) Aluminium propshaft extension, ½ in. P/N 90401
(iv) Steel propshaft extension, ½ in. P/N 90402
(v) Aluminium propshaft extension, ¾ in. P/N 90403
(vi) Steel propshaft extension, ¾ in. P/N 90404

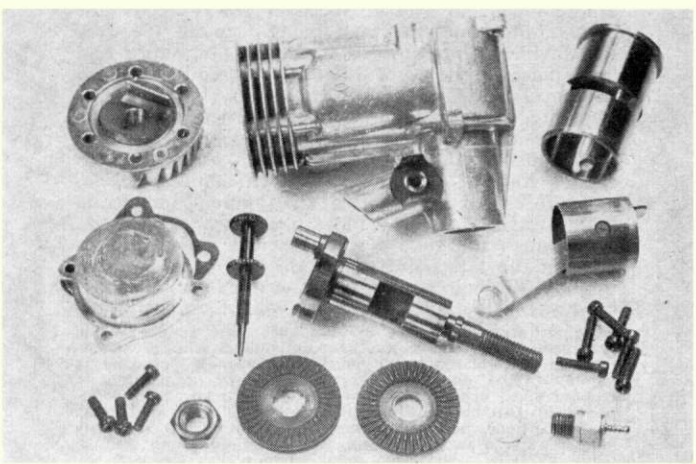
TEST CONDITIONS
Runnning time prior to test: Approx. 1 hour
Fuel used: (i) 75 per cent methanol, 25 per cent Duckhams Racing Castor-oil (Running-in). (ii) Fox 'Missile Mist' (Tests).
Glowplugs used: Fox standard 1.5 volt platinum-rhodium filament long-reach.
Air Temperature: 13 deg. C. (56 deg. F).
Barometric Pressure: 29.70 in. Hg.
Silencer: Fox 'B' closed front type.

Unquestionably, this new Fox 29 is very good value. Admittedly, the attraction of its remarkably low initial cost, is slightly reduced by its need for more expensive fuel. This could, one feels, be overcome if the manufacturer were to offer it on the U.K. market with a slightly higher compression ratio.

Power/Weight Ratio (as tested on Fox Missile Mist fuel with silencer): 0.84 b.h.p./lb.

Specific Output (as tested on Fox Missile Mist fuel with silencer): 96 b.h.p./litre.





AIRCRAFT DESCRIBED No. 222

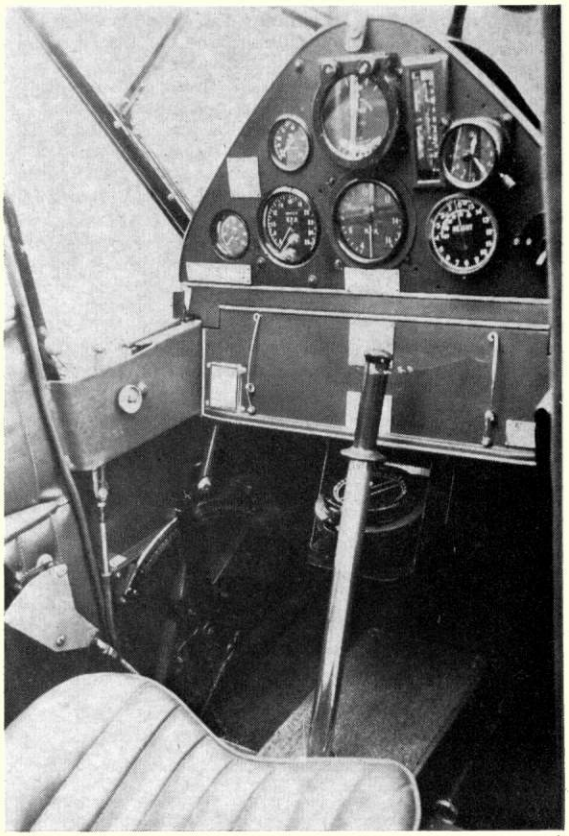
de HAVILLAND DH85 Leopard Moth

DESIGNED AS a replacement for the earlier *Puss Moth*, de Havilland's *Leopard* was a two-three seater intended for private owner operation. The *Leopard* can easily be distinguished from the *Puss Moth* due to the distinctive tapered wing, repositioned undercarriage and externally braced tailplane. As in its predecessor the pilot sat in the front for first class visibility while there was a tandem arrangement for two occupants behind him, with room for luggage.

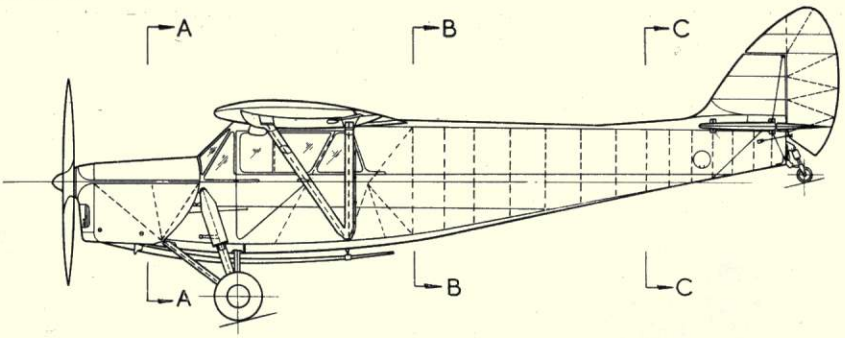
One of the more novel features, which was also fitted to the *Puss Moth*, were the undercarriage leg shock absorber fairings which, when rotated through 90 degrees, formed an effective air brake, steepening the glide angle from 1 in 12 to 1 in 9. The wheels were fitted with 'Bendix' wheel brakes.

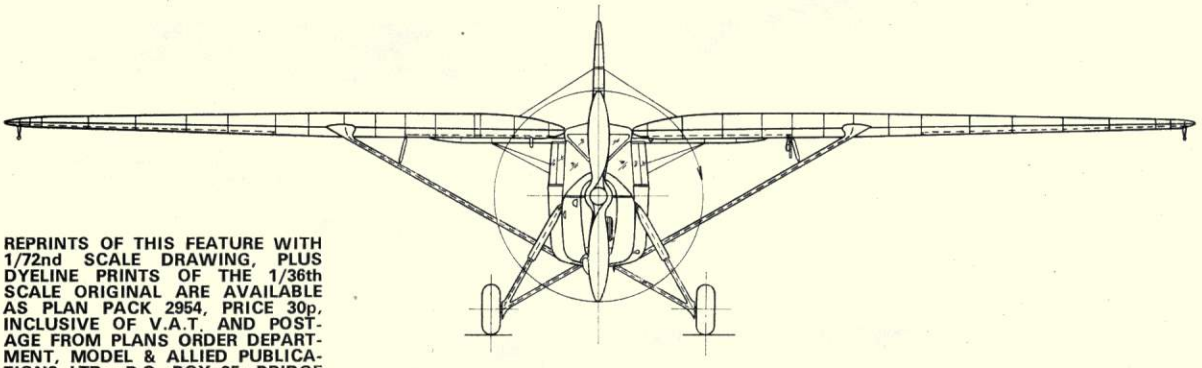
The DH85 was an immediate success, for the prototype G-ACHD won the 1933 King's Cup race at Hatfield with an average speed of 139.51 m.p.h., the pilot appropriately enough being Captain Geoffrey de Havilland himself. Not only this, but third and sixth places in the event were also secured by Leopard Moths G-ACHC and G-ACHB, surely very effective publicity, and not surprisingly the orders soon came flooding in. In three years, no less than 132 Moths were constructed, a good 70 of which were registered in this country. The first 30 aircraft featured a slab-sided fuselage, but later machines were 'padded out' with stringers to give a more pleasing appearance.

Although the welded steel fuselage was a proven concept, de Havillands again decided to go for the more traditional spruce and plywood box structure, saving considerable structural weight. Many long-



Heading: originally made in July 1940, this Leopard Moth was used by the R.A.F. for communications with 26 Squadron, and afterwards with the Hawker Aircraft Company to whom it was sold in 1946. Subsequently transferred to Graviners, to appear as above, it was sold abroad and became HB-UAB but was unhappily destroyed in a fatal crash in 1959. Right, actually a Puss Moth cockpit but relatively similar, this view gives one an immediate impression of the 'solo' pilot position.





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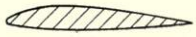

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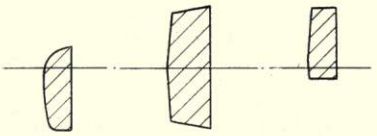

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DE HAVILLAND 85 LEOPARD MOTH

FT

Right, seen at Vintage Aircraft rallies, and always a popular spotter's subject, 'CMN' was first delivered to Personal Airways Limited of Croydon before the war and has been used as an execut ve transport by Alvis Ltd., at Baginton.

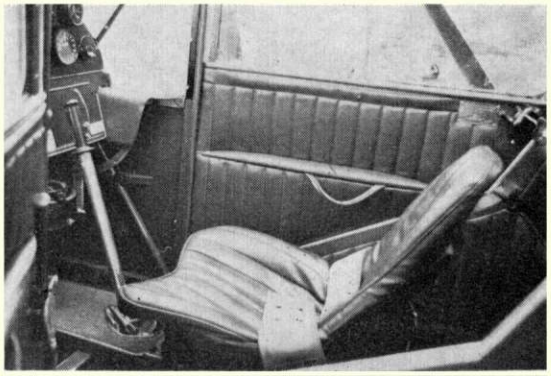
Left, reconstructed after years of tender loving care by P. Franklin, at White Waltham, 'PKH' is a superb restoration made largely from parts of 'CGS'. See also the two photographs at the foot of the page.

distance flights were undertaken with the *Leopard*, one of which, to Australia, was a record breaker – G-ACLX flown by Bernard Rubin and Ken Waller succeeded in smashing the previous record for the return dash to Lympne in 8 days and 12 hours.

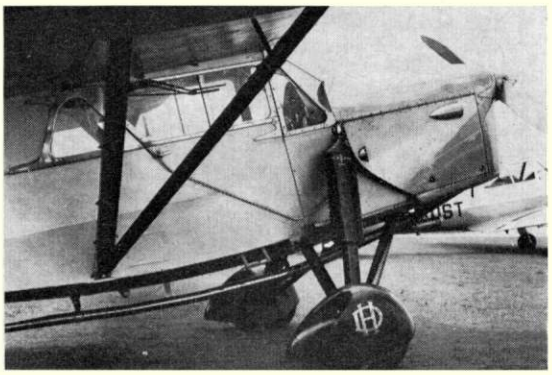
The prototype *Leopard Moth* proved to be an invaluable test bed for the de Havilland Gipsy Six R engine fitted with a variable pitch propeller. The type was redesignated DH85A and tests on this aircraft helped in no small way the success of the later *Comet Racers*. (See Aeromodeller Plan Pack No. 2149, price 60p). Both the Ratier and Hamilton airscrews were tested on this aeroplane. Tests were taken from May to August 1934 when the engine was finally granted approval.

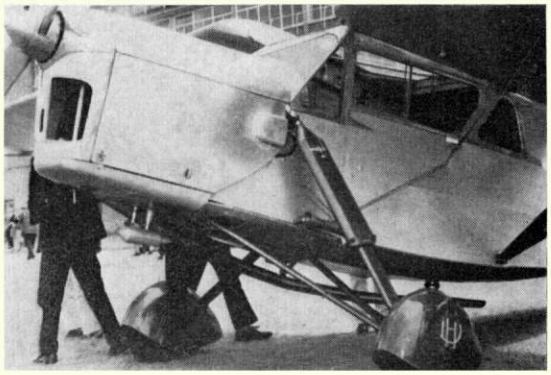
Fourty-four U.K.-registered *Leopards* were impressed into R.A.F. service at the beginning of hostilities and soon the drab wartime camouflage covered over the gay peacetime colour schemes. The majority of these service machines were used for communications.

There are at least seven *Leopard Moths* known to be in existence at the time of writing and may be seen at air displays during the summer months. For those who like making comparisons the price for the DH85 in the '30s was £1,125! Maximum speed was 140 m.p.h. and the Leopard Moth could cruise comfortably at 120 m.p.h. Power plant was the ever reliable DH 'Gipsy Major', a 130 h.p. air cooled, four cylinder in line, designed to run inverted. The *Leopard Moth* remains a most attractive economic proposition for the private flier, especially when one compares the fuel consumption figures for similar modern 3-seaters. Moreover, its folding wings permitted it to be towed away from the airfield or at least to occupy small hangar space – one of the most costly of all elements in light aircraft operation.



Right, a Puss Moth pilot's seat, similar in position and layout as the Leopard. Below, two views of the spatted undercarriage on P. Franklin's Leopard Moth which has the DH trademark on the spats, normally seen on the wheel hub discs.





topical twists

by 'Pylonius'

illustrated by 'Sherry'

Freedom Flighters

ACCORDING to a correspondent to this journal we model flyers are a pretty lily-livered lot when it comes to standing up for our rights. One grimace from any jumped up bureaucrat and off we go with our tailplanes between our undercarriage legs. Instead of holding fast to our hard won flying fields we meekly offer our C.G.'s to the size 12 boot, and where our colour code pennants should be bravely flying there is only the white flag of surrender.

The writer concerned, who does not seem to hide his particular light under a bushel, may well be right. Where other, more thrusting people are prepared to fight for their objectives, we meekly form a queue. In many another country the powers that be would not dare to try to evict people from their hallowed territories unless they could be sure the riot police could handle the situation; over here all that is needed is one superannuated park keeper waving a walking stick and we are off like a shot.

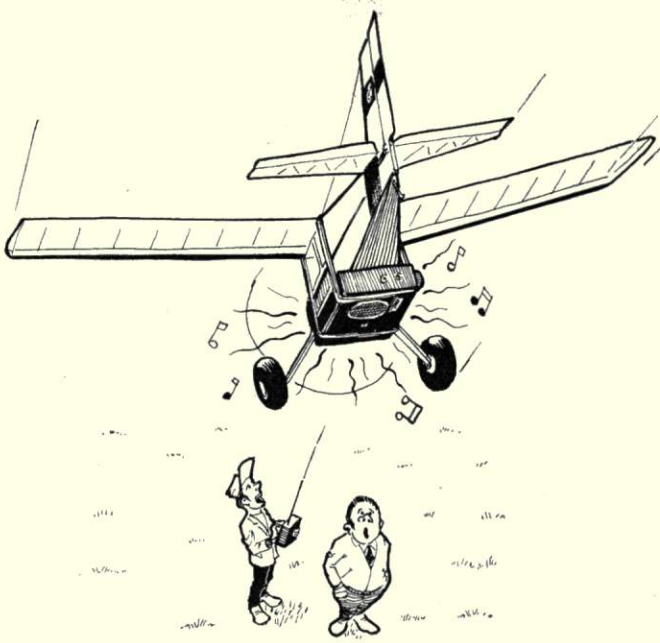
What nobody seems to know is what exactly would happen if you did decide to stay put on your local patch in defiance of the all-powerful byelaw? Our freedom fighting friend may be right in thinking we are supported by *Magna Carta*, the *Bill of Rights*, *Ancient Lights* and other historic warrant, but the general feeling is that this is the age of the bureaucrat who can get the law amended to just what he wants regardless of what they did in Good King Charles's golden days.

And on the subject of law, how many modellers, insured under one scheme or another, know what is in the small print? I am always afraid that if I do clobber somebody or something fragile the claim might well be invalidated because I wasn't flying in the Gobi desert or similar unobstructed site.

Up the Pole

The other day, on a remote Essex field, I saw enacted a curious ritual. Over the wet pasture walked three quaintly garbed characters; they were wearing dayglo jackets and plastic helmets, and each was wielding a coloured flag on a stick. At the far end of the field they stopped by a long red and white pole and arranged themselves before it. Need I go on? No. We all know what they were and the nature of their strange mission: they were of that intrepid breed of daredevil, the pylon race flagmen about to face that ordeal under which they might flag but never waver. But would the layman (a recommended posture in the circumstances) be misled into thinking it to be a traditional form of olde English dance, or some bucolic antic like upping the pole?

Possibly at some future time, when pylon racing has gone the way of bear baiting, cock fighting and other cruel sports, it could be that the ritual of the flagmen taking up their posts will still be commemorated. People will wonder what is happening on the plastic grass specially laid out in the shadow of the huge office block.



'I went over to electric power, but couldn't stand the silence.'

'What's it all about?'

'Don't know, really. I did hear it's some old tradition connected with the worship of flying objects when this used to be open fields'.

Tact-ical Flying

According to reports seeping back from across the Channel the French approach to tactical flying is not one of outright opposition or mumbling disapproval but rather of smothering it with family affection. The rules may allow only one entry per person, but a Nelsonian eye is turned on the disarming prospect of *grandpères* and *petit enfants* solemnly presenting themselves at the entrants' enclosure.

Thus the model flyers using what might be called 'relative tactics' are limited only by the output of models and the wealth of progeny, giving, in an international field, a more than tactical advantage over the one model per man visitors to whom such occasions, for obvious financial reasons, are always 'stag'.

Some bending of the be-whiskered rise-off-ground rule also seems to have been allowed; models rocketing up from the grass with a liveliness far in excess of that obtainable from six feeble strands of rubber, and all accomplished without loss of face, let alone precious seconds.

Perhaps it is all part of the spirit of *laisser faire* that we must expect now that we have become Europeans.

Big Come Down

It would seem that 'Thermal Soarers' are just a bit too grandiosely named, for thermal soarers is just what they ain't, according to a recent report. Put up an A/2 on a short line and away it climbs on a big fat thermal almost as of right, but pull up a thermal soarer to a height where you might think the thermals are getting really worked up and the model just does not rise to the occasion. Why this should be the pundits have not quite worked out, but it has got something to do with the fact that thermals tend to drift with the wind whereas the soarers do not.

Perhaps all this holding into wind could be summed up by saying, that which doth bore doth not soar.

GADGET REVIEW

a selection of readers' hints and tips

ACCURATELY MEASURING the dihedral of a wing is not always as simple as one may imagine. If one simply employs a ruler, then you must be sure that it is *exactly* vertical to the building board – and even then it is often necessary to 'estimate' the actual reading on the scale. Reader P. A. Scorey, who has submitted several useful ideas to these pages before, has a neat solution – he simply takes a large carpenter's square and attaches a 'Bulldog' clip to its blade. Operation is obvious – just move the clip up the blade until it touches the tip and then the dihedral may be measured; checking the opposite tip without altering the clip will show even minor variations very clearly, see *sketch 1*.

And now a neat twist to a fairly well-known but little employed tip. P. N. Bragg of Sutton found that when cutting out balsa formers, wing tips, etc., the sharp angles and corners that lie across the grain tended to split away, even when using a sharp blade. This he prevents now by doping on (one coat only is sufficient) lightweight Modelspan tissue, to both sides of the balsa sheet. He further suggests that if building from a plan, then the individual parts may be traced onto the tissue before it is doped onto the sheet (see *sketch 2*). Care should be used when doping tissue onto sheets of printed balsa parts, as supplied in some kits, as the ink may smudge making parts illegible. Also do not apply more than one coat of dope in order to keep shrinkage to a minimum.

Glow plug connectors seem to be like a magnet for would-be inventors. Latest device (illustrated in *figure 3*) was submitted by T. Clithero of Stamford, Lincs, who employs two 'Terry' clips (one cut off below the centre hole), a nylon bolt plus a few odds and ends. These Terry clips are available in a wide range of sizes from most ironmongers, Do-it-Yourself shops, etc., and thus it should be possible to fit most engines – and with a little adaption even engines with off-set plugs could be accommodated. The device illustrated has been employed for some time on the owner's D.C. Wasp, and has been entirely successful. Could also be installed on the engine with a suitable two-pin socket hidden on the model for scale enthusiasts or those who use fully cowled motors.

Ever burnt out a glow plug and been unable to find a spare? Or if you can find one, then what's the betting its been lying around the bottom of your field box for so long that it is full of dirt – which could damage the element, or worse still, score the liner of the engine if not discovered in time? H. Pickles of Burnley, Lancs, no longer suffers from these problems – at least not since he discovered the solution described in *figure 4*. He found that the tops from *Britfix* cement tubes are just the right size for holding the threaded portion of a plug – and now has half a dozen of these caps epoxied to the lid of his model box. Spare plugs are now always to hand, protected from dirt.

In *figure 5* is drawn a very neat, practical, system for adjusting elevator neutral on fixed-wing control line stunters – an idea submitted by well-known aerobatic enthusiast Glen Alison, now living at Rickmansworth, Hertfordshire. The drawing is self explanatory, and shows how easy it is to trim a model for equal response to up and down elevator, so essential for precise flying. This is a much more accurate method than trying to bend the elevators or flaps, while the only access hole necessary is one just large enough to take a small screwdriver.

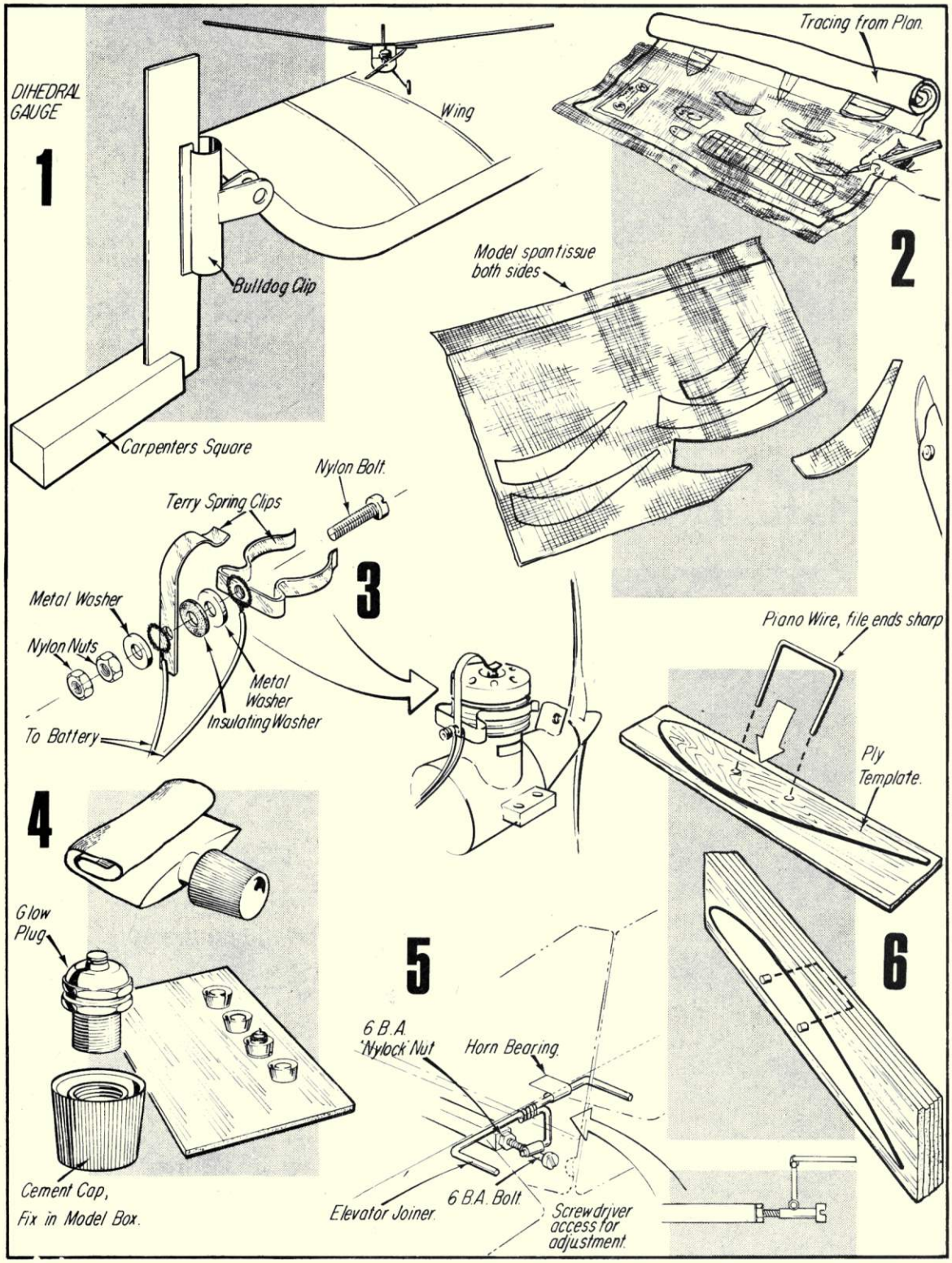
Scottish reader, Sebastian Robinson, frequently uses the 'sandwich' method of making wing ribs but has often found trouble in holding the stack of balsa blanks together for carving and sanding – pins are too 'wobbly', nuts and bolts too time consuming. His idea (sketched in *figure 6*) is quick, simple and positive. Firstly, he bends a length of 14 or 16 swg wire into a 'U' shape and files the ends sharp. Next the two plywood rib templates are cut out and are marked with the points of the 'U' holes, being drilled at the points. The required number of rib blanks are then cut out – as each one is cut, it is laid under one of the templates and the sharpened wire used to punch a pair of holes in it. Finally, the ply/balsa/ply sandwich is threaded onto the wire so that final shaping and sanding may be completed. To ensure a really tight fit, the ends of the 'U' may be pulled out slightly before threading the ribs on.

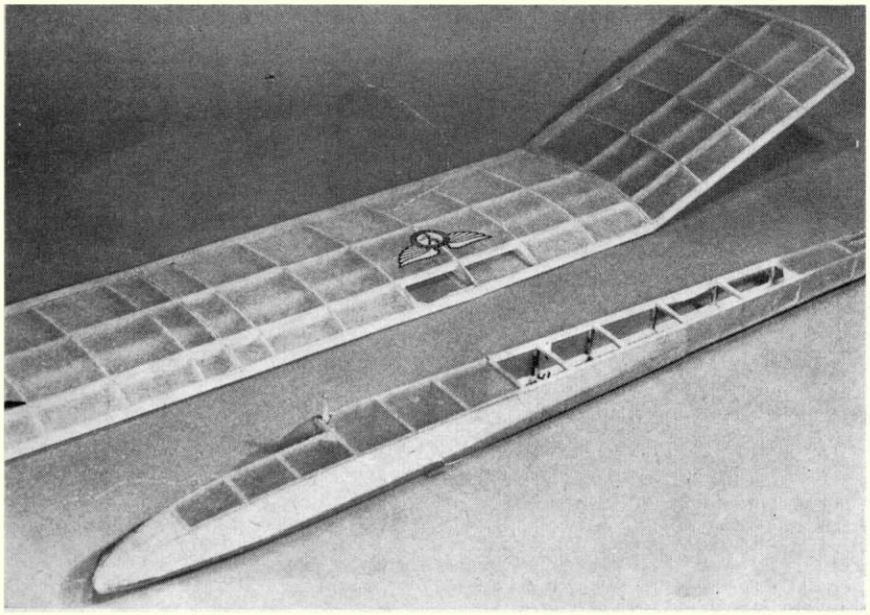
Not Illustrated

A further idea from Mr. Storey, and particularly useful as one 'on the field' emergency solution, is to use small slices of fuel-tubing as a substitute for spring washers for 8 or 6BA bolts on smaller models. Probably not as effective as the proper item, but nevertheless, better that nothing at all!

Instrument panels are another favourite topic for contributors to this page, many using scraper-board as the dial faces. Mr. S. Pearson of Market Harborough, Leicestershire, is another to utilise scraper board (obtainable from most art stores) but as a novel twist, glues a suitable piece of this material into the centre of an ordinary button, of approximately 1 cm. diameter. The raised lip on the button simulates the bezel of an instrument well, giving a more authentic appearance to the finished product.

Tired of having a box full of oily rubber bands after a flying session? Harry Timms of Chesham, Bucks, found a good way of cleaning the gooey castor oil mess from his wing retaining rubber bands. He just keeps a jar containing 'Cat Litter' (available from any pet shop) in his model box. At the end of a flying session he just drops the offending pieces of rubber into the jar and shakes them around. Come next flying day, open the jar and take out those nice, clean bands.

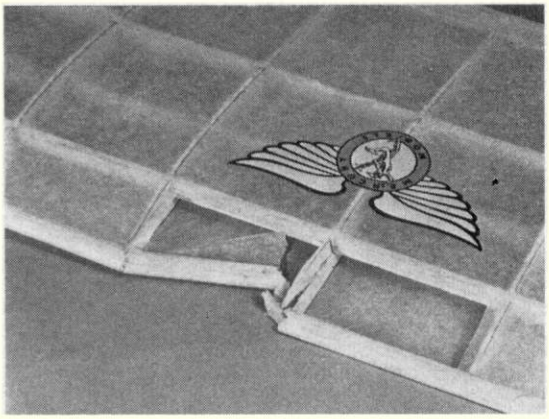




The repair work completed, all that remains now is to cover over the 'gaps' with tissue in the normal manner, and then back to the flying field!

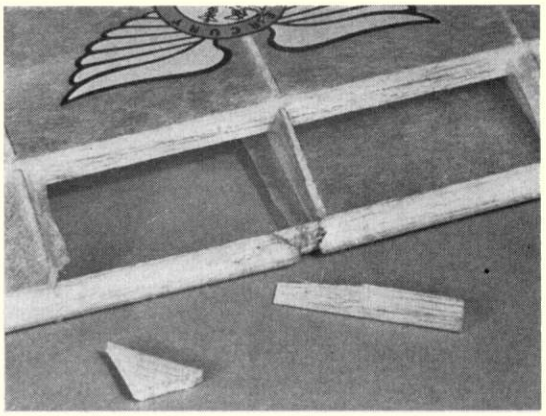
Our beginners' series continues with advice on carrying out basic repairs which may become necessary.

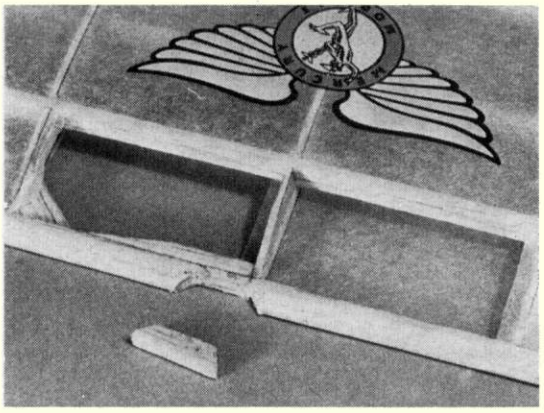
BACK TO ..... SQUARE ONE!



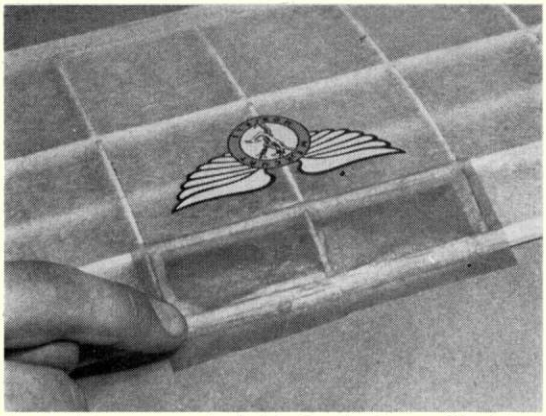
IT IS INEVITABLE, but sooner or later you are bound to damage your pride and joy to some degree. If the *Swan* survives your initial attempts at trimming and landing under the influence of a D/T, then it is unlikely to suffer any major damage as it is reasonably light yet features robust construction. However, any tissue covered model is likely to suffer from tears caused either by fingers slipping, hitting obstructions, or perhaps most likely of all, due to transport to the flying field.

Left: Well, that was the damage caused by hitting a tree! Note how the leading edge was broken in two places and the front part of the rib split. Trim away the tissue with a razor blade to expose damage. Below left shows the first stage completed – the leading edge has been glued back together, although a small piece is missing. A right angled gusset of $\frac{1}{8}$ in. balsa and a piece of 3/16 in. square balsa tapered along one edge have been cut out. Below right shows these pieces glued in position (note taper direction) to reinforce the breaks, and a piece of scrap balsa ready to be spliced into the leading edge to fill the gap. Note how the ends are angled.





The repair is completed by sanding down the scrap balsa insert so that it matches the contour of the leading edge. Use a sanding block when doing this and be careful not to overdo it, as you may weaken the existing wood.



Last task is to cover the 'hole'. Cut the tissue with at least $\frac{1}{8}$ in. overlap, apply tissue paste, dampen tissue and apply. When dry, trim off and apply three coats of dope, thinned approximately 50 per cent.

Many of these minor injuries may be repaired on the flying field in a temporary fashion, allowing you to make a more permanent, or just neater, repair when you get home – but this does mean, of course, that you should carry a few vital pieces of equipment in your 'field kit'.

Most common form of damage without question is the small tear in the covering such as may be caused by a twig if the model lands in a tree. If the edges of the damaged tissue still practically touch, then the simplest solution is to run a bead of balsa cement along the torn edges – the glue will quickly shrink pulling the edges together and 'filling' the gap.

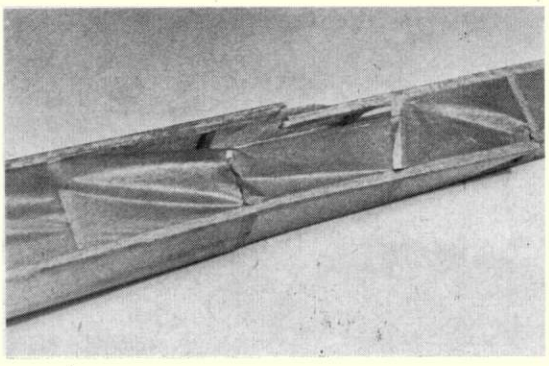
A neater method is to patch the tear, but to do this you need to carry a tin of thinned dope and a brush with you, as well as scissors and spare tissue. Now if a rip occurs you simply cut a patch of tissue sufficiently large to amply cover the damaged area, and dope the patch in place. In a few minutes (assuming it's a sunny day!) the dope will be dry and your patch will be securely stuck in position.

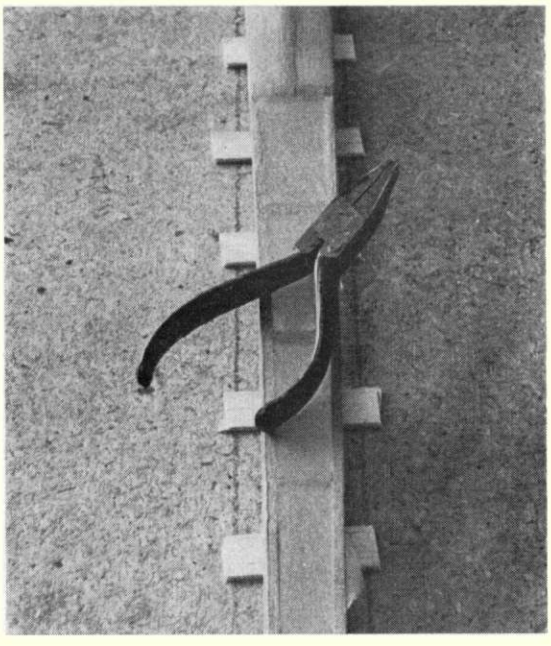
If you have used coloured tissue, you will notice how the colour deepens when two layers are doped together – remember this will make the patches rather obvious on your model. This does not, of course, really matter unless you are rather fussy, or proud of the appearance of your model. The only solution in this case would be to cut away an entire panel of tissue and then to re-cover this section, but even then an overlap is necessary and the edges will show up clearly. Sorry, but there you are – and it certainly is not worth re-covering the whole wing as more damage is bound to occur sooner or later.

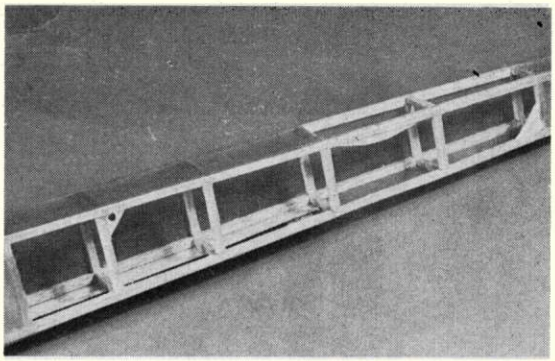
These then are the 'superficial' repairs you can make on the field – but what else is likely to break? Well, on many models the wing tips can be broken off should the model cartwheel, but this is not so likely on the *Swan* as the tips are quite short. Again, some gliders break across the centre section if towed up in a strong wind – but the *Swan* is very tough here. In fact, the most likely cause of damage is hitting an obstacle – in our case a tree! Our actual repair sequence can be seen in the photographs, but remember one or two basic principles when making a more serious repair:

1. Study the problem carefully once the tissue has

The damage to the fuselage is seen in the picture below. Two longerons were snapped and several of the vertical braces had come loose. When repairing the fuselage, it is essential that it remains straight and true. To check this, draw two parallel lines approximately $1\frac{1}{2}$ in. apart on your building board. Now, when you place the fuselage between these lines it is soon clear when it is straight (see picture at right). Note how we had to place $\frac{1}{8}$ in. packing pieces under the fuselage as the cockpit was preventing it from lying flat on the bench. Glue the longerons together, then place between the lines and add a little weight to keep the hole flat and in contact with the board.







After longerons have been re-joined, add the vertical braces. Next reinforce the joints as shown. We used a $\frac{1}{8}$ x $\frac{1}{8}$ in. strip, tapered as shown for one break and a $\frac{1}{8}$ in. sheet triangular gusset for the other as it occurred next to an upright.

been cut away, and make sure that you have spotted all the damage caused.

2. Glue as many pieces as possible back together – even if one or two 'gaps' remain.

3. Make sure that the repair does not cause a warp to appear – always check fuselages for straightness and wings for flatness. Repair on a flat surface whenever possible.

4. Fill any 'holes' or gaps caused by missing pieces, with wood of a greater section carefully spliced in place, so that they may be sanded to section.

5. Add gussets or 'splints' to strengthen the broken joint. When adding 'splints' taper towards the ends to prevent a 'sudden change' in section from the repaired area to the 'normal' one. A sudden change causes a 'weak spot' to occur.

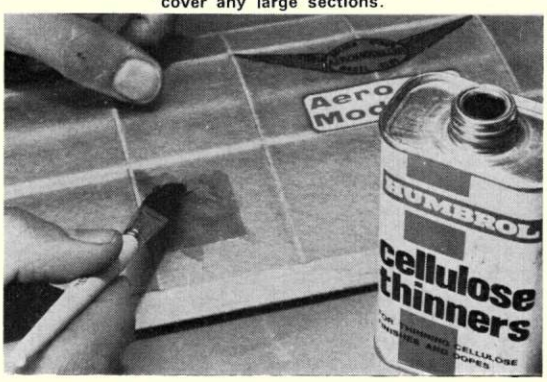
6. Do not make your repair unnecessarily strong (or else the wood surrounding it becomes very vulnerable to damage) and do not make the repair too heavy, especially if at the rear of the fuselage or on the tailplane, as this could cause the centre of gravity to be moved a long way back.

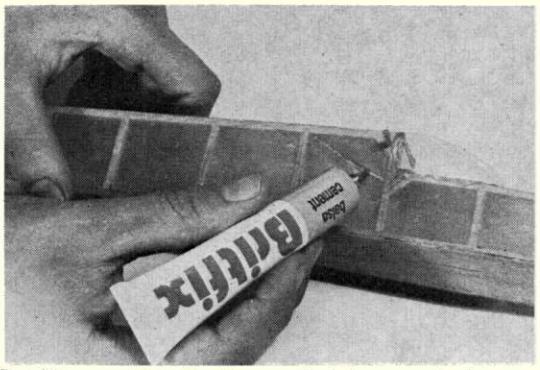
7. Take your time and recheck for accuracy frequently.

8. Re-cover the area and dope in the normal way.

9. Before flying again, check the C.G. position and make sure that all the surfaces are true to one another once more. It would be a wise precaution to re-trim the model, just in case.

Applying a patch over a tissue rip. Just cut a square of tissue big enough to cover the damaged area, place the patch in position and apply dope through the patch on to the original surface. This will make the patch stick securely in place. See picture below. At right, a good way of strengthening the covering at vulnerable points such as the centre section, is to simply dope a second layer of tissue in place as shown. This gives quite a tough surface but, of course, the weight is increased, so do not be tempted to cover any large sections.





Repairing a split in the tissue with balsa cement. Just run a bead of glue between the two torn surfaces. The glue will shrink up and seal the joint completely.

Incidentally, we mentioned that models are often damaged on their way to and from the flying field – and (unfortunately!) how true that is. Prevention is better than cure, however, so what can you do about it? Undoubtedly the best solution is a model box (Ron Coleman's article in the November 1972 issue of *Aero Modeller* gave many useful ideas), but if you do not wish to go to these lengths, there is a very simple solution. Newspapers! A thick newspaper can be folded to fit around a wing panel or tailplane, and will certainly help prevent tissue rips.

Using tape to seal the edges, they can be made to slip over the tailplane or wings – use elastic bands to hold in position. With a little bit of thought they can be made into tubes to protect the fuselage too – nice and cheap anyway!

Also, do you find that your fingers tend to poke holes in the centre section when stretching the rubber bands to attach the wings to the fuselage? One way of preventing this is to double-cover this area. Just cut a strip of tissue wide enough to cover the three centre ribs (2 in. wide) and stick to the top surface with dope. When dry, give a second coat, and you will find the 'tear resistance' greatly improved at this point – in fact you should not need to repair this section again. However, do not be tempted to cover the entire model in this way – it will be *far* too heavy!

CONTROL LINE NEWS

Combat News

Combat seems to be the fastest growing sport on the Continent, and as a consequence, their standards are rapidly growing. Claus Maikis now sends us news of the first 'all combat' contest to be held in Germany, organised by arch enthusiast Johnny Dubell of Munich.

Although there are not too many competitors in Germany, the organisers had a busy day with some 20 entrants – which may seem poor compared with British standards, but in Germany control line sport (sport in general!) is not popular. As well as competitors from the Stuttgart and Munich areas, they were pleased to have visitors from Italy and France. Many of them flew just for fun and for a relaxing change, as the names are normally better known in team race circles. One could see Schwarz and Ilg, Kaul, the current champion Reichle, even Paul Bugl risked a model.

There were some surprises by the early elimination of flyers like Ilg, Reichle, Nagy (Munich) and Morelle (France) in the second round. Models were in general the *Ironmonger* or *Orcrist* type. Engines were mostly MVVS, Super Tigre and Webra diesels, with very few glows to be seen. At last, three flyers were left, so each had to fly against each other. Since they each scored a single victory, the final had to be repeated, leaving Tomelleri (Italy) in first place, Kaul and 'Johnny' Dubell second and third. Since Kaul is now living in Munich, he must have been influenced by Johnny, as he performed better than ever. The last three all used MVVS engines while Tomelleri had the biggest intake Claus had ever seen, the engine running on pressure.

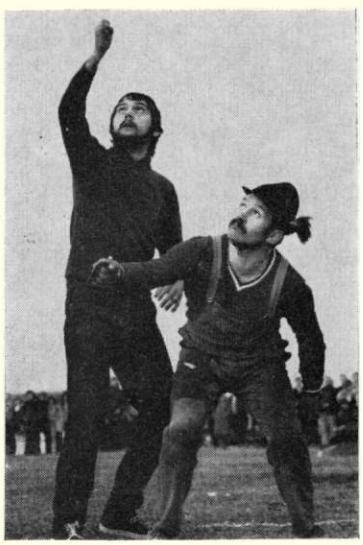
Spanish Champs

Montjuich Park, Barcelona, was once more the venue for the annual *'Championship of Catalonia'* meeting, where the excellent facilities, including two purpose-built circles laid down by the City Council on behalf of the *Barcelona–Sabadell Aero Club,* were much appreciated by the competitors.

The contest was particularly successful this year due largely to the co-operation of the Banca Catalana and to the effort and determination put into the work by the Aero-Modelling division of the Aero Club. Indeed the organisation was perfect in all respects and could be compared most favourably with any other meeting in Europe – except that there were no entry fees!

For the first time, the new FAI rules for speed were employed, which meant that 0.4 mm. lines had to be

Heading picture illustrates the superb facilities for the championship of Catalonia. Could this be the venue for a future European or International event? They certainly have the necessary organisation – and weather!



At left, best of the new generation of combat flyers, Thomas Ilg (left) gave Johann Dubell a great deal of worry at the Munich meeting. At right, Sergio Tomelleri eventually managed to defeat the German champion in a close-fought final.

Team race finalists at Barcelona were (left to right) Bonnin-Gil who were placed third, Pacheco-Parramon the eventual winners, and the Gaya brothers who finished in second spot.

used—which had the effect of lowering speeds by around 15 Km/hr., although the competitors found that with these increased safety standards, good flying could still be obtained. One practical result of these thicker lines was that propellers had to be somewhat cropped in order to allow the Rossi's to achieve their customary 'in air' 27,000 rpm. Only three of the nine competitors recorded 'official' flights, they being Parramon, Pacheco, and Gaya who finished in that order, recording 218, 214, and 189 km/hr. respectively. Surprisingly, they were the only ones using Rossi's—the remainder using Super Tigres, with the exception of A. Serrano, who made his own unit.

F.A.I. team race was very strictly administered, as several teams found to their cost when they were disqualified! The majority of these disqualifications were not for whipping or flying high, but for raising the inboard wingtip during pit-stops wich tends to illustrate lack of experience rather than 'deliberate' transgressions.

The Gaya brothers produced a new and very light (430 gm.) model powered by a Super Tigre, and this should be quite a potent machine when fully sorted. Their best heat time however was 5:47—sufficient to qualify for the final which they completed in a time of 11.03 to place second behind those well-known international flyers Pacheco/Parramon. They too had a new model—in this case weighing 560 grammes powered by a home-built engine which features rotary drum valve induction, being fed from a Bugl-type regu-flow tank. A pressurised re-fuelling system is used, and the machine normally averages 150 km/hr. for 28 laps, although 35 laps are possible. They performed particularly well, achieving times of 4:53 in each of the preliminary heats, and 10:13 for the final. Filling third spot in the final (11:47) were Bonnin/Gil who used both a home-built engine and a Super Tigre in the preliminary heats.

Although aerobatics attracted eight entries, the standard varied enormously between the top two contestants and the remainder—the scores reveal that many of the pilots were lacking in experience and/or preparation of their equipment. Mira of Muruia looked the likely winner after the first round when he led by some 215 points, but a fuel blockage in his second flight dropped him behind Segrelles of Valencia, who also happens to be the current Spanish Combat champ.

This event was held over the tarmac areas, so it is not surprising that they are known as the 'model and motor busters!'. Competition was close amongst the 15 entries, but it was Segrelles and Roura who met in a very hard fought final which ended in victory for the latter. Spanish combateers are keenly following the latest European trends and their models are thus very similar to our own—as are the power plants in several instances!

Together with these contests there was a 'rat-race' event run to a local formulae with 12 teams competing, a scale event and a demonstration by the Gaya Brothers' Rossi Vulcan jet which recorded 250 km/hr. Also, the ladies entered into the spirit of things too, with two pairs of sisters and one 'mixed' team competing in rat-race!

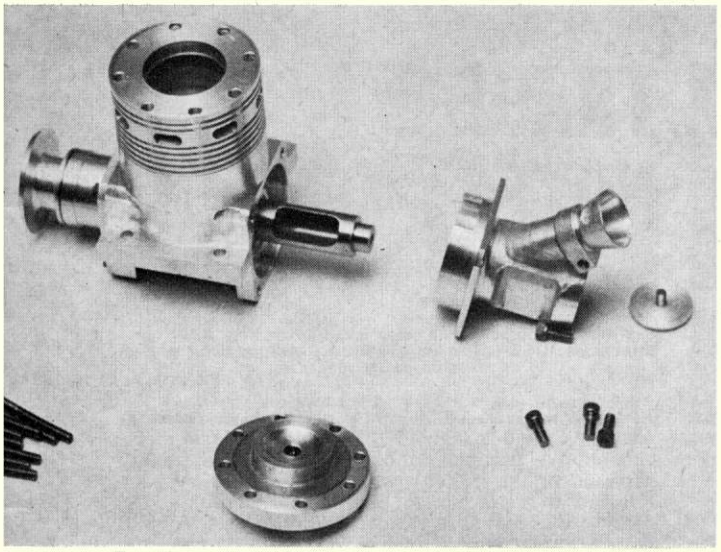
Most encouraging of all, it is hoped that in the near future a European or even International meeting will be held in Barcelona—there are certainly the facilities, organisation and goodwill to make such an event an enormous success. Nice climate too!

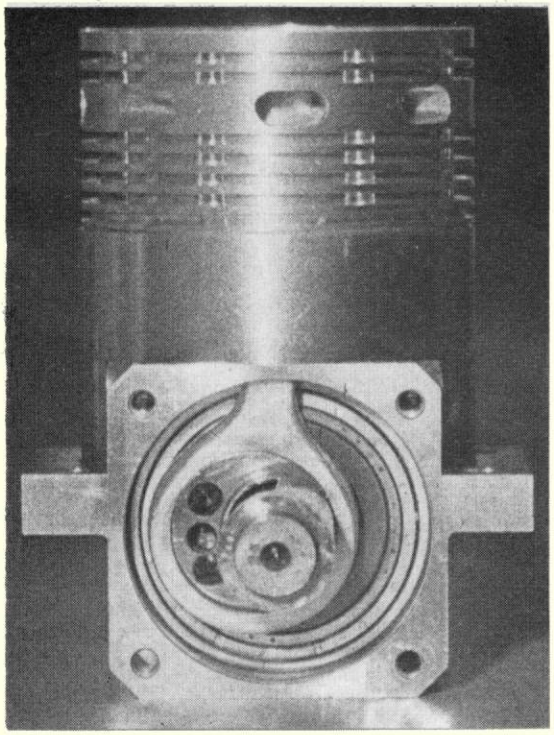
Elliot Speed Meet

News now via Trevor Grey from our somewhat less sunny shores, in fact the rain and wind-swept day of Easter Monday when the Elliot club held their annual speed meeting at their Rochester Airport car park site. The conditions were indeed most unfriendly for speed fliers, but despite this visitors came from as far away as Sheffield and Yeovil! Classes catered for were 2.5 c.c. Open, F.A.I., .29, .40 and .60, the 2.5 Open class being the most popular. Brian Jackson provided the highlight of the day by getting within 1 mph. of his national '29' record. He then used the same model but fitted with a K&B 40 motor in the new '40' class, which he again won but at a considerably lower speed!

Most technically interesting was Mike Billington's *very* original 'sleeve'-valved .60 cu. in. motor. In this superbly-made unit, the liner itself also reciprocates, having a stroke of approximately 3/16 in., being driven by another con-rod from an eccentric cam on the drum valve, the whole being supported by ball races. Induction is via a rather large drum valve. The

Paul Bugl (left) and Albrecht Reichle with the latter's model. Engine is a front rotary Bugl (surprise, surprise!) which develops as much power as the team-race motor, but with a higher fuel consumption.





Two views of Mike Billington's ingenious sleeve-valved motor. This unit incorporates a reciprocating liner – the photo above shows it lying approximately ¼ in. below the top of the crankcase. At right can be seen the eccentric cam which drives the conrod moving the liner.

idea behind the reciprocating liner is to eliminate the excessive transfer/exhaust overlap normally accepted with high performance two stroke engines. The system still enables 360 deg. porting to be retained. Certainly deserves success, although Mike is using it purely as a 'test-bed' and has had it 4-stroking up to 14,000 rpm. so far.

Another notable visitor, Ray 'Gadget' Gibbs, who though denying a return to the sport was heard to say that he was building a '29' model for the Nats. . . .

Andrew Keiller, now resident in Australia, with his Super Tigre 60 ABC powered speed model. Has recorded 176.4 mph on monoline.

Results

2.5 c.c. Open: Alan Woodrow (Yeovil) 143.4 mph.
F.A.I. : Alan Woodrow (Yeovil) 126.3 mph.
'29' : Brian Jackson (N. Sheffield) 163.2 mph.
'40' : Brian Jackson (N. Sheffield) 145.2 mph.
'60' : Martin Radcliffe (Feltham) 159.7 mph.

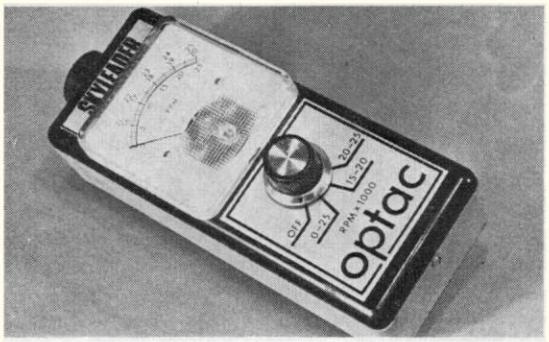
Down Under

Ex-*South Bristol* and *Bristol Bulldogs* club member Andrew Keiller (placed second in the Carrier event at our 1971 Nationals with a *Douglas Skyraider*) now a resident of Melbourne, sends details of aeromodelling in his part of the world.

At the Victorian State Championships held over Easter, he won the handicap speed event by recording 176.4 mph in the .60 cu.in. class – a category in which he now concentrates. Australians fly to the U.S.A. rules, i.e. six laps on 70 ft. lines, giving a ½-mile course. His model features generous wing/tail areas, flies very smoothly landing at a reasonable speed, and is constructed from a mixture of basswood and ply. Control is via an H & R torque unit and a Rolf Miebach geared mono-line handle which Andrew finds much easier to get on the pylon quickly than the more conventional push-pull type handle. Power is supplied by a Super Tigre 60ABC with a new head and mini-pipe, turning a cut-down Topflite 9 x 13. Fuel used is 70 per cent nitro, 12 per cent propylene oxide, 18 per cent oil.

Rat race is a popular event in Australia, but tends to get rather hairy – Andrew's last contest involved a 5-up flight which not surprisingly ended in a line tangle and heated arguments – and like all C/L events over there, is flown over very short grass. This is easier on props when landing, but falls a long way short of tarmac for trouble-free take-offs with racing and speed jobs!

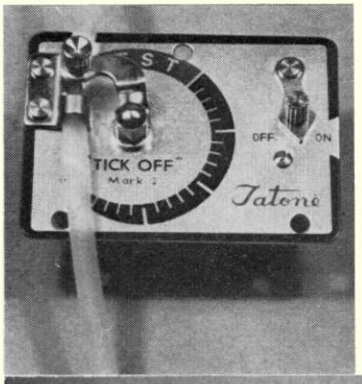
TRADE NOTES

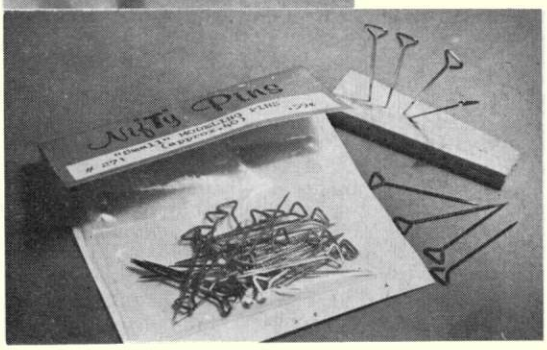


Skyleader's 'Optac' tachometer is approximately 5 in. long, 2 in. wide, thus easily fits the hand. Scale is large enough to be easily read.

IT IS QUITE some considerable time since our last review of the latest products to reach the open market, but at least this does perhaps have the advantage of allowing us to select some of the more 'interesting' articles!

One item in particular which we have found to be most interesting and useful, if not slightly depressing, is the **Skyleader Optac** light impulse tachometer. Depressing? Well, yes it does rather hurt to find out that some of your own motors are well down on power, especially when 'well down' refers to a couple of thousand r.p.m. . . . The unit is conveniently small and easy to use (just turn the switch to the appropriate r.p.m. range, hold in front of the prop and read the dial) and neatly made – not surprisingly as it is made by one of the best known manufacturers of R/C equipment in this country. We have used this tacho for several weeks now and find it almost indispensable for checking effects of various fuels, props, glow plugs, etc. Two versions are available, each with three scales. You may choose between the model reading 0-25,000; 10-15,000 and 15-20,000 r.p.m. or for high performance men the 0-25,000; 15-20,000 and 20-25,000 r.p.m. version. We particularly like the large-scale reading for each of the '5,000 r.p.m.' wide ranges as it may be read to an accuracy of 100 r.p.m. very easily. £16.95 well spent at Skyleader Radio Control (Airport House, Purley Way, Croydon, Surrey CR0 4RS).

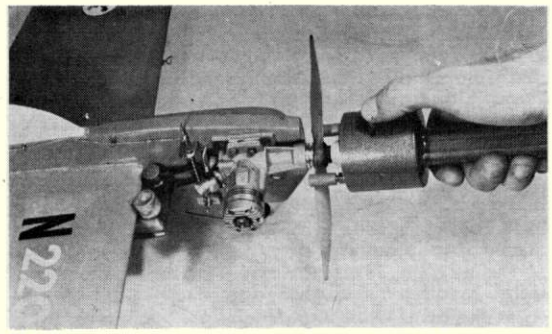




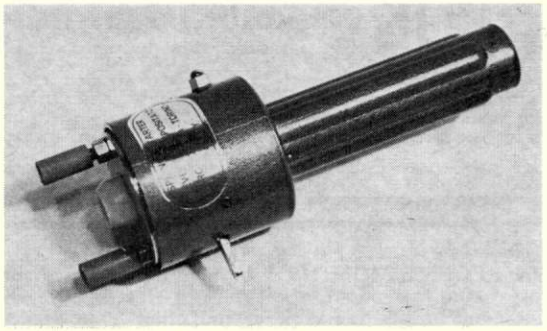
Items from 'Henry J'. At left the 'Flite Lite' silicon fuel tubing designed to be used with timers such as the Tatone 'Tick - Off' illustrated (also from H.J.N.) and below the 'Nifty T-Pins'. Large size versions are also available at the same price.

Before you can use a tachometer you do, of course, have to be able to start the engine – a task which many people seem to find difficult judging by the number of frustrated modellers we see at the flying field and the number of proprietary electric starters in the model shops. Snag with these aids to modern living, though, is that having spent many pounds on such an item, you then have to purchase a 6- or 12-volt battery (not cheap either) and *then* you have two more heavy items to carry around. **Euro Sales** (of P.O. Box No. 6, Twickenham TV1 2JD) appear to have the answer in the form of a clockwork starter, of Italian origin manufactured by *Aeropicola*. Sceptical? So were we, but the unit certainly possesses a deceptive amount of torque and turned a .19 cu.in. glow engine over *very* smartly for several revolutions producing instant starting. We also tried it on a 2.5cc diesel and a .09 cu. in. glow and good results were obtained in all cases – particularly the small glow with its lower compression when the prop was turned over very quickly. To use it is simplicity iself – just hold the 'prongs', rotate the handle against a ratchet for approximately four complete turns to wind up the coiled leaf spring, then place on motor – the end of the shaft being placed in a hard rubber cone, the two operating prongs either side of the prop. Push the lever to the left and away she goes. As soon as the motor fires the prop hits the prongs which rotate freely thanks to the ratchet clutch – and as these are rubber faced the prop is undamaged. The manufacturers claim that the device can start up to 10cc engines (though we have not had time to check this yet) and alternative wide 'prongs' are available to enable a motor fitted with a spinner to be started. Priced at £6.30 (plus VAT), the starter is available only from the distributors.

And that conveniently leads us on to the subject of propellers. **Maple Models** (108 Ash Road, Luton, Beds.) are now importing a few MVVS wooden propellers. At present, only a few sizes are available, but they include some useful looking team race and speed props as well as ones for more mundane use, and as the supply is likely to vary, it is well worth dropping a line to this address. The props are nicely produced, heavily lacquered, and are machined from a very light (in colour and weight) wood, which



The Aeropicola clockwork engine starter seen in operation – not that we intend using this in Goodyear racing, where such items are not legal! Also, the K & B 15 normally responds very well to the traditional engine starter – first finger on the right hand!



Another view of the Aeropicola starter, imported by Euro Sales, and available by mail order only. The two 'prongs' are rubber faced to prevent causing damage, and are mounted on a clutch so that they freewheel readily when engine fires.

escapes identification at present! For those who like modifying any item that they buy, we can confirm that this wood is easily 'worked'. Prices are from 41p.

Bartels glass fibre propellers are, of course, far from 'new'; in fact, they have been around for some ten years now, but **Henry J. Nicholls and Son** (308 Holloway Road, London N7 – although surely you must know that address by heart) sent along a couple of their latest mouldings. Although the sizes are far from new – the Drazek 7 x 7½ and Cox 7 x 3½ types – the interesting point is that they are now made from new metal moulds. Apart from ensuring even greater consistency, these moulds should enable Jurgen to produce them quicker so that he can keep abreast of demand! Owners of Super Tigre and similar engines with small diameter shafts will be pleased to know that the hub is now drilled 3/16 in. diameter. Prices are £1.10 each. Henry J. also sent a couple of other items along, both marketed by the American company: *Sonic-Tronics* perhaps better known for their electric starters. Firstly, 'Flite Lite', a special thin-walled silicone fuel tubing designed specifically for fitting through a free flight timer shut-off. Obviously useful to power men, this 24 in. length cost just 32p. The other item was a packet of 'Nifty Pins' which are 'T' shaped pins of 'flat' sections, measuring approx 1¼ in. in length. Ideal for pushing into thick pieces of balsa as there is no danger of the shaft suddenly appearing through your finger tips – as can happen with the glass-headed variety. A pack of 40 costs 24p.

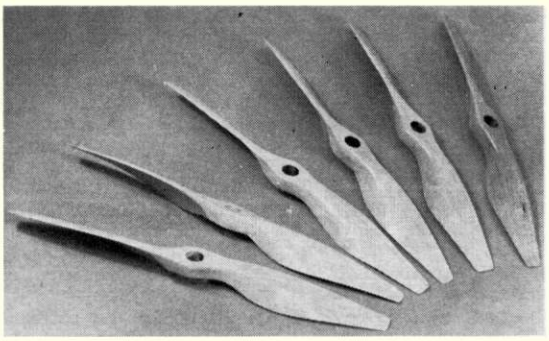
Finally, we come to a selection of **RipMax** 'goodies', which may be obtained via any of their stockists.

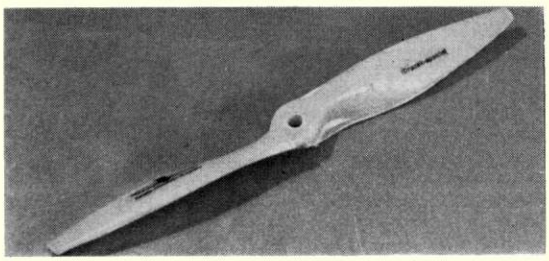
Props too from this source, via **Graupner** and their range of Ahorn wooden items. These are superbly machined, and supplied ready varnished and are supplied in very impressive sealed plastic packs. Sizes are quoted in both millimetres and inches, and most important of all, both normal 'tractor' and *pusher* props are available. The 'normal' props – termed *rechtslaufend* – range in size from 10 x 6 to 12 x 5, while the pusher variety (*linkslaufend*) range from 8 x 4 to 11 x 6. Very useful.

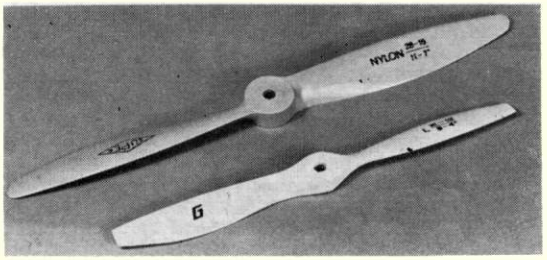
Another **Graupner** propeller range is the 'Super' glass-filled nylon range. Moulded in grey nylon these items have been stiffened by the insertion of glass fibre during the moulding process and are thus presumably safer than conventional nylon props at higher r.p.m. A big range is available here, varying in size from 5 x 2 to 12 x 8 in.

Glider enthusiasts (thermal soarers, too) are catered for by **Graupner** with two spools of nylon tow-line. Choose between a spool of 100 metres of 0.3mm dia., with a breaking strain of 4 Kg, or a 200 metre spool of 0.5mm dia. line with a 10 Kg breaking strain. Much useful advice on tying knots given as well. Prices are 22p and 58p respectively.

A selection of airscrews in a variety of materials! Below, the familiar Bartels glass fibre item, now produced in new metal moulds. Below right, two props from Graupner, the 'Super' glass-filled nylon range and the Ahorn maple wood. Pusher versions of each are available. Right, the MVVS props from Maple Models. These are 180 x 200 mm sizes for team race, but more sizes are available.







CLUB NEWS

IN RECENT MONTHS I have heard two thought provoking opinions on the future of free flight; each in complete contradiction to the other. One argues that, in spite of the growing pressures on existing airfields and open spaces, there are still plenty of sites suitable for free flight purposes, if we only made the right kind of effort to find them. The other opinion tended to accept the inevitability of model flying being contained in shrinking areas of operation; suggesting that only a modified form of free flight would be possible, using radio to keep the model on the lead, as it were.

Personally I enjoy the freedom of flying where and when I like on the open field which free flight gives. At the same time I am not adverse to a spot of Radio Gliding, although I do find the colour code and transmitter pound restrictions somewhat galling. The problems of too much dependance on Radio are obvious enough, I am in favour of keeping all options open as long as possible.

One form of control that does not eat too much open space is control line, and the people who demonstrate that there is still a lot to be had from this style of flying are the **Three Kings Aeromodellers.** Newest addition to their *Court Circular* is a two page spread of photographs, but without, alas, any identifying captions. Featured are many of those super scale models we read so much about, and looking very realistic, too. A shot, there, too, of a Goodyear Racer (why are these rather inelegant models so popular?), and the newsletter carries a report of an event for these machines held back in March. Weather was perfect; calm and sunny, and six teams took the field. Plenty of thrills, spills and drama throughout the day, but nerves were frayed as well as models, for when the two teams lined up for the final came a dispute, and it was left to Derek Bird to go it on his lonesome for the 200 laps, which he completed in 13 mins. 6·3 secs., with five pit stops. Discussed in the newsletter is the naming of models. Aptly enough many are named after birds, not 'Sweetie' and 'Chick' but the feathery kind. One named in this way is *The Bustard,* but would appear to be open to some misconstruction, particularly if the engine failed to start. Perhaps more ethereal is the name *White Spirit* which a member has chosen. Let us hope no one tells him it is another way of describing 'Turps Sub'.

According to Tony Andrews, the P.R.O., of the **Sittingbourne and D M.A.C.,** the club is going from strength to strength. It has now no less than 50 active members. And where do they activate? One place is Straymarsh, which, as the name implies, is a marsh, but not a too boggy one, we trust. What does not stray across the marsh but proceeds with some purpose, is the wind; a chronic feature of the place, or so we glean from the newsletter. The wind, with a chill edge to it, was in attendance at the Spot Landing Competition held in March, but something of the sting was taken out of it by a troop of samaritan Boy Scouts providing hot soup. There were six entries. Graham Lissenden topped the Handicap list and John Ripley the Scratch. Stirring down in the Forest, Ashdown, that is, was an even nastier weight of wind for the first S.M.A.E., Area Event. Stacks of stacking in to take toll of the brave, and just how bad conditions were can be judged from Trevor Grey's winning Open Rubber time of 4 mins. 38 secs., a three flight aggregate. Trevor's win made an encouraging season's opening for Sittingbourne. Seemingly the battered free flighters were impressed at the way the Thermal Soarers mastered the conditions. Made some of them yearn to get old enough to take up the sedentary sport.

Club life is not the cosy all-togetherness that it was in the old days, according to the editorial in the April Bulletin of the **Leicester M.A.C.** One of the problems of the modern club is the lack of cohesiveness that comes of the large 'catchment' areas of today, taking in whole counties rather than local districts. This makes for a somewhat scrappy club life, particularly as many people now join clubs purely for the flying facilities. Not a very satisfying state of affairs to the keen nucleus who look after the club affairs, but that's modern life. Even so, there is evidence of cohesiveness in the Winter Building 'Strip Show'; models exhibited in all their naked glory for the uncovered stage of the comp. In equal first place were the two ends of the flying poles: Mike Pitchers' sleek R/C *Thermal Rider* and Gerry Ferer's open rubber model. There were fifteen entries altogether ranging representatively over the hobby. A good turn out, too, for the A/2 Glider competition in April. Cold and windy, though – nothing like the fab winter weather. Gerry Ferer won this event, too, with a perfect three flight, 150 sec. max., score. A note in the newsletter to the effect that no C/L or towline flying is allowed at Arnesby but OK for radio. Curious.

Fears are expressed in the **Watford Wayfarers** newsletter about all that green belt land the so-called Ministry of the Environment is about to grab off for building. Model flyers who may be operating on bits of unwanted land could well find themselves dispossessed. Could be that the only way to fly in the future will be to take a jet to a Middle East airstrip. It is hoped that this will not cost too much as the club insurance premium has shot up from six to ten pounds.

If you are in favour of the quiet life, without the need of earplugs and the nervous fingering of insurance policies, what better than a combined Chuck and Coupe event to while away a Sunday afternoon? Two such competitions were recently held by the **South Bristol M.A.C.,** according to a report sent to us by P.R.O., Richard Evans. Ten entrants graced the first event, some of whom were lured away from the gyratory delights of the C/L circles. Surprisingly the C/L boys began to dominate the event until Brian Silcox did several maxs in a row to clinch the contest. But it was all C/L for the three in one event, where versatility counts as much as expertise. First part was a sprint start, 30-lap race; next, a simple Stunt schedule: loops, bunts, eights and inverted; and finally, a two-minute Combat joust. Easy enough, you may think, but not with the same model as the rules required. Winner was the one who emerged with the lowest place total, i.e. a third, a second and a second again counting as seven. The idea was well received

again counting as seven. The idea was well received by the Bath club who also entered, making up the total entries to 14. Not bad for a club type event of which two more are scheduled for the season. These, however, will be the only club events due to the pressure of so many national contests. Incidentally, Richard Evans, himself, won that particular event. He goes on to say that new members are welcome at the Black Horse Public House, Old Market Street, Bristol, on the second Friday in the month.

Writing in the **Anglia M.F.C.** newsletter, *High Flyin,* the Chairman, Carl Boswell, was delighted to see a number of free flight and radio models co-habiting on the club's private flying field. He looks forward to the day when a R/C Thermal Soarer and C/L model can be added to the assortment. I can assure him that at least a Radio Glider has put in an appearance since that time. All the rage down at the farm is Pylon Racing (if of a nervous disposition do not read on), and 'Woody' gives a very amusing account of the club's first contest held back in March. He rashly volunteered to do a spot of flagging, and spent most of the time on his knees, ducking and praying. As far as I can see, there are two drawbacks to Pylon, apart from the obvious danger: one is the number of supernumeries you need round the poles, etc., and the other is that human visual capability is not up to the business of gauging the relative position of model to pylon at some two hundred yards removed. 'Woody' also has something to say to those who jib at the higher club fees. He points out, by way of comparison, that a newly opened golf club requires an entrance fee of £180, plus £60 a year membership, not to mention the cost of the little sticks etc. He is, of course, speaking to people who spend a lot of money on the hobby and projects, of which the club fee is a mere fraction, but he should remember that there are a lot of poorer model flyers who like to do a bit within their limited means and do find the higher fees very off-putting.

Main item of news in the April newsletter of the **Hemel Hempstead M.F.C.,** is the proposed visit of six members to Neu-Isenburg for three days. This is on invitation of the Hemel Hempstead Sports Development Council, who will subsidise the visit. Cost will be between £24 and £27 per member; the hosts meeting all expenses other than the fare.

There is an amusing story in the **Flying Druids** newsletter of a S/C radio model going down over the brow of a hill with a locked on rudder. People who went after it were horrified to see an enormous column of black smoke rising from where the model seemed to have crashed. It turned out that the model had come down some five yards from a large bonfire which had just collapsed. Hence the black smoke.

It was not only on this side of the Atlantic that the winter was enjoyed as a bonus extension to the flying season. In Canada, too, there were light winds and sunny days, according to **Toronto F.A.I., Group** newsletter. But as far as we are concerned the quotation heading the newsletter 'April prepares her green traffic light and the world thinks go . . .' is a bit optimistic – a nice return to the winter amber would be welcome. Good weather, though, we hope, for the World Champs in Austria this coming August, and it looks as though a strong contingent will be arriving from Canada, even though the air fare from Toronto is 269 dollars.

More reports and newsletters would be welcome.

Clubman.

Contest Calendar

June 17th	**SOUTH MIDLAND AREA THERMAL SOARING,** 10 a.m. start at Howell's Farm, Halls Green, off B1037 Walkern Nr. Stevenage, map ref. OS 147 285282.
June 17th	**S.M.A.E. INDOOR MEETING** – CANCELED.
June 17th	**FELTHAM C/L RALLY.** Combat, F.A.I. and Goodyear T/R at Charville Lane, Hayes.
June 17th	**MIDLAND AREA F/F MEET.** CANCELLED.
June 17th	**AEROMODELLER SCALE RALLY** at Old Warden, Biggleswade, Beds.
June 24th	**LEEDS GALA.** A/2, Open P/R, HLG, Mini Comp., Vintage Duration, Vintage, Precision, C/L Combat. F/F events start 10 a.m.; C/L 11 a.m. Venue R.A.F. Topcliffe, S.M.A.E. members only.
June 24th	**ST. ALBANS M.A.C. SUMMER GALA.** F.A.I. R/G/P in rounds from 10.30 a.m. Cd'H, A/1, HLG. Venue Chobham Common.
June 24th	**FINCHLEY & DISTRICT M.A.C.'s C/L GALA.** Stunt and Combat at Glebelands, Summers Lane, Finchley, N12. Pre-entry (25p) to J. F. Goodwin, 77 Gallants Farm Road, East Barnet, Herts. Field entry 30p.
July 1st	**COLCHESTER M.A.C.'s 25th YEAR ANNIVERSARY GALA.** F.A.I. Thermal Soaring, R/C Class II Scale, F/F Scramble, C/L Scale, C/L Combat. Venue: The Middle Wick, Mersea Road, Colchester, Essex. Details and pre-entry (essential) 30p to D. Sargant, 17 Old Heath Road. Colchester, Essex.
July 1st	**S.M.A.E. INDOOR MEETING** at Cardington, Bedfordshire.
July 8th	**SECOND WESTERN AREA C/L RALLY.** F.A.I., Goodyear T/R, Combat at R.A.F. Fairford. S.M.A.E. members only; show cards at guardhouse.
July 8th	**S.M.A.E. 4th AREA CENTRALISED MEET.** Team glider, F.A.I. power, Cd'H. Area venues.
July 15th	**S.M.A.E. INDOOR MEET (TEAM TRIALS)** at Cardington, Bedfordshire.
July 15th	**SHUTTLEWORTH MODEL SECTION OPEN DAY.** All F/F and C/L scale and vintage flyers welcome. Gates open 9 a.m. at Shuttleworth Collection, Old Warden, Biggleswade, Beds.
July 15th	**S.M.A.E. CENTRALISED C/L MEET.** F.A.I., ½A and Goodyear T/R, Speed at N. Luffenham, Rutland.
July 22nd	**STOCKPORT COMBAT RALLY.** 40p pre-entry from D. Wood, 16 Norview Drive, East Didsbury, Manchester M20 0QF. Send S.A.E. 60p on day. £10 first prize plus Mainstream Trophy. 10.30 a.m. start. Venue Worth Meadow (off N.2 road on A560 Sheffield Road. ½ mile from Stockport's centre).
July 22nd	**ELLIOT CHAMPAGNE GALLOP** for Class B team racers. Diesel fuels not permitted. Venue Elliot Bros., Airport Works, Rochester, Kent.

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PRESS DATE for August issue, 1973, 20th June 1973.
Private and Trade rate 5p per word (minimum 60p). Box Numbers 25p extra. Display box rate £2.50 per single column inch.
Box replies to be sent care of Advertising Department, P.O. Box 35, Bridge Street, Hemel Hempstead, Herts, England HP1 1EE. Copy received after first post on 18th May will be held over until the next issue, unless cancelled in writing before 15th of the following month. There are no reimbursements for cancellations.

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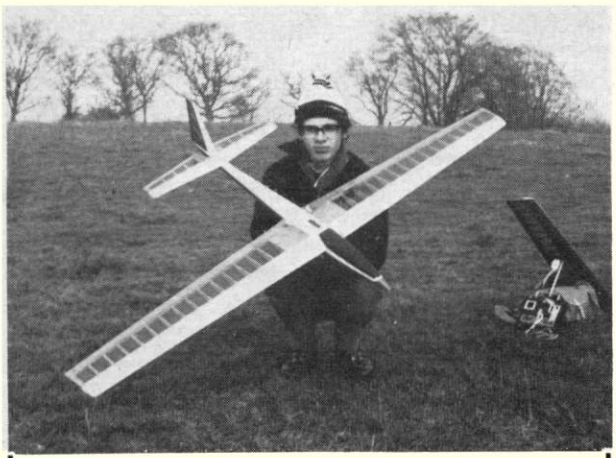

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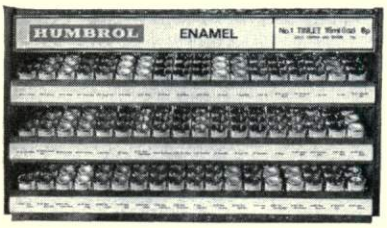

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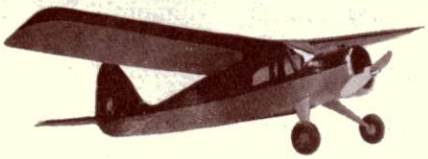

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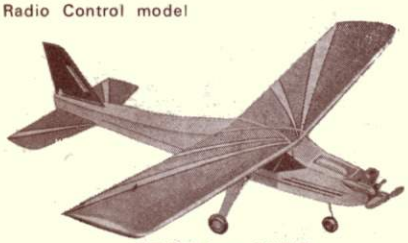

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